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EXAMINING MANAGERIAL PREFERENCES AND CHOICE: THE ROLE OF VALUE CREATION AND VALUE APPROPRIATION DRIVERS IN STRATEGIC OUTSOURCING

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Abstract

A significant volume of research has discussed value creation (total value created in a given relational transaction between two or more firms) and value appropriation (level of value the focal firm captures) as two major components in what managers consider when considering the outsourcing choice. However, scholars have paid far less attention to the trade-offs managers of a focal firm make when they consider the total value that an outsourcing choice creates and the value they expect the firm to capture. In a study of 1,728 decisions made by 72 managers with outsourcing experience, we examine how managers distribute importance (i.e., utility) among these two important value components, and whether or not heterogeneity exists in managerial preference models. Our analysis finds that value creation has a positive influence on the decision to outsource. Moreover, the value appropriation strengthens this relationship when the potential value creation involves a shared investment in resources and capabilities. We also find significant idiosyncrasy in managerial preference models. In several cases, the characteristics of the decision maker explain a large portion of the variance in the decision to outsource.

Keywords: outsourcing decision, micro-foundations, decision making, value creation and value appropriation, heterogeneity, choice experimentation

1. INTRODUCTION

Firms pursuing strategic outsourcing rely on intermediate markets to provide specialized capabilities which have the potential to create value beyond cost economies alone (Contractor et al., 2010; Holcomb and Hitt, 2007; Quinn and Hilmer, 1994). Most studies view outsourcing choices as rational decisions based on economic factors (e.g., Bettis et al., 1992; McIvor, 2009; Walker and Weber, 1984; Williamson, 2008) or resource-based factors (e.g., Holcomb and Hitt, 2007; McIvor, 2009; Quinn, 1999, 2000), and hence argue that these decision-making processes are influenced by the potential for value creation (e.g., cost savings and access to resources and capabilities) in an outsourcing relationship, and the focal firm's ability to capture this value (Mayer and Salomon, 2006; Verwaal et al., 2009). These studies have established that both potential value creation and value appropriation influence strategic outsourcing choices, without going into detail as to the questions of how much each of these value components matters in managerial decisions and whether there exists heterogeneity in these decision models.

In this study, we examine extent to which different relational factors affect managerial choice when considering discrete outsourcing engagement options (i.e., contracts). We view the choice of strategic outsourcing engagement as a function of the value (i.e., utility) managers associate with value creation (total value created in a given outsourcing relationship) and value appropriation (ability of a focal firm to capture value created in a given outsourcing relationship). Specifically, we examine how managers weigh specific value creation and value appropriation factors when choosing among discrete outsourcing options. We also conduct a post-hoc analysis of whether heterogeneity exists in the preference models of strategic outsourcing decision making, and what explains that heterogeneity, should it exist. The post-hoc analysis looks specifically at idiosyncrasy in the preferences managers hold about their choice of organizational governance forms, thereby moving away from firm-based logics to micro-foundational behavioral logics to understand forces that drive managerial choice. While the decision to engage in an outsourcing relationship is made collectively within an organization, individual managers' judgments and perceptions constitute the micro-motor that guides

their judgments about the benefits of outsourcing (Mantel et al., 2006) and coalesce to constitute a collective-level decision about which outsourcing engagement the firm will pursue. Because decision makers often base valuation judgments and choices on idiosyncratic knowledge and preferences, these judgmental decision outcomes can vary across managers (Felin and Foss, 2005; Felin et al., 2012; Foss and Lindenberg, 2013).

We use a utility-based experimental method — discrete choice experimentation (Louviere et al., 2000; Train, 2003) — to untangle the degree to which the different value components influence managerial choices of outsourcing. The experimental methodology permits us to take a fine-grained approach by focusing on the decision models of the individual managers while forcing managers to make trade-off in their choices which reflects more realistic business decision-making situations compared to the traditional Likert survey based approaches. The orthogonal design used in our experiment allows us to look at the effect of each value components separately, thereby avoiding confounding effects related to correlations that naturally exist amongst the components of a decision. The use of a Bayesian approach to covariance estimation enables us to examine whether individual managers consistently put high value on these well-known outsourcing drivers, and, if heterogeneity exists, what contributes to explain this variance.

Our empirical approach leads to four primary contributions. First, this study contributes to our understanding of the role of value creation and value appropriation in strategic outsourcing decision making (see Leiblein, 2003; Verwaal et al., 2009) by examining how value appropriation interacts differently with different value creation components in outsourcing choices. Second, while a plenty of research has look into outsourcing choices, less has empirically examined individual variance in outsourcing choices. Our post-hoc analysis specifically examines the idiosyncrasy in individual decision models through Bayesian analysis, which allows us to extract unexplained variance that cannot be captured by an error term. In response to calls for studies on micro-foundational issues (Devinney, 2013; Foss and Lindenberg, 2013), we also explain how the variance in individual- and firm-level characteristics can result in *variance in preference models* for managers making simulated

discrete outsourcing choices, providing a deeper understanding of when and why the choice of outsourcing relationship are likely to be heterogeneous. Third, by utilizing structured experimental methods and Bayesian estimation, we move beyond a focal emphasis on the development of generalized singular model of choice to one aimed at capturing and explaining individual level variance in the decision model used by managers. Finally, a combination of experimental discrete choice modeling and Bayesian econometrics potentially opens up a new avenue for the examination of the micro foundations of strategy. To date, most work in applying micro-foundational thinking applies behavioral logics but has yet to coalesce around an appropriate and accepted set of methodologies that link theory to proof in a structured and direct manner (see, e.g., Devinney, 2013).

2. DECOMPOSING STRATEGIC OUTSOURCING DECISIONS

We conceive strategic outsourcing choices as being a combination of what potential value — including both value brought in by the outsourcing provider and value created through complementary resources and capabilities — can be created in a relationship, and whether a focal firm can capture value in an efficient way from an outsourcing engagement. Managers are maximizing the combination of the size of the pie (i.e., value creation) and the fraction of the pie they can get (i.e., value appropriation). The mainstream outsourcing literature suggests two types of outsourcing: tactical outsourcing, which focuses intensively on cost savings, and strategic outsourcing, which concerns value beyond cost economies. Assumptions about the value firms expect an outsourcing engagement to generate drive this classification.

The first type of value created in an outsourcing engagement is the economic value from cost savings, which is a focus of tactical outsourcing. Cost advantages from outsourcing arise from outsourcing provider's superior efficiency in performing such activity at lower costs and in a shorter time (Barney, 2001; Peteraf, 1993). According to this view, outsourcing reflects a firm's efforts to operate more economically by leveraging on provider's resources and capabilities.

The second type of value is intangible, non-financial value (e.g., knowledge, innovation), which is often a main focus of strategic outsourcing. This research stream considers outsourcing as a strategic tool to leverage non-financial value potential from valuable specialized resources and capabilities beyond a firm's boundary (Holcomb and Hitt, 2007; Quinn, 2000; Quinn and Hilmer, 1994). We argue that strategic value from outsourcing may emerge from two possible sources: (1) an outsourcing provider's resources and capabilities, or (2) shared resources and capabilities of both an outsourcing firm and a provider. Specifically, an outsourcing engagement gives a firm an access to valuable external resources and capabilities (of an outsourcing provider) that are not available within a firm. Firms may also benefit from a synergistic value (Dyer and Singh, 1998), which is created from complementary resources and capabilities in an outsourcing engagement.

Research has also examined the role of value appropriation in outsourcing decisions. According to TCE, the risks of opportunism and bounded rationality are a major component of transaction costs and pose a serious threat to parties in cross-boundary transactions (Williamson, 1985, 1991). While value appropriation is rather straightforward in a full ownership arrangement, the absence of ownership or direct control in an outsourcing transaction raises the question of how value appropriation can be enforced (Verwaal et al., 2009), especially in the case of innovation (Arrow, 1962; Schumpeter, 1934; Teece, 1986), where future value is uncertain and difficult to predict ex-ante. We discuss below a model of strategic outsourcing decisions based on a value creation and value appropriation perspective (see Figure 1 for the summary of the conceptual model).[1]

Insert Figure 1 about here

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[1] While we recognize there are a large number of variables that can influence this decision, we choose to focus on specific variables that represent different types of value creation (economic value vs. strategic value beyond cost economies) and value appropriation components. The objective of this study is to examine how managers make trade off among these value components and whether there is heterogeneity in their preference models. Other factors not specified in the model are treated as controls through the experiments' scenario. We validated these value components through interviews with managers with high involvement in outsourcing decisions.

2.1. Value Creation Potential in Outsourcing

2.1.1. Economic Value from Cost Savings

Outsourcing decisions from the RBV perspective are often driven by two key criteria: the level of specificity or scarcity required to obtain resource and capability in the external market (Argyres, 1996) and the cost of developing such resource and capability or of acquiring them from other firms that possess them (Barney, 1991). More specifically, when the costs of using hierarchy are high a firm will adopt a non-hierarchical structure to obtain such resources and capabilities. In this respect, resources and capabilities critically underlie outsourcing choices because obtaining ownership may require significant costs. RBV, hence, concludes that firms should obtain resources and capabilities that can be traded through the market to avoid an investment that is unlikely to result in any competitive advantage (Gilley and Rasheed, 2000). Accordingly, cost-based economics, as a consequence of effective governance structures and the competitive advantage from firms' unique resources and capabilities, represent important criteria in outsourcing engagement selection. Consistent with prior studies, we expect the value these cost savings create to affect the choice of outsourcing options.

2.1.2. Strategic Value beyond Cost Economies

The ability to access new and valuable capabilities is a critical driver of strategic outsourcing because these actions can fundamentally alter a firm's capability endowments (Morrow et al., 2007). Strategic value in an outsourcing relationship includes: (1) the benefits attributed to resources and capabilities of outsourcing provider[2], and (2) the benefits attributed to resources and capabilities shared by the firm and its outsourcing provider, referred to as relational rents (Dyer and Singh, 1998).

[2] The value from outsourcing provider's resources and capabilities might be similar to those discussed in the provider selection studies (see, for example, Sarkis and Talluri, 2002; Schiele, 2006; Verma and Pullman, 1998). However, in this study, we look at a broader decision of outsourcing engagement selection, which involves both value an outsourcing provider can offer and value that requires the contribution of both parties as well as ability of an outsourcing firm to capture these values.

2.1.2.1. Value from the Provider's Resources and Capabilities

The first strategic value from the provider's resources and capabilities emerges from the provider's ***motivation to innovate***. Firms considering outsourcing benefit from such governance structure when it allows them to enrich and extend their knowledge stock, tap into specialized capabilities and fill voids in their endowment (Mowery et al., 1996; Steensma and Corley, 2000; Weigelt, 2009). The intrinsic motivation in the outsourcing provider arises from the centrality of the specific outsourced task(s) to the provider and task-focused motivation (Sternberg and Lubart, 1991, 1993), and encourages the provider to invest its effort and resources in the target work domain. This also generates an incentive to innovate (Alexander and Young, 1996), because the link between task improvement and rewards becomes increasingly apparent. A competitive marketplace also adds powerful incentives for outsourcing providers to innovate continuously in order to gain market share (Baldwin and Clark, 2000; Brown et al., 2002; Domberger, 1998). The natural forces of competition encourage providers to find new niches where they can differentiate themselves from their rivals. This value from the outsourcing provider's motivation offers a strong incentive for firms to consider outsourcing as a way to create or sustain performance advantages in the market. Hence, we expect to observe a positive relationship between a provider's motivation to innovate and outsourcing engagement decision.

The second value component arising from the resources and capabilities of outsourcing providers is ***task specialization.*** By serving many clients with similar needs, outsourcing providers are more likely to make specific investments to build up capabilities in their specialized domain. Task specialization arises because of access to sufficient human and organizational resources (e.g., the increased size of knowledge base (Ahuja and Katila, 2001)) and the buildup of specialized capabilities (e.g., a firm's absorptive capacity (Cohen and Levinthal, 1990)). It allows outsourcing providers to achieve an efficient degree of specialization, which yields increased innovative output. Because this specialized knowledge is difficult to articulate and costly to transfer (Polanyi, 1958; Teece, 1998), firms may acquire access to these valuable — yet specialized — capabilities via their outsourcing

engagements (Azadegan and Dooley, 2010; Holcomb and Hitt, 2007). The heterogeneity of the knowledge bases within a firm along its value chain (Ghemawat and Costa, 1993) thus determines the gains from task specialization. So, in a real sense, "managerial diseconomies of scope" result from differences in the requisite capabilities and styles of each segment (Richardson, 1972). These managerial diseconomies drive the latent gains from specialization, which, in turn, create the need for an intermediate market to emerge, as well as for it to determine the extent to which trade affects the creation and appropriation of value in a given market (Jacobides and Hitt, 2005). Consequently, we expect task specialization of an outsourcing provider to pose a positive effect on strategic outsourcing choices.

The third value component is ***knowledge diversity***. The efficient exploitation of the diverse knowledge base of outsourcing providers results from knowledge reapplication and recombination (Alavi and Leidner, 2001; Majchrzak et al., 2004). The diversity of knowledge and skills is a powerful predictor of innovation and value creation because it brings useful and differing perspectives together (Chesbrough, 2003; Cohen and Levinthal, 1990; Hargadon and Sutton, 1997; Paulus, 2000; Sutton, 2001; West, 2002). However, organizations often do not possess adequate diversity of knowledge and skills to innovate in all the necessary functions, while outsourcing providers, who serve many clients facing various challenges in different industries, are more likely to recombine a range of knowledge and experience and apply them to generate innovative products and processes for other clients or industries. An outsourcing engagement will become a preferred option when it offers the potential to extend a firm's innovation scope beyond internal resources and outstrip the knowledge endowment of an individual firm (Mol and Kotabe, 2011). Accordingly, we argue that value from outsourcing provider's knowledge diversity has a positive effect on the choice of outsourcing options.

2.1.2.2. Value from Shared Resources and Capabilities

Inter-firm complementarity is the value arising from those resources and capabilities shared by both the firm and its outsourcing provider**.** Many strategy scholars have argued that firms may enhance their value chain performance when they align with exchange partners in order to access

complementary capabilities (Araujo et al., 2003; Arora and Gambardella, 1990; Cassiman and Veugelers, 2006; Mudambi and Tallman, 2010; Rothaermel, 2001; Teece, 1986). The relational view (Dyer and Singh, 1998) suggests that firms can develop valuable resources by carefully managing relationships with external entities, and that the complementarity of internal and external resources and capability allows firms to generate greater rents than the sum of those obtained from the individual resources of each partner. When an outsourcing engagement can provide access to such complementary capabilities, it becomes an important source of innovation (Clegg et al., 2005), and, hence, a strong incentive to choose a strategic outsourcing engagement (Araujo et al., 2003). Thus, we argue that inter-firm complementarity has a positive effect on the choice of outsourcing options.

2.2. Value Appropriation Capability of Outsourcing Contracts

As firms increasingly use external relationships to acquire new knowledge and support their innovation and value creation activities, it is important that they develop a capability to govern these relationships. Value appropriation risks are particularly critical for outsourcing, compared to other forms of inter-firm relationship (e.g., alliance), simply because of the relinquishment of the control of assets and the opportunism in arm's length relationships. Exchange hazards (i.e., asset-specific and environmental uncertainty) are detrimental to market efficiency because they lead to increasingly complex contractual relationships and, hence, increase ex-post transaction costs (Barthelemy and Quelin, 2006; Grimpe and Kaiser, 2010; Williamson, 1991). Verwaal et al. (2009) show that risks for value appropriation (i.e., asset specificity and switching costs) pose a negative influence on outsourcing decisions. To avoid, or at least mitigate, these risks, firms need mechanisms to protect the potential values and manage risks that might arise in an engagement. One such widely discussed mechanism is the degree to which corporations can draw up reasonably efficient outsourcing contracts (Barthelemy, 2003; Cao and Lumineau, 2015; Gopal et al., 2003; Handley and Benton, 2009; Harris et al., 1998; Lumineau and Quélin, 2012; Mayer and Argyres, 2004; Saunders et al., 1997) that aid in governing the relationship with its outsourcing provider, and ensure that value created in the

relationship can be effectively captured. We, hence, argue that an outsourcing firm's capability to appropriate value from an outsourcing relationship has a positive effect on its choice of outsourcing options.

2.3. Interaction between Value Creation and Value Appropriation

In addition to the direct effect of value appropriation capability, we argue that the moderating role of value appropriation is prevalent when value creation potential involves strategic value, which is more difficult to monitor and capture as compared to economic value from cost savings, where firms can extract value via a more complete market. Despite the fact that outsourcing engagements hold the potential to create value, there are no guarantees that a firm will capture all or even a portion of the gains from an outsourcing engagement. Hence, we argue that a focal firm's capability to capture the value outsourcing engagements create positively moderate the relationship between value creation drivers and managerial choice of an outsourcing engagement option.

As we distinguish between value generated from an outsourcing provider's resources and capabilities and value generated from shared resources and capabilities, value from provider's resources and capabilities (i.e., motivation, task specialization and knowledge diversity) requires no firm investment on resources and capabilities. On the other hand, value from inter-firm complementarity requires both parties in a relationship to bring resources and capabilities to the table (Dyer and Singh, 1998; Dyer et al., 2008). It is the uncertainty in the size of the pie created that poses the risk, which becomes even greater as the investment in shared resources and capabilities increases. Hence, the adverse effect of opportunism and the lack of value appropriation capability is expected to be greater when the value is created by a synergy of internal and external resources (Dyer and Singh, 1998), or when external resources enhance internal resources (Argyres, 1996; Kogut, 2000).

When outsourcing involves a complicated relationship involving a shared investment in resources and capabilities, the allocation of rents becomes ambiguous, pressuring the firm to focus more heavily on their capability to capture the return on their investment efficiently (Lumineau and

Quélin, 2012). Under such conditions, firms are more sensitive to the efficient value appropriating mechanism when value from inter-firm complementarity is expected. More specifically, we predict that the moderating effect of value appropriation on the value arising from inter-firm complementarity will be stronger as compared to its moderating effects on the other types of value creation, which involve only resources and capabilities of an outsourcing provider.

3. METHODS

3.1. Research Participants

We identified a sample of managers and executives involved in outsourcing decision making using the 2009 membership database of the International Association of Outsourcing Professionals (IAOP), a global consortium of leading companies involved in outsourcing as customers, providers, or advisors. Managers that are members of IAOP play an active role in outsourcing for the firms they represent. From this database, we randomly selected a subsample of the executives and senior managers with experience in outsourcing decision making to contact for interviews. Sixteen executives and senior managers agreed to participate in our semi-structured interviews, which sought participants' opinions about factors underlying their outsourcing engagement selections, outcome expectations and experience with successful and unsuccessful outsourcing engagements. These interviews allowed us to ensure the external validity for our experimental instruments and pretest the model of strategic outsourcing decision making discussed earlier. We also used the findings from these interviews to derive attributes, levels, and experimental scenarios used in the experiments.

After the initial interviews, we contacted 1,500 members of the IAOP via email and requested their participation in the experiment. One hundred and ninety-eight IAOP members (response rate of 13.2%) agreed to participate in the first experiment (known as a best-worst experiment and explained shortly). Approximately three months later, we conducted a second survey of the original pool of 198 managers; seventy-two managers agreed to participate in the follow-up experiment (known as a discrete choice experiment and explained shortly). These managers were familiar with outsourcing,

held senior positions in their organizations (with the median levels between a respondent and CEO of 3), and had led or participated on a team responsible for at least one outsourcing engagement, with 57 percent having more than 6 years of experience in outsourcing decision making. These managers represented a balanced cross-section of large multinational firms and small- to medium-sized firms from a variety of different geographic locations and industries, with a median firm size of approximately 5,000 employees.[3]

3.2. Research Variables

Dependent variable. The dependent variable is the manager's choice of a preferred outsourcing option (value of 1 when the respondent selected a preferred outsourcing option and value of 0 otherwise) among potential outsourcing options (i.e., two options in DCE, see Figure 2). Figure 2 shows an example of DCE choice tasks and will be explained in the next section. We asked managers to make outsourcing choices while we manipulated the level of variables to observe how each factor poses different effects on managerial choices and how managers traded off among these variables.

Insert Figure 2 about here

Decision attributes. The explanatory variables (i.e., decision attributes) include the six value components discussed earlier (see Figure 1). To facilitate respondents completing the experimental task, we rename some theoretical outsourcing factors discussed earlier so that they were expressed in terms managers use regularly and understand. Despite the variation in the name, the meanings remain the same as what we discussed earlier in the theoretical section. To ensure a common, accurate understanding of the meaning of factors we prompt every respondent with the definition of decision attributes (as shown in Table 1) prior to outsourcing decision tasks and throughout the experiment. During our interviews, we identified two additional environmental factors that managers suggested had an impact on their choice of outsourcing option—the directionality of a to-be-outsourced activity

[3] Due to page limitation, the detail on sample characteristics is omitted in this article but available from the authors upon request.

(i.e., customer-facing or backroom operation) and the risks associated with an outsourcing engagement. As a result, we included these two factors as control variables in the outsourcing scenarios that we associated with the experimental task. In other words, they are higher-level experimental manipulations that we varied across individuals. The detail on discrete choice task and outsourcing engagement decision scenarios (i.e., how managers were instructed to complete the choice tasks) are further described in Appendix A. Table II lists the six attributes included in the experimental task and their levels.

Insert Table I and II about here

3.3. Research Task and Experimental Design

Untangling the weight distribution of value components and capturing heterogeneity in managerial preference models of outsourcing decision making are challenging because variation in the decision weights must be examined while ensuring that the decision context and variables underlying outsourcing decisions remains constant. In this study, we use stated-preference (SP) experimental methods, which provide flexibility in the construction of realistic business decision-making scenarios and the ability to disentangle decision factors that may be difficult to capture in surveys or conventional panel datasets. In the current case, the SP method is uniquely appropriate because we are investigating potential benefits and expected value appropriation capability as well as potential relationships that may not naturally occur in the market, and hence, be the bases of an econometric examination using panel data (which clearly do not exist). Controversially, most strategy and management research has been limited to the traditional methods that do not allow us to disentangle complex decisions.[4]

[4] The SP method has been found useful in the studies of judgment and decision making — especially in the marketing, transportation, and health economics fields, where the conventional revealed-preference (RP) data do not exist for new products or new public transportation modes and routes (Ben-Akiva and Lerman, 1985; Chen and Hausman, 2000; Hensher, 1994). The SP approach could also be useful in many other fields where analysis of behavior and decision making is limited to the quality of RP data (Whitehead et al., 2008). It is relatively new to strategy and management, but has increasingly gained recognition and popularity (Anderson et al., 2011; Brazell et al., 2005; Buckley et al., 2007;

In this study, we applied two SP experimental methods to examine managerial choice of different strategic outsourcing models. We first used best-worst scaling (BW) experiment (Flynn et al., 2007; Louviere, 1991; Marley and Louviere, 2005) to extract comparable scales and ranking orders of value components. The findings from the BW experiment give us a broad idea of the relative significance of value components, which allows us to focus on the most relevant value components and, hence, keep the main experiment at a manageable size. We summarized the results of our BW experiment in Appendix A. The main experimental method applied is the discrete choice experiment (DCE) (Louviere et al., 2000; Train, 2003). DCE, with a theoretical basis in random utility theory (McFadden, 1973; Thurstone, 1927), allows us to examine both direct and interaction effects of each value component on outsourcing selection.

We based the design of the DCE on the orthogonal fractional factorial design (Street and Burgess 2004, 2007; Street et al. 2005), which allowed us to use an orthogonal design (i.e., testing no correlation between variables) to estimate the main effects of each value components and moderating effects between value appropriation capability and value creation components. In the DCE, we placed each respondent in one of two outsourcing situations: the outsourcing of a customer-facing operation or the outsourcing of a backroom operation. We controlled the level of risk associated with the outsourcing engagement and held the level of risk constant in both outsourcing scenarios by indicating "the outsourcing decision being made represents a relatively large investment …" in each scenario (see Appendix B for further detail on decision situations). As shown in Figure 2, we instructed respondents to make decisions about 24 outsourcing engagement pairs with varying levels across the six value components by indicating which of the options: (1) "would be their most preferred" and (2) they would "recommend to their firm's board of directors" with a "none" option. These two decisions are akin to asking the manager a "consideration set" question and "forced-to-choose" question. In this

Haynie et al., 2009; McMullen and Shepherd, 2006; Patzelt and Shepherd, 2008; Priem et al., 2011; Robert Mitchell et al., 2011; Venkatesh et al., 2012).

sense, the choice from question (2) generates individuals' consideration set individuals that would include the forced-to-choose choice from decision (1).

4. RESULTS

4.1. Discrete Choice Model Aggregate Sample Results

To estimate the probability of a manager choosing each outsourcing engagement, we employed the multinomial logit (MNL) model (Train, 2003) (see Appendix C for more detail). Table III presents the results from series of MNL analyses on responses from the DCE. The dependent variable is the choice of the outsourcing engagement possessing the focal factor levels, as represented by Question 1 (see Figure 2); in other words, a selected option, which is a manager's most preferred strategic outsourcing engagement, will be valued 1, otherwise, valued 0. Each respondent made 24 (choice sets) × 2 (options) = 48 choices, nested within choice sets of two. Model 1 in Table III reveals that each of the six value components has a direct and meaningful impact on outsourcing option selection. As expected, an outsourcing provider's motivation to innovate ($\beta = 0.338$, $p < 0.001$) has a significant positive influence on outsourcing engagement selection. The results also show that both inter-firm complementarity ($\beta = 0.313$, $p < 0.001$) and value appropriation capability ($\beta = 0.314$, $p < 0.001$) have a statistically significant effect on firms' choices of outsourcing engagement. In line with the result from the BW experiment and prior studies, economic value from cost savings is another important factor underlying outsourcing engagement selection ($\beta = 0.291$, $p < 0.001$). Interestingly, although cost saving is traditionally considered the focal incentive for an outsourcing engagement, we found that its relative effect was smaller than value from motivation, inter-firm complementarity, and value appropriation (0.291 compared to 0.338; 0.313 and 0.314)[5]. Outsourcing providers' knowledge diversity and task specialization were the two factors with the smallest effect size on outsourcing

5 The effect of cost savings is significantly smaller than that of value for motivation. However, the difference between the effect of cost savings and that of inter-firm complementarity and value appropriation is not statistically significant. Please refer to Appendix D for the full results of the test for significance of differences among coefficients.

choices. While knowledge diversity ($\beta = 0.029$, $p < 0.01$) had a significant, though small, positive effect, task specialization[6] ($\beta = -0.097$, $p < 0.001$) had a negative effect on an outsourcing decision.

Insert Table III about here

To examine the interplay between value creation and value appropriation components, Model 2 includes interaction terms between value appropriation and the four value creation factors. The result illustrates the significant positive moderating effect of value appropriation on the relationship between inter-firm complementarity ($\beta = 0.055$, $p < 0.001$) and outsourcing choices, implying that firms are cognizant of their potential ability to appropriate value from the complementary investment of internal and external resources and capabilities they have made in their outsourcing engagement. The moderating effect of value appropriation capability on knowledge diversity ($\beta = -0.033$, $p < 0.001$) and task specialization ($\beta = -0.033$, $p < 0.01$) are significant, although the estimates are small and negative, suggesting the slight attenuating effect of value appropriation on the positive effect of knowledge diversity, and the negative effect of task specialization on outsourcing choices. The result, however, shows insignificant estimates of the interaction between value appropriation and value from motivation ($\beta = -0.017$, p = n.s.).

The interaction between value appropriation and inter-firm complementarity is significantly larger in size than other interaction terms (see Appendix D). This finding provides an interesting implication, suggesting the more certain managers are about their capability to appropriate the value created in an outsourcing relationship, the more willing they are to take into account the shared investment in complementary resources and capabilities when choosing an outsourcing engagement.

4.2. Post-Hoc Analysis: Heterogeneity in Strategic Outsourcing Decisions

While the aggregate results offer insights about the relative significance of each value component and their interplay in an outsourcing selection model, they do not allow us to identify

[6] It should be noted that all variables were effect coded (with -1 or +1) in our analysis and, hence, reverse coding for industry specialization (as opposed to knowledge diversity) is not an issue here.

whether there are different preference profiles in the sample. One of the fundamental precepts of modern strategic thinking is that firms survive and persist because of the underlying heterogeneity in their assets and capabilities (see, e.g., Penrose, 1959; Richardson, 1972). Indeed, much of strategy research is focused on discovering the sources of this advantage. From our perspective, there is considerable evidence of a lack of consistency in strategic decision making (Eisenhardt and Zbaracki, 1992; March and Heath, 1994), which arises not just from firms operating in different environments (Bourgeois, 1984), but also from the differences in capabilities that emerge from differences in managerial intentionality and managers' perception of feasible strategic paths (Nelson, 1991).

The mainstream strategy literature points out that variation at the micro (i.e., actor-specific) level serves as a fundamental source of the heterogeneity in strategic decision making at the organizational level. In their plea for providing micro-foundations in the field of strategic management, Felin and Foss (2005) argue that individuals matter and that micro-foundations are needed for explanation in strategic organization. In particular, micro-foundational thinking suggests that the sources of heterogeneity are rooted in the characteristics of individuals who make path-dependent decision (Felin and Foss, 2005; Felin et al., 2012). Strategic decision-making processes are shown to be influenced by the decision maker's prior knowledge and experiences (Barr et al., 1992; Walsh, 1995), the organizational context in which they are embedded (Kaplan, 2008; Ocasio, 1997; Simon, 1947), and the nature of the environment itself (Nadkarni and Barr, 2008). This line of argument suggests that we should come to expect considerable heterogeneity in manager's decision models and outcomes.

Our principle focus in the post-hoc analysis is on two issues. First, we examine the heterogeneity in the relative significance of value creation and value appropriation components in strategic outsourcing choices across individuals and argue that there exist more than one preference models (i.e., how individual managers distribute weight among value components) operating in outsourcing decisions. While both academics and practitioners identify economic value from cost savings as the most attractive feature of outsourcing engagements, we observe a significant number of

cases where firms place more importance on other value components of the engagement (e.g., strategic value beyond cost savings, ability to capture value created in a relationship). It is the heterogeneity in the set of factors underlying outsourcing engagement selection and the weighted distribution among these factors that is our main interest.

Together, individual-level data collected from experiments and estimates of individuals' parameters derived from the Bayesian estimation allows us to estimate individual models of outsourcing choices and reveal the potential heterogeneity in these strategic decisions across managers. More specifically, we utilized a hierarchical Bayes (HB) estimation approach with a normal prior for respondents' preferences, $N(\bar{\beta}, D)$ where D is the variance of $\bar{\beta}$ across individuals. Table IV provides the results of HB analysis with the means of the estimated individual parameters and their overall heterogeneity. Taken together, these results are consistent with the results of our DCE analyses that we discussed previously, and demonstrate that considerable variability exists in managers' strategic outsourcing preferences.

Insert Table IV about here

Second, we examine whether we could provide a preliminary model of heterogeneity based on the characteristics of the decision makers and/or their organization. To do this we regressed each value component's coefficients for each individual on individual- and firm-level covariates using weighted least square (WLS) regression where an inverse of variance, $1/D$, of each estimated coefficient was applied as a weight for WLS. In this study, we focused on three groups of covariates: (1) the decision maker's characteristics (i.e., report levels to CEO, industry experience, and outsourcing decision-making experience), (2) a firm's operating industry, and (3) its headquarter location.

Insert Table V about here

Table V provides the WLS regression results. Of the six value components, individual- and

firm-level covariates did not influence managerial preferences for cost savings and value from motivation. The results also show that decision makers from some industries placed significantly stronger value on task specialization and knowledge diversity. More specifically, managers/executives from mining and natural resource extraction (β = 3.824, p < 0.1), transportation (β = 2.870, p < 0.01), financial services (β = 2.223, p < 0.01), and manufacturing (β = 1.943, p < 0.01) valued task specialization more highly than their peers, while those from pharmaceuticals/biotech (β = 3.844, p < 0.001), healthcare/education/social services (β = 1.502, p < 0.1), and financial services (β = 0.985, p < 0.1) allocated a significantly higher value to knowledge diversity in their selection of strategic outsourcing engagements. This result suggests an interesting implication that decision makers from financial services, by far one of the biggest and most sophisticated user of outsourcing services, focus on both knowledge depth and breadth (i.e., task specialization and knowledge diversity) of their outsourcing contractors as well as synergistic value from an outsourcing engagement (discussed next).

The results further suggest that there is heterogeneity in the preferences for inter-firm complementarity across decision makers' seniority and firms' operating industries. In particular, high-level executives — i.e., CEO (β = 1.089, p < 0.1) and executives with two levels report to CEO (β = 1.075, p < 0.01) — placed a significantly higher value on potential inter-firm complementarity when making their strategic outsourcing decisions. This is consistent with prior studies arguing that outsourcing is viewed as a strategic tool by the top management team, while being mostly perceived as an operational quick fix by front-line managers (e.g., Heijiman et al., 2008). A firm's operating industry also accounts for variance in managerial preference for inter-firm complementarity; decision makers from mining/natural resource extraction (β = 3.087, p < 0.01), government/NGO (β = 2.683, p < 0.01), utilities/construction (β = 1.515, p < 0.1), and financial services (β = 1.021, p < 0.1) strongly valued inter-firm complementarity in their strategic outsourcing choices.

Managerial preferences for value appropriation vary considerably in the represented model. Most of the heterogeneity in value appropriation (R^2 = 0.594) is amenable to ex-ante characterization of the decision makers and firms. With the exception of headquarter location, the results indicate that

the covariates in our model explain a significant majority of the variance in managerial preference for value appropriation. Interestingly, C-suite executives revealed a significantly stronger preference for value appropriation in their strategic outsourcing choices (β = 0.876, p < 0.01). However, CEOs themselves valued the capability to capture potential benefits in strategic outsourcing engagements significantly less than their subordinates did (β = -1.670, p < 0.001). In other words, CEOs indicated that they are willing to rely less on a formal contract (Poppo and Zenger, 2002) to appropriate value from their outsourcing relationships. Furthermore, value appropriation mattered less for decision makers with extensive industry and outsourcing decision-making experience. Why this might be the case is not clear, except perhaps that those managers with more outsourcing experience know better how to structure arrangements to capture value, and hence, need to rely less on clearly stated legal guarantees. In terms of industry effects, the results reveal that managers/executives from mining/natural resource extraction, transportation, and utilities/construction expressed less concern over the issue of value appropriation in their strategic outsourcing choices. This could be because the nature of provider relationships in these industries is more trust based and long-term oriented compared to others.

Variation in strategic outsourcing decisions is particularly crucial, because these choices are often long-term strategic commitments that are difficult to reverse (Hoetker, 2005; Novak and Stern, 2008). More broadly, variance in strategic decision making reflects an attempt to adapt to changing environmental conditions (Hogarth and Makridakis, 1981), and hence, may be reflective of heterogeneity in the firm's overall strategy. In line with the microfoundations perspective, the findings from our post-hoc analysis suggest that a set of value components that managers take into account when selecting outsourcing engagement, and how managers distribute the weight among these value components in their decision calculus, depend not only the individual's and firm's resources and capabilities, but remain fundamentally idiosyncratic to a specific manager.

Insert Table VI about here

To further compare unique variation explained by each group of covariates, we ran a hierarchical regression, adding individual-level covariates (i.e., report levels to CEO, industry experience, and outsourcing decision-making experience) and then firm-level covariates (i.e., headquarter location and operating industry). Table VI shows the adjusted R squared for each model. The results are consistent with what we see in Table V. Headquarter location offered a very minor, if not no, explanation about the variance in the outsourcing choices across all outsourcing value components. None of the covariates provides an important contribution to the variance in how managers value cost savings in their outsourcing selections. The results further suggest that a large part of variance in value appropriation, task specialization and inter-firm complementary is captured by differences in a firm's operating industry. Interestingly, decision-maker level covariates collectively explain 61.6% of the variance in value from motivation and adjusted R squared dropped after adding in headquarter location (*adj* R^2 = 0.411) and operating industry (*adj* R^2 = 0.196) variables. This further supports our argument that the managers' choices of strategic outsourcing engagement are not homogeneous and that not only organizational factors but also decision maker's characteristics influence managerial choice. More broadly, our finding suggests that while firm-level covariates explain a large part of variance in strategic outsourcing decision-making, we should not ignore the role of characteristics of decision-makers, which contribute to decomposing the heterogeneity in a number of the value components

5. DISCUSSION AND CONCLUSION

In this study, we examine the degree to which managers consider value creation compared to value appropriation in their selection of strategic outsourcing engagement, and, through the post-hoc analysis, whether heterogeneity exists in managers' outsourcing engagement preference. By integrating both the value creation and the value appropriation dimension of outsourcing decision making, our study sheds light on the relatively limited extant studies of how managers distribute the weight among various value components in their outsourcing choices. Our experimental and Bayesian

approach, conducted on the actual practicing managers, also allows us to examine the decision models of the individual managers making these outsourcing choices.

Our major conclusion is that an outsourcing firm's value appropriation capability has a significant moderating effect on value creation components. This effect is particularly strong when the potential for benefits attributed to resources and capabilities are shared between a focal firm and its outsourcing provider. The effect is less significant when the potential value is more certain and requires no shared resources (e.g., a provider's task specialization and knowledge diversity). Specifically, when the focal firm expects to invest in a relationship involving shared resources and capabilities (Dyer and Singh, 1998), it has a stronger incentive to capture the return on the investment (i.e., value created in a relationship), thereby placing a greater significance on the value appropriating mechanism (e.g., the contract). The significant direct effect of value appropriation also implies that managers do not simply expect beneficial gains from an outsourcing engagement, but they are strongly cognizant of the realization of these potential new value benefits. The results from both experiments are consistent in showing that although cost savings are viewed as a "have-to-have" in outsourcing choices (e.g., Kremic et al., 2006; Welch and Nayak, 1992), managers do not overlook the potential for value creation beyond cost savings (also observed by Mudambi and Venzin, 2010). Managers also expect to leverage their providers' strong motivations to innovate and gain access to external capabilities and resources that are complementary to their in-house operations through an outsourcing relationship. This is reflected in industry practice, where many firms attempt to develop a long-term partnership with their outsourcing providers, rather than simply engaging in a one-off transaction.

Our findings lend broad support to the proposition that there exists heterogeneity in the preference models of strategic outsourcing decisions, suggesting that different decision makers assess each value component differently. While almost all empirical studies in strategy apply fixed effect controls, such as industry-level and firm-level variables. Our results extend this research by revealing that this approach may not pick up meaningful heterogeneity at the level of the decision maker

(Devinney, 2011). As illustrated in our findings, in some cases, heterogeneity in the model of strategic outsourcing decisions is explained largely by micro-level factors. For instance, our results also indicate that strategic value components beyond cost savings (such as inter-firm complementary and value appropriation) show a considerable variation in their utility value across decision makers. In speculating the theoretical explanation for this finding, we note that variances in the preference for strategic value components potentially imply differences in decision makers' goals and level of sophistication in the outsourcing engagement. For instance, higher-level executives with a sophisticated view of outsourcing engagements are more likely to view outsourcing as part of strategic management practice, and hence consider strategic value components differently from middle-level managers, who focus more on operational efficiency. This further contributes to extant outsourcing decision-making research: that the argument for a bandwagon effect in outsourcing decision making might not be applicable to more strategic outsourcing choices, which tend to be idiosyncratic across decision makers and organizations.

5.1. Limitations and Future Research Directions

We recognize that there are limitations in our study. First, while our findings tease out some of the factors explaining the variance in strategic outsourcing choices using individual- and firm-level covariates, our recruitment of the sample does not allow us to analyze the firm and industry fixed effects in general as we did not sample to do this. Hence, our attempt to examine heterogeneity in strategic outsourcing choices is exploratory in nature. While it hints at the importance of individual level managerial heterogeneity, understanding what may be driving that heterogeneity would require a study designed specifically to decompose the heterogeneity.

Second, our analysis is restricted to a limited set of value creation and value appropriation components that were contained in the experimental model. This restriction was necessary in order to keep the size of experiments manageable for participants. However, we did ensure that the most relevant value creation and value appropriation components were included and did this based on

information from intensive interviews and prior studies in outsourcing choices. Due to the complex nature of outsourcing decision making, many other alternative factors could involve and influence outsourcing choices. Being aware of this issue, we attempted to control for these alternative explanations through carefully set up scenarios and the inclusion of control variables in the experimental design. However, the challenge lies in the fact that including additional criteria is likely to increase the amount of variation found. The amount of variation within this small sample encourages future research to overcome this limitation by improving on, or complementing, our empirical approach.

Third, our attempt to examine the role of value appropriation in outsourcing choices is limited to an outsourcing firm's perspective. Value appropriation addresses the question of how each party to the contract captures a share of the total value created: an increase in a firm's value appropriation comes at the expense of the provider's value appropriation. Hence, the issue of value appropriation is not entirely determined by the focal firm but also dependent on the provider. While recognizing that outsourcing providers could affect the share of value appropriation, the DCE only allows us to look at the effect of value appropriation from one side at a time. Hence, one avenue for future research is to examine the ex-ante role of value appropriation in outsourcing choices from providers' perspective. Scholars could examine this phenomenon by applying direct economic bargaining experiments.

Finally, since the DCE is based on random utility theoretic thinking, and could suffer from biases in the model used by respondents, external validity might be limited. For instance, if managers suffer from overconfidence bias (Camerer and Lovallo, 1999) or are using decision models that the experiment was not designed to investigate, the findings may have less predictive validity. In addition, our experiments did not account for managers' fiduciary responsibilities. Hence, it is not possible to know how the outsourcing choices made in the experiments would translate into a firm's final decision in reality, where the situations are more complex and have additional factors that come into play. Nevertheless, the convergence validity of DCE has been tested in several occasions (see, for example, Hensher et al., 1999; Louviere and Woodworth, 1983; Telser and Zweifel, 2007), causing Louviere

(1988) to conclude that DCE constitute a valid instrument for explaining and predicting individual behavior on actual markets.

5.2. Contributions to Theory and Practice

This research has direct implications for managerial practice and research in outsourcing decisions and, more broadly, strategic decision-making processes, especially those examining heterogeneity and inconsistency in strategic decision making. Our findings contribute to extant outsourcing decision-making research in that they highlight how managers strategically distribute value (i.e., utility) among value creation and value appropriation components in their outsourcing choices, which reflects the real decision-making situation in which managers are constrained by alternatives and forced to make trade-off in their choices. The results further highlight a significant ex-ante role of value appropriation on strategic outsourcing decisions. Although most studies in the literature focus on the ex-post effect of value appropriation capability and a contract in governing and managing an outsourcing relationship (e.g., Argyres and Mayer, 2007; Barthelemy and Quelin, 2006), we show that the role of value appropriation is much broader. In an environment where joint investment is required (indeed it may be the norm when more "core" resources and capabilities are involved), a focal firm's capability to ensure efficient value appropriation is significant in itself (it has a direct effect) and, at the same time, manipulates the effects of potential values on outsourcing choices (it has moderating effects).

By explaining variance in strategic outsourcing choices, we are among the early attempts to explore the sources of heterogeneity in the preference model of outsourcing decisions. While both research and popular press have unraveled the complex set of factors underlying outsourcing selection based on industry characteristics (e.g., outsourcing choices made by pharmaceutical and biotech companies are more likely to be driven by intangible economic value components compared to those made by manufacturing companies), our analysis suggests, that in many cases, the heterogeneity resides at the individual-level. The micro-foundations approach taken in this study enhances our

theoretical understanding of strategic outsourcing selection by outlining micro-mechanisms and highlighting the need to consider the idiosyncrasies at the level of the decision maker. Consistent with a micro-foundational logic, we argue that empirical research is needed to validate and extend our understanding of factors that characterize variance in the preference model of managers.

Another implication derives from the use of DCE methodology in this research. In response to management scholars' call for a rigorous research approach for evaluating organizational strategy (see, for example, Bartunek et al., 2006; Vermeulen, 2005), DCE provide an efficient and comprehensive approach for understanding and examining idiosyncratic demand and complex decision making underlying outsourcing choices. In addition, forced-choice trade-offs provide more opportunities for creating incentive compatible scale instruments than Likert-based surveys. A difficulty in studying the ex-ante role of the value appropriation capability and potential value creation which may not naturally appear or which may be difficult to observe in the real market is how to get individuals to reveal their preferences about what they would favor in realistic circumstances. In this case, it is difficult to effectively capture innovation benefits and value appropriation using the revealed preference approach. Choice experimentation is a good alternative, because the variables the study investigates are not clearly measured in the market and panel data about them is difficult or impossible to obtain.

Insights into the various models of strategic outsourcing selection can be obtained from the use of HB analysis, which provides an alternative way to capture unobserved heterogeneity and other potential sources of variability in much richer detailed than the results obtained from the tradition econometric approaches. The study also benefits from a semi-parametric specification of HB approach, which frees researchers from possibly strong or unwarranted distribution assumptions about individual heterogeneity. Based on the empirical evidence here, the HB model offers an attractive specification. As such, this work should be viewed as an early attempt of an exciting methodological path for strategy and management researchers and practitioners (see, for example, Hansen et al., 2004). We encourage a greater effort to use Bayesian methods for a more sophisticated interpretation

of discrete choice models and seeking to further our understanding of heterogeneity in strategy and management research. The potential for re-examining existing management theories using experimental methods and Bayesian approaches should be recognized as a means of improving theoretical understanding and modern management practice.

In addition, our approach linking experimentation with HB modeling opens up a potential avenue for a methodology that can serve as the basis of future work on the micro-foundations of management. The experimental logic allows researchers to focus on the decision calculus that they are applying, while HB permits us to examine individual level variation in that calculus. Future research can takes this from the individual level to the group level and there is nothing econometrically stopping us from building multi-level Bayesian models that account for unobserved sources of heterogeneity at the level of both the manager and the firm.

In closing, our findings yield useful advice for managers and firms facing strategic outsourcing decision making. Firms are increasingly reconfiguring their boundaries and focusing on the highest value adding activities while outsourcing decisions become more heterogeneous. Our findings suggest that managers should carefully consider the interdependencies between potential value creation and value appropriation in their outsourcing choices. In particular, managers should have a clear vision of their outsourcing goals and apply their judgment policies accordingly (e.g., those looking to leverage on value-added rents from inter-firm complementarity might want to focus more on value appropriation issue in their outsourcing engagement selections). As such, the explicit study of how managers strategically trade off among value components in outsourcing choices could be a useful tool for understanding the different strategic goals of outsourcing and predict outsourcing trends. In this spirit, we hope this study becomes part of a growing body of evidence and theory, with concrete implications for practice.

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7. TABLES AND FIGURES

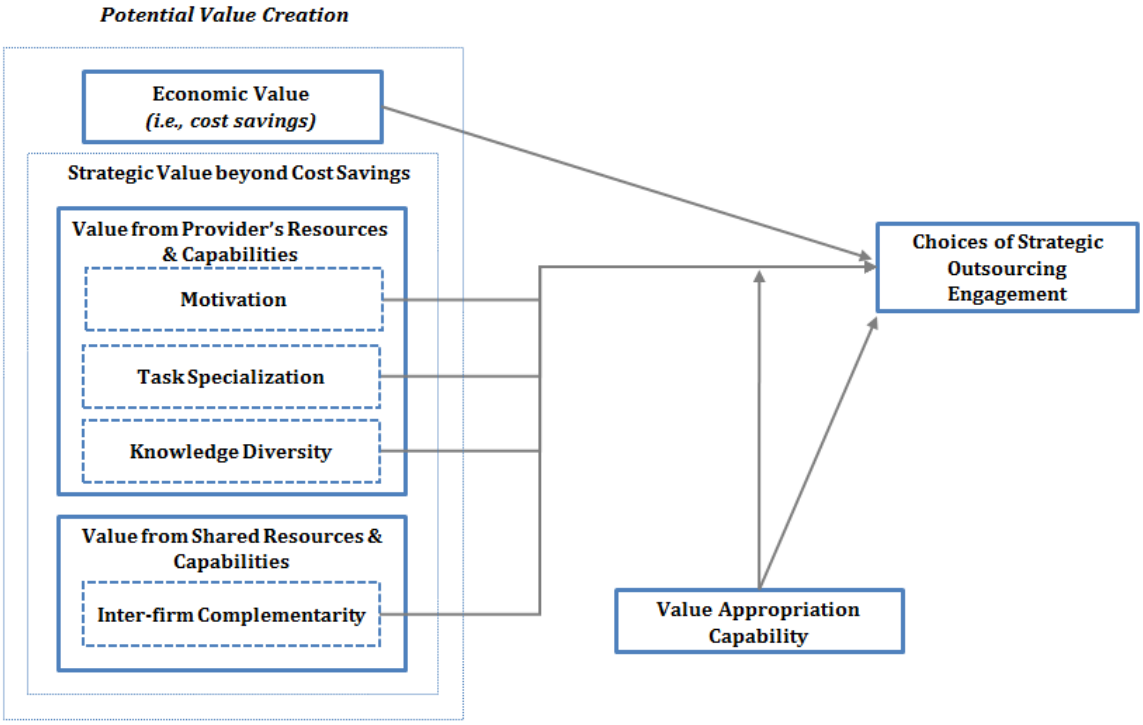

FIGURE 1

A Model of Strategic Outsourcing Decision Making

Outsourcing Factors	Option A	Option B
Task Specialization	Offers a range of services	Offers one specific service
Industry Specialization	Provides services within one industry sector	Provides services within one industry sector
Commitment to Innovation	High commitment to innovation	Low commitment to innovation
Value Creation	10% increase in value	10% increase in value
Value Capture	25% value captured	25% value captured
Cost Savings	Decrease 20% or more	Decrease 10% or less

Q1. Which outsourcing option is your MOST preferred? (Tick one)	◉ Option A	○ Option B
Q2. Which option, if any, would you recommend to the Board of Directors for further consideration? (Tick one)	○ Option A ○ Both A and B	○ Option B ◉ Neither

FIGURE 2

Example of the Discrete Choice Experiment

TABLE I
Outsourcing Attribute Definitions

Decision Attributes	Name shown in DCE	Definition provided in DCE
Value Creation: Economic Value		
Economic Value from Cost Savings	Cost Savings	"Cost savings" are how much your organization saves by outsourcing an activity to an external operator compared to the cost of an in-house operation. They are measured by the percentage decrease in the cost incurred in performing an activity after it has been outsourced.
Value Creation: Strategic Value		
Value from Provider's Resources and Capabilities		
Value from Motivation	Commitment to Innovation	"Commitment to innovation" states how much your outsourcing provider is committed to improving existing products, services, or processes or creating new products, services, or processes.
Task Specialization	Task Specialization	"Task specialization" is the degree of expertise of your outsourcing provider in a particular task. Think of it as the number of different business functions your outsourcing provider provides to the marketplace.
Knowledge Diversity	Industry Specialization	"Industry specialization" is the degree of knowledge diversity your outsourcing provider has across industries. Think of it as the number of different industries your outsourcing provider serves.
Value from Shared Resources and Capabilities		
Inter-firm Complementarity	Value Creation	"Value creation" is the extra value created from the combination of knowledge and capabilities of the parties (i.e., your company and the outsourcing provider) involved in an outsourcing engagement. One can think of it as the percentage of value increase after an activity has been outsourced to an outsourcing provider.
Value Appropriation		
Value Appropriation Capability	Value Capture	"Value capture" is how efficient your outsourcing contract is in allowing you to gain value created in an outsourcing relationship. Think of it as a ratio of value gained to total value created from an outsourcing activity as a percentage.
Controls*		
Directionality of Activity	Customer-facing or Backroom Services	"Customer-facing or backroom services" describe whether the outcome of this activity has a direct exposure to customers. The operation of customer-facing services has a direct exposure to customers, while backroom services involve activities that provide support to customer-facing operations and hence do not have a direct exposure to customers.
Risk	Risk	"Risk" describes the extent of the uncertainty associated with an outsourcing activity in terms of cost, quality and provider failure.

** Directionality of activity and risk are included as control variables in the experimental scenarios

TABLE II
Outsourcing Attributes and Levels Used in the Discrete Choice Experiment

Attribute	Attribute Level	
	Low	*High*
Economic Value	Decrease 10% or less (low cost saving)	Decrease 20% or more (high cost saving)
Value from Motivation	Low commitment to innovation	High commitment to innovation
Task Specialization	Offers a range of services (low task specialization)	Offers one specific service (high task specialization)
Knowledge Diversity	Provides services across industry sectors (low industry specialization)	Provides services within one industry sector (high industry specialization)
Inter-firm Complementarity	0% increase in value (no value creation)	10% increase in value (high value creation)
Value Appropriation	25% value captured (low value capture)	75% value capture (high value capture)

TABLE III
Aggregate DCM Experiment Results (Multinomial Logit)

	Model 1			Model 2		
Outsourcing Attribute	coeff.		s.e.	coeff.		s.e.
Value Appropriation	0.314	***	(0.02)	0.314	***	(0.02)
Cost Savings	0.291	***	(0.01)	0.292	***	(0.01)
Value from Motivation	0.338	***	(0.01)	0.339	***	(0.01)
Task Specialization	-0.097	***	(0.01)	-0.098	***	(0.01)
Knowledge Diversity	0.029	**	(0.01)	0.028	**	(0.01)
Inter-firm Complementarity	0.313	***	(0.01)	0.314	***	(0.01)
Interactions						
Value Appropriation × Value from Motivation				-0.017		(0.01)
Value Appropriation × Task Specialization				-0.033	**	(0.01)
Value Appropriation × Knowledge Diversity				-0.033	**	(0.01)
Value Appropriation × Inter-firm Complementarity				0.055	***	(0.01)
McFadden's R^2	0.221			0.224		
LL	-7,865.68			-7,846.11		
Number of Respondents	72					
Number of Total Choice Tasks	1,728					

** $p < 0.01$, ** $p < 0.01$, *** $p < 0.001$*

TABLE IV
Individual Choice Estimates of Strategic Outsourcing Decisions (Hierarchical Bayes)

Attribute	Level	Base	Mean			Heterogeneity		
			coeff.	z-value		coeff.	z-value	
Value Appropriation	75% value capture	25% value capture	5.251	2.877	**	6.379	1.844	*
Cost Savings	Decrease 20% or more	Decrease 10% or less	3.865	4.603	***	8.243	2.473	**
Value from Motivation	High commitment to innovate	Low commitment to innovate	4.032	6.644	***	6.042	1.923	*
Task Specialization	Offer one specific service	Offer a range of services	-0.193	-0.189		6.941	2.616	**
Knowledge Diversity	Provide services within one industry sector	Provide services across industry sectors	1.323	1.246		3.954	2.714	**
Inter-firm Complementarity	10% increase in value	No synergetic value	3.561	3.552	***	5.280	1.869	*
Value Appropriation × Value from Motivation	Low commitment to innovate, 25% value capture		-2.262	-2.456	**	7.334	1.929	*
	Low commitment to innovate, 75% value capture		0.145	0.177		5.977	1.005	
	High commitment to innovate, 25% value capture		0.873	1.184		5.400	1.088	
	High commitment to innovate, 75% value capture		1.243	0.905		15.591	2.286	*

*$p < 0.1$, **$p < 0.01$, ***$p < 0.001$

TABLE IV (Cont)
Individual Choice Estimates of Strategic Outsourcing Decisions (Hierarchical Bayes)

Attribute	Level	Base	Mean			Heterogeneity		
			coeff.	z-value		coeff.	z-value	
Value Appropriation × Task Specialization	Offer a range of services, 25% value capture		2.555	1.524		6.607	1.783	*
	Offer a range of services, 75% value capture		-3.788	-2.153	*	7.706	1.646	*
	Offer one specific service, 25% value capture		2.582	1.238		6.930	1.985	*
	Offer one specific service, 75% value capture		-1.349	-0.757		16.723	1.835	*
Value Appropriation × Knowledge Diversity	Provide services across industry sectors, 25% value capture		-6.114	-3.890	***	6.250	1.636	
	Provide services across industry sectors, 75% value capture		3.851	2.851	**	5.890	1.126	
	Provide services within one industry sector, 25% value capture		-5.136	-4.521	***	4.222	1.808	*
	Provide services within one industry sector, 75% value capture		7.399	5.063	***	9.587	2.270	*
Value Appropriation × Inter-firm Complementarity	10% increase in value, 25% value capture		-1.518	-0.911		7.035	1.382	
	10% increase in value, 75% value capture		0.981	1.192		7.511	0.788	
	20% increase in value, 25% value capture		0.489	0.628		5.577	1.721	*
	20% increase in value, 75% value capture		0.049	0.030		16.574	1.488	
Hit Rate (percent correctly predicted)		0.992						
Log Marginal Density		-153.09						

** p < 0.1, ** p < 0.01, *** p < 0.001*

TABLE V
Impact of Individual- and Firm-level Covariates on Heterogeneity (WLS)

Covariate	Value Appropriation	Cost Savings	Value from Motivation	Task Specialization	Knowledge Diversity	Inter-firm Complementarity
Report Levels to CEO						
0 (I am a CEO)	-1.670***	-0.563	0.664	0.169	-0.013	1.089*
1 level	0.876**	0.906	0.538	0.114	0.459	-0.144
2 levels	0.079	0.560	0.265	-0.236	0.388	1.075**
3 levels	0.351	0.652	-0.009	-0.816	0.104	0.594
4 levels or more				*Reference Level*		
Industry Experience						
1–5 years				*Reference Level*		
6–10 years	-1.901**	-0.718	0.407	-0.322	-1.053	1.908
11–15 years	-1.485*	-1.034	-0.642	-0.539	-0.895	1.736
16–20 years	-1.567*	-0.516	-0.640	0.112	-0.553	1.700
21–25 years	-2.367**	-2.983	0.684	0.303	-0.675	1.217
More than 25 years	-0.804	-0.103	-0.771	-0.417	-0.497	1.226
Outsourcing Decision-Making Experience						
0 year				*Reference Level*		
1–5 years	-2.704***	-3.133	1.608	1.243	-0.072	0.507
6–10 years	-2.611***	-4.177*	2.171*	0.531	-0.186	0.430
More than 10 years	-2.610***	-3.213	1.268	0.540	-0.411	0.855
Headquarter Location						
Africa				*Reference Level*		
Asia	0.508	-4.028	-1.037	1.877	1.329	-0.152
Australia/New Zealand	0.886	-2.778	-0.420	0.000	1.161	0.110
Europe	-0.446	-4.025	-1.058	1.981	1.464	1.443
North America	0.082	-4.277	-0.556	0.503	1.276	0.398
South America	0.737	-2.281	-2.023	0.460	0.553	-0.544
Industry						
Others				*Reference Level*		
Utilities/Construction	-1.406**	-0.894	0.484	0.313	0.419	1.515*
Transportation	-2.721***	-0.391	-0.473	2.870**	0.652	0.657
Pharmaceuticals/Biotech	-0.479	0.196	-1.560	2.555	3.834***	-1.175
Business Services	0.671	0.053	0.160	-0.285	-0.184	-0.274
Health Care/Education/Social Services	-0.020	0.716	-1.574	0.131	1.502*	1.495
Financial Services	-0.533	0.805	-0.443	2.223**	0.985*	1.021*
Mining/Natural Resource Extraction	-3.130***	-1.446	0.480	3.824*	0.692	3.087**
Manufacturing	-0.408	0.617	-1.554**	1.943**	0.637	0.322
Retail/Wholesale Trade	-1.918	2.426	0.529	1.933	1.615	1.146
Information Technology	-0.676	-0.072	0.027	1.357	0.231	0.510
Government/NGO	-0.452	0.394	-2.032	-0.017	0.109	2.683**
Constant	-7.844***	-11.07**	-3.753*	2.175	-0.419	-1.190
Observations	73	73	73	73	73	73
R squared	0.594	0.308	0.509	0.542	0.395	0.479
Adjusted R squared	0.335	-0.132	0.196	0.251	0.010	0.147

*$p < 0.1$, **$p < 0.01$, ***$p < 0.001$

TABLE VI
Changes in Adjusted R squared*

Outsourcing Attribute	Covariates included: *Report Levels to CEO*	*Industry Experience*	*Outsourcing Decision-Making Experience*	*Headquarter Location*	*Industry*	Adjusted R squared	Change in Adjusted R squared
Value Appropriation	x	x	x			0.056	
	x	x	x	x		0.018	-0.038
	x	x	x	x	x	0.335	0.317
Cost Savings	x	x	x			-0.011	
	x	x	x	x		0.023	0.034
	x	x	x	x	x	-0.132	-0.155
Value From Motivation	x	x	x			0.616	
	x	x	x	x		0.411	-0.205
	x	x	x	x	x	0.196	-0.215
Task Specialization	x	x	x			-0.116	
	x	x	x	x		0.096	0.212
	x	x	x	x	x	0.251	0.155
Knowledge Diversity	x	x	x			-0.103	
	x	x	x	x		-0.140	-0.037
	x	x	x	x	x	0.010	0.150
Inter-firm Complementarity	x	x	x			-0.036	
	x	x	x	x		-0.009	0.027
	x	x	x	x	x	0.147	0.156

*Coefficient estimates and detailed results are available upon request.