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Andrew Whinston
University of Texas at Austin

Anitesh Barua
University of Texas at Austin

Deepa Mani
University of Texas at Austin

CONFLICT RESOLUTION OR INFORMATIONAL RESPONSE? AN EMPIRICAL ANALYSIS OF THE DETERMINANTS OF GOVERNANCE CHOICE IN BUSINESS PROCESS OUTSOURCING RELATIONSHIPS

Deepa Mani, Anitesh Barua and Andrew Whinston
McCombs School of Business,
University of Texas at Austin,
1 University Station, B6500,
Austin, TX 78712

Abstract

This study integrates perspectives from neo-institutional economics, organization theory and information systems to examine why firms choose different governance structures across business process outsourcing (BPO) relationships. In particular, we focus on the information processing (IP) requirements that must be managed during the course of the BPO relationship and antecedent uncertainty in the business environment, outsourced business process, and BPO relationship that influence governance choice through their impact on such IP requirements. Further, we theorize that the influence of IP requirements on governance choice is moderated by the choice of technological capabilities. Survey data on 130 BPO initiatives provide empirical support for our hypotheses. Our results emphasize that in modern information intensive BPO relationships, hierarchical controls embedded in the governance structure are an important IP mechanism that helps the user firm effectively respond to IP requirements of the relationship and resolve incentive and cognitive conflict between the participant firms.

Keywords: Business Process Outsourcing; Uncertainty; Information Requirements; Governance

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Introduction

Business process outsourcing (BPO) refers to the transfer of the management of one or more *information intensive* business process to an external provider, who, in turn, owns and administers the selected process(es) based on specific performance criteria. BPO is the fastest growing segment of the outsourcing market[1], and represents the latter's maturity from a cost saving tool for transaction intensive business processes to a flexible and powerful strategy for business transformation (Linder 2004). This increased diversity of outsourcing objectives has been accompanied by an allied increase in the diversity of relational structures used to realize these objectives, emphasizing the multitude of complex choices that user firms face in structuring the BPO relationship (Gottfredson et al. 2005; Linder 2004). This study develops a model of governance choice that helps user firms identify and manage the complexity in organization of BPO arrangements. It examines some of the factors, both exogenous and endogenous to the BPO initiative that impact the formal structure used to govern it.

Consistent with prior research (Gulati and Singh 1998; Leiblein et al. 2002; Williamson 1991), we define the governance structure as the formal contract used by participant firms to formalize the BPO relationship. The neo-institutional economics literature primarily[2] distinguishes among formal contracts in terms of the level of hierarchical control that they embody. Given that the flow of control follows the structure of the hierarchy, integrative outsourcing structures such as joint ventures or minority equity alliances, comprising the hierarchical end of the spectrum, are marked by relatively greater levels of control than long-term and arms length contracts.

The study of outsourcing governance choices has largely been dominated by transaction cost economics (TCE) (Williamson 1975, 1991) which views hierarchical control as a mechanism to address exchange hazards in the outsourcing relationship and yield collectively beneficial outcomes. The exchange hazards stem from uncertainty perceived by the user firm about its relationship with the provider, and usually arise in situations where there are large amounts of surplus to be divided ex post, and in which it is costly to write a complete contingent contract ex ante that specifies a clear division of this surplus or in which contractual monitoring and enforcement pose major challenges. In such case, the adoption of few hierarchical controls engenders risks of moral hazard and hold-up. Hierarchical governance structures provide an integrative framework for work and decision making that helps adjudicate differences, overcome individual conflicts of interest, and facilitate effective ex post adaptation. Conversely, the potential effects of adopting a more hierarchical governance structure when uncertainty and allied exchange hazards are low include loss of flexibility and decision making speed. Thus, TCE posits that the level of hierarchical control in the governance structure must be discriminatingly aligned with the exchange hazards in the BPO relationship (Leiblein et al. 2002; Pisano 1990)3. The greater the exchange hazards, the more integrated must be the exchange or the more hierarchical must be the nature of the governing contract.

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[1] According to IDC, the worldwide BPO market is expected to grow from $405 billion in 2003 to $682.5 billion in 2008. By 2008, the use of external technology and business process services is likely to move from a 2005 average of 12% of the corporation's total costs to 20% of total costs. Forecast growth rates for BPO are 10-15% per annum (in contrast to 7.1% for technology infrastructure and application outsourcing).

[2] While transaction cost economics focuses on constraints to ex post adaptation and distinguishes among contracts in terms of hierarchical control, the property rights literature focuses on constraints to ex ante investments and distinguishes among contracts in terms of residual rights of control that provide incentives for such investments. However, in this study, we focus on constraints to ex post adaptation and adopt the transaction cost conceptualization of formal contractual structures.

[3] This logic was originally examined in the case of the make-buy-ally decision or rather, the decision to outsource. However, it has since been extended to study the choice of governance structure once firms decide to outsource or form an alliance (for example, Gulati and Singh 1998).

This study develops the argument that the above TCE framework for representing and explaining governance choice must be extended to recognize significant changes in businesses that have occurred over the past decade. Rapid advances in communication and technology have given rise to highly information intensive firms, defined by frequent turnover in the information embodied in products and processes, and acquired by customers and competitors. Consequently, the ability to communicate and process new information and ultimately translate this information into decisions has emerged as an important source of firm competitiveness (Glazer 1999; Mendelson and Pillai 1998). In turn, the outsourcing of information intensive business processes is increasingly motivated by the need to enhance the information processing (IP) bandwidth of the user firm rather than by a sole reduction in transaction costs. The ensuing reduction in information overload allows the firm to focus limited information capacity on distinctive competences (Hult et al 2004) and enhance firm competitiveness. This viewpoint is reflected in emergent research (Siggelkow and Levinthal 2003; Sinha and Van de Ven 2005), which emphasizes that outsourcing forms might be best viewed as complex work systems in which the user firm is a niche node[4] as opposed to a nexus of contracts.

This study finds that the shift in outsourcing motivation impacts the traditional transaction cost model of governance choice in important ways. First, it shifts attention on the basis of BPO governance choice from relational uncertainty and allied exchange hazards to a more holistic model of IP requirements that must be managed during the course of the relationship. Few empirical studies have analyzed IP requirements as a basis for the design of hierarchical controls in outsourcing governance structures. This study addresses this issue to introduce IP requirements as an important influencer of governance choice in modern outsourcing relationships.

Further, we integrate theories of IP (Galbraith 1973) with TCE to posit that the IP requirements of the BPO relationship stem from the user firm's informational response to uncertainty, both endogenous and exogenous to the outsourced task environment. In particular, the IP requirements of the BPO relationship are influenced by uncertainty in: the business environment, relationship with the service provider, and outsourced business process. The simultaneous effect of these variables has received scant attention in prior empirical research on adaptation in vertical relationships. Economic theories of organization emphasize cooperation conflicts from relational uncertainty while organizational theories argue that organizational design must be responsive to environmental and task uncertainty. Further, organizational theories have largely focused on intra-organizational coordination although responsiveness to task and environmental uncertainty is critical for effective inter-organizational adaptation.

Finally, the above theoretical arguments point to the mediating effect of IP requirements of the BPO relationship on governance structure. Prior research in TCE assumes a direct relation between relational uncertainty and governance choice. The mediating effect of IP requirements suggests that compared to cooperative mechanisms that resolve incentive conflict, hierarchical controls in governance structures might well be superior IP mechanisms that facilitate informational response to changes in the BPO task environment. The strength of the relationships between the explanatory dimensions of uncertainty, IP requirements, and governance choice is examined in light of the possible moderating effect of technological capabilities of the BPO relationship.

The empirical testing of our hypotheses uses survey data on 130 active BPO relationships. In addition to its theoretical contribution to the literature on governance of outsourcing relationships, the study also addresses the concern that there is little empirical research that incorporates the distinctive nature and form of BPO. Rouse and Corbitt (2006) draw attention to the paucity of empirical research on BPO - they find that during the period 1980 to June 2005, only 11 scholarly or peer reviewed articles reported empirical research on BPO. They lament that "the absence of independent empirical research means that decision makers choosing whether to outsource a business process have to proceed on faith" (Rouse and Corbitt 2006). Our study, in explaining the factors that underlie user firms' choices from the multitude of BPO relational structures available to formalize the relationship, yields insights into the unique nature and form of BPO relationships.

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[4] This view of the user firm is best represented by the business models of a new class of "function-based companies" that extensively leverage BPO to concentrate scale and skill on a single function. These include UPS in logistics management, Solectron in contract manufacturing and Hewitt Associates in human resources management (Gottfredson et al. 2005). This view is also manifest in the transition of BPO to a flexible and powerful strategy used to achieve diverse strategic objectives ranging from innovation to speed-to-market to organizational change.

Theory and Hypotheses

IP Requirements as a Governing Principle

The significance of IP requirements to the design of hierarchical controls has been primarily emphasized in the organization of activities within a firm. The IP view of the firm (Galbraith 1973) characterizes organizations as IP networks with limited information processing capacity (or bounded rationality) that are faced with different levels of uncertainty or contingencies in their business and task environments. This school of research (Child 1977; Daft and Lengel 1986) posits that hierarchical controls are superior information processing mechanisms that ensure effective communication and integration of effort between members of a firm so as to respond effectively to the presented contingencies. The right structural design or level of hierarchical control facilitates the right amount of information need to cope with uncertainty and achieve desired task performance.

This study extends the above tradition of research to the inter-organizational context and emphasizes its salience to the context of BPO in particular. The outsourced business process in BPO is *information-intensive* (Aundhe 2003; Aron and Singh 2003) in that the primary inputs and outputs of the outsourced process are business information (Glazer 1999), and the successful execution of the process requires information coordination between process workers. Given the relatively greater frequency of change in business information, BPO relationships may involve more *uncertainty* and *ambiguity* on an ongoing basis than other outsourcing projects. This, in turn, creates larger volumes of information that need to be processed and translated into decisions (Daft and Lengel 1986) in the BPO relationship. In addition to the information exogenous to the outsourced task environment, information endogenous to the relationship between the user firm and the service provider must also be managed during the course of the BPO relationship. This primarily comprises information exchanged to overcome cognitive limitations and develop a shared understanding of outsourced tasks and interdependencies required for process management and execution. Diverse views of task concepts such as quality and performance standards need to be resolved for effective task execution. In an organization, culture and affiliation enable members to develop shared meanings (Gioia and Thomas 1996) required for efficient work design. However, since participant firms in the BPO relationship are affiliated with different organizational cultures, information fills this key role to foster shared meanings. Information must also be processed in the relationship to enhance organizational understanding of the partner firm's culture, discern mutual adjustments in behavior, and foster mutual trust in the relationship.

The significance of providing the right amount of information to the right actor at the right time in the BPO relationship provides the foundation for our expectation that the governance structure of the relationship is more than a cooperative mechanism that addresses *incentive conflict* and allied exchange hazards; it is an information processing mechanism that provides the necessary bandwidth to additionally address IP requirements borne of *cognitive conflict* and issues in *work design*. Glazer's (1993) seminal work on information intensive firms acknowledges this possibility that as the traditional exchange hazards pertaining to appropriability or scale diminish in information intensive vertical relationships, the inherent attributes of information, and not necessarily exchange hazards, will dictate the structure through which the process operates:

> *"Physical-based commodities, which are appropriable, scarce, and display decreasing returns to use, lead to concerns with boundaries, ownership, and allocation. Information-intensive firms, on the other hand, recognize that information, which is neither appropriable, nor scarce, and which displays increasing returns to use, results in the breaking down of boundaries and leads to accessing, sharing, and creating opportunities for use. Many of the organizational structure and strategic changes that have been identified as crucial to success in the changing business environment follow directly from an appreciation of this fundamental shift in perspective …" (pg 108)*

This viewpoint is consistent with emergent research in organization and strategy that points to the complementarity between the contractual and relational structures in vertical relationships (Gulati et al. 2005; Poppo and Zenger 2002). Yet, these studies do not detail the specific role of the governance structure in coordinating actions between participant firms. This study seeks to fill this gap in the literature through the study of governance choice in BPO as an information response to contingencies in the outsourced task environment.

Hierarchical Control in BPO Governance Structures

Prior research (Stinchcombe 1985; Gulati and Singh 1998) details various hierarchical controls that underlie the contractual structures governing vertical relationships. These include both *coordination mechanisms* such as

command structures and authority systems, operating procedures, dispute resolution procedures that align actions and *cooperative mechanisms* such as incentive and pricing systems that align incentives (Gulati and Singh 1998). A governance structure is hierarchical to the extent that the hierarchical elements it incorporates "replicate the control and coordination features associated with organizations, which are considered to be at the hierarchical end of the spectrum" (Gulati and Singh 1998). Thus, BPO governance structures in decreasing order of hierarchical control range from equity sharing structures such as joint ventures to arm's length contracts marked by competitive bidding that have few hierarchical controls built into them.

We posit that that hierarchical control in the governance structure helps participant firms contend with numerous information states in several important ways. First, through the mutual allocation of tasks, responsibilities and contingent actions, these controls guide, legitimize, and reinforce information flows between participant firms. Operating and dispute resolution procedures are akin to rules and programs in organizations or habits in individuals (Galbraith 1973) that provide a memory for handling situations, thereby, rendering interactions more predictable and mitigating the levels of communication and decision making that contribute to the IP requirements of the BPO relationship. For example, in their qualitative study of contracts in the personal computer industry, Mayer and Argyres (2004) find that in industry contexts marked by high rates of information change, contracts function as a knowledge repository that guides information transfer between firms:

> *"…Contracting processes, our evidence suggests, might in some instances serve to help develop and codify such knowledge sharing routines. Moreover, it is well-established that transferring knowledge within or between organizations often requires at least some codification (e.g., Nonaka and Takeuchi 1995). By providing a means for this to occur, contracting processes could facilitate the development of such relational capital, in the form of a collaboration capability..." (Mayer and Argyres 2004)*

Further, governance structures with greater levels of hierarchical control, say equity arrangements, reduce information overload in the BPO relationship through reduction in diversity of output and division of labor. The greater the levels of hierarchical control, the more the resources of the outsourcing structure are dedicated to the mandate of optimizing activities that contribute to the accomplishment of jointly defined outsourcing objectives. This eliminates the need to process information to determine or schedule priorities. This strategy of creating self-contained, autonomous governance structures with high levels of hierarchical control is analogous to the IP strategy of creating self-contained tasks (Galbraith 1973) in organizations. Self-containment limits costly IP involving negotiation of resources, skills and other inputs and shifts managerial attention to outputs in the relationship. This is because an outsourcing structure with greater hierarchical control and autonomy has likely a dedicated management team, control apparatus and other strategic resources allocated at the outset.

Finally, the level of informality in hierarchical governance structures is relatively high (March and Simon 1967), enabling timely sharing of information, expertise and clarification of task outputs that must ultimately be integrated back into the user firm's value chain. The higher levels of informality, in addition to facilitating a shared understanding of changes in the information environment of the outsourced process, help to create a sense of shared purpose that minimizes conflict between participant firms and allied IP needs.

Thus, different levels of hierarchical control provide differing levels of IP capabilities along a continuum ranging from mechanistic to organic. The above discussion emphasizes that BPO relationships with more hierarchical controls provide greater IP capabilities than those with fewer controls. User firms will seek the governance structure that is discriminatingly aligned with the IP requirements of the relationship and provides requisite amount of information. We posit:

Hypothesis 1: The greater the IP requirements of the BPO relationship, the more hierarchical is the governance structure used to organize it.

Technological Capabilities of the BPO Relationship

Research in the information systems tradition emphasizes the role of information technologies in helping firms address their IP requirements, and finds that technological investments and decision structures are often jointly determined in organizations (Brynjolffson and Mendelson 1993; Mendelson and Pillai 1998). In this section, we study contingent complementary and substitutional relationships between technological capabilities of the BPO relationship and hierarchical control to theorize how choice of the former could potentially moderate the latter.

A firm's technological resources enhance the capacity of existing channels of communication, create new channels of communication, and introduce new decision mechanisms (Galbraith 1973). A hierarchical governance structure involves complex planning and coordination mechanisms, greater number of embedded rules and routines and thus, greater organizational memory. Sophisticated technological capabilities are central to such complex coordination inherent in high levels of hierarchical control. They enable accurate and timely incorporation of changes in the management and execution of the process, increase the amount of information transmitted and received per unit of time between decision makers, are central to the timeliness and accurate interpretation of information, and the reduction of information overload. Given the important role of technological capabilities in the effective representation of information flows required for overall sound decision making, we posit:

Hypothesis 2a: The greater the technological capabilities of the BPO relationship, the greater are the positive impact of IP requirements on the level of hierarchical control in the governance structure, i.e. the use of technological capabilities complements hierarchical control in managing the IP requirements of the BPO relationship.

An alternative theoretical argument is that the technological capabilities of the BPO relationship, in establishing a highly standardized "technical grammar" or social conventions around which firms coordinate their activities, limit the need for hierarchical control in the relationship to promote coordination (Argyres 1999). This is because the "technical dialog" facilitated by such grammar reduces the amount of information exchange between firms required to execute the outsourced process successfully, and allows accurate expectations about a partner firm's response to mutual interdependencies. Since the legitimization and reinforcement of information flows to coordinate process tasks between the user firm and service provider is an explicit objective of hierarchical control, the use of technological capabilities to achieve this objective reduces the use of hierarchy.

Further, research in information systems and organizational economics (Gurbaxani and Whang 1991, Clemons et al. 1993, Picot et al. 1996) emphasizes that technological investments potentially reduce transaction costs arising from incentive misalignments and potential opportunism. This is because the technical grammar established by technological investments reduces the need for specific investments that are vulnerable to appropriation by opportunistic firms. Sophisticated technologies also afford accurate performance measurement and monitoring of activities, thus reducing costly agency measurement costs. This ability of technology to address uncertainty perceived by the user firm about its relationship with the service provider also contributes to the reduction in IP and the allied need for hierarchical control.

Hypothesis 2b: The greater the technological capabilities of the BPO relationship, the lower are the positive impact of IP requirements on the level of hierarchical control in the governance structure, i.e. the use of technological capabilities substitutes hierarchical control in managing the IP requirements of the BPO relationship.

Antecedents of IP Requirements of the BPO Relationship

Uncertainty in the Business Environment

Uncertainty in the user firm's business environment refers to the degree of discontinuous change within the environment. Environmental uncertainty impacts IP requirements in many ways. Uncertainty gives rise to probabilistic linkages between potential path (organizational) activities and desired outcomes (Schroder et al. 1967; Campbell 1988). Given the presence of unbounded path possibilities, these probabilistic linkages increase the range of action-outcome contingencies as well as the pool of potential paths leading to desired outcomes. Systematic allocation of information resources are required to monitor, interpret and forecast diverse action-outcome contingencies, and negotiate paths that are best aligned with the objectives of the BPO relationship. Such contingencies include but are not limited to technological breakthroughs, shifts in consumer profile and taste, new modes of operational efficiency, and modifications to cost structures. Precise conceptualizations of such information seeking behavior include environmental scanning (Agarwal 1967), information search (Vandenbosch and Higgins 1996), and knowledge sourcing (Gray and Meister 2004).

Further, the information dimension of organizational products or services is time-sensitive (Glazer 1991). Therefore, as the rate of information change in the environment increases, there is increased pressure on the firm to use extant information quickly and to a wider effect. Assuming changes to organizational products and services are costless, environmental uncertainty gives rise to a rapid evolution of the core product/ service and a shift toward successive

generations of the outsourced process, thereby increasing information churn in the outsourced task environment (Glazer 1991). Thus, we posit:

Hypothesis 3: The higher the levels of uncertainty in the user firm's business environment, the higher are the IP requirements of the BPO relationship.

Uncertainty in the BPO Relationship

The uncertainty perceived by the user firm about its relationship with the BPO service provider is an important antecedent to the user firm's IP requirements. The analysis of market transactions focuses on the consequences of environmental uncertainty, while the study of hierarchical organization of economic activity focuses on task uncertainty. However, since BPO represents a shift from the dichotomy of markets and hierarchies to strategic, collaborative partnership forms, we separate the effects of relational uncertainty on IP requirements from the effects of environmental and task or process uncertainty. Relational uncertainty engenders exchange hazards and increases the frictional costs of transacting. We conceptualize uncertainty in the BPO relationship through (i) relative bargaining power of the provider (ii) mutual trust and (iii) relational interdependence. These factors define the "climate" (Bensaou 1997) of the BPO relationship and thus, the uncertainty perceived by the user firm.

Bargaining Power: Bargaining power refers to "a bargainer's ability to favorably change the 'bargaining set', to win accommodations from the other party, and to influence the outcome of a negotiation" (Yan and Gray 1994). In this study, we focus on the alternatives available to the user firm in the context of outsourcing negotiations that is positively related to the service provider's bargaining power (Fisher & Ury 1981; Gopal et al. 2003). More alternatives afford the user firm the opportunity to exercise its best alternative to a negotiated agreement, and prevent the service provider from locking in the user firm. This, in turn, reduces the provider's bargaining power.

The relative bargaining power of the service provider is an important antecedent to the user firm's IP requirements. The user firm processes information to anticipate needs and costly contingencies in the exchange process, and specify them ex ante. It also expends information resources to monitor and manage probable opportunistic behavior against complex safeguards. The greater the relative bargaining power of the service provider, the greater is the information turnover in the relationship to address the uncertainty that stems from such bargaining power. Thus, we posit:

Hypothesis 4a: The higher the levels of bargaining power of the service provider relative to the user firm, the higher are the IP requirements of the BPO relationship.

Mutual Trust: Prior research (Zaheer et al. 1998; Gulati and Singh 1998) in organization and strategy identifies trust as an important relational dimension that addresses both appropriation and coordination concerns in economic transactions. Mutual trust, in reducing information asymmetries between participant firms, mitigates problems of adverse selection, increases the predictability of firm behavior, and engenders greater "domain consensus" (Levine and White 1961). Consequently, user firms expend relatively lesser information to resolve conflicts, assess and monitor the service provider's behavior, and enforce contractual provisions.

In addition, given that mutual trust often stems from prior cooperative association between the user firm and the service provider (Kale et al. 2000), we note that it is associated with greater knowledge of partner firm behavior, processes and routines. Thus, coordination efforts and allied IP required to manage the interface between participant firms, including developing shared understandings and integrating actions, are relatively lower. Given the above arguments, we posit:

Hypothesis 4b: The higher the levels of mutual trust between the user firm and the service provider, the lower are the IP requirements of the BPO relationship.

Relational Interdependence: Interdependence exists "when actions taken by one referent system affect the actions or outcomes of another referent system" (McCann and Ferry 1979). In the BPO relationship, interdependence between the user firm and the service provider introduces the need to gather, analyze and distribute pertinent process information among organizational actors in both firms. Such information is required to allocate task responsibilities, aid ongoing mutual adjustments in behavior, integrate effort to maximize process value, and facilitate timely communication and decisions. Further, interdependencies in collaborative outsourcing relationships require investments in knowledge sharing, development of trust, social ties and shared norms. Such investments to promote

synergistic behavior directed towards collaboratively satisfying business objectives also results in an increase in the IP requirements of the BPO relationship. Thus, we theorize:

Hypothesis 4c: The higher the levels of interdependence between the user firm and the service provider, the higher are the IP requirements of the BPO relationship.

Uncertainty in the Outsourced Business Process

When uncertainty in the outsourced business process is high, the establishment of routines and procedures for process execution and management becomes difficult, and participant firms are frequently confronted with unfamiliar events during process execution that are not covered by internal or standard representations. The consequent need for acquisition of process information from diverse organizational actors on an ongoing basis to cope with a wide range of problems and decisions increases the amount of information processed (Daft and Macintosh 1981).

In addition, BPO pervades an organization horizontally, and may require the sponsorship of several internal departments. Process uncertainty engenders repetitive cycles of intra-organizational information exchange towards integrative bargaining and reconciliation between stakeholders of BPO, deciding what tasks in the outsourced process to disaggregate from the value chain, and coordinating varied efforts required to transfer value from the outsourced task environment back to the user firm. Such enhanced information flows between sponsoring departments also contribute to increase in the user firm's IP requirements. We propose two primary sources of uncertainty in the outsourced business process: (i) process complexity and (ii) process interdependencies.

Process Complexity: Process complexity is defined in terms of process analyzability and process variety. An analyzable process comprises events that are "hard, measurable and determinant" (Daft and Weick 1984). When a process is analyzable, outcomes are well-understood, and the process administrators follow an objective, computational procedure to resolve problems (Daft and Macintosh 1981). We define process variety as the frequency of occurrence of process events that deviate from mean values of stability and uniformity of inputs and outputs, thereby requiring different methodologies than is the norm for successful completion of process objectives. Our conceptualization of process variety is consistent with the early notion of task variability or content variety (Perrow 1967; Van de Ven and Delbecq 1974) as well as the more recent concept of sequential variety (Pentland 2003). Pentland (2003) points out that while content variety focuses on variability in the inputs or outputs, sequential or process variety reflects diversity of work processes that an organization uses to transform inputs into outputs. Complex business processes are marked by low levels of analyzability and high variety.

An increase in process complexity renders it relatively difficult to establish rules, procedures and predetermined responses to potential process problems. In this case, given the relatively few information cues, process complexity causes increased number of process exceptions or deviations. Incomplete process information also implies that it is difficult to identify the type of information needed and assess the utility of that information to an outsourced task. All of these result in greater information turnover in the BPO relationship. Thus, we posit:

Hypothesis 5a: The higher the levels of complexity of the outsourced business process, the higher are the IP requirements of the BPO relationship.

Process Modularity: The modularity of the outsourced process is defined by its ability to function as a coherent sub-task that can be analyzed, modified, and enhanced, independent of its influence on other organizational processes. Interdependencies of the outsourced business process require repetitive cycles of identification of process stakeholders, impact assessment, and bargaining and reconciliation among these stakeholders. They also limit the synergistic specificity or degree to which the outsourced process achieves greater functionality by its components being specific to one another, thereby, necessitating variety in coordination efforts required to transfer value back to the user firm. The increased level of intra-organizational coordination required to support process interdependencies increases the IP requirements of the BPO relationship. Thus, we hypothesize:

Hypothesis 5b: The higher the levels of modularity of the outsourced business process, the lower are the IP requirements of the BPO relationship.

Figure 1 below details the above theoretical relationships developed in this study.

Figure 1: Research Model and Hypotheses
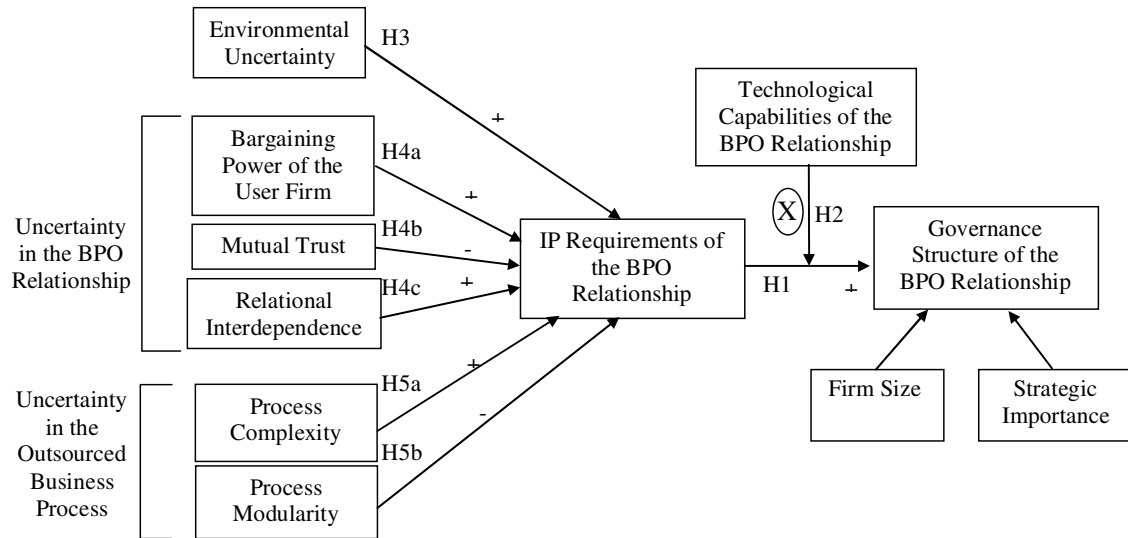
Empirical Analysis

Data Collection

The data for this study were obtained through a survey of senior executives responsible for the management of outsourced business processes in their respective firms. Our list of respondents came from several active compilations of outsourcing firms, industry association referrals, and outsourcing advisory referrals. A technique deployed in related research in surveying executives is "to define populations and response rates based on those who will pre-commit to respond" (Poppo and Zenger 2002). The normative response rates based on pre-committed samples are as high as 40 percent (Anderson and Narus 1990; Poppo and Zenger 2002). Six hundred pre-committed surveys were mailed, with follow-up letters five weeks later. We received a total of 145 valid responses of which 130 were complete in all respects. This response rate of approximately 24% was lower than expected, and was likely due to the lengthy and extensive nature of the questionnaire. However, it is consistent with the rate found in other studies (Mohr and Spekman 1994; Weiss and Anderson 1992). The final sample was representative of a range of outsourcing objectives for which there was sufficient variance in relational and process attributes.

No evidence of response bias was found in the data. We also checked for the presence of common-method bias through Harman's single-factor test (Podsakoff & Organ, 1986). All of the variables in our study were simultaneously subject to an exploratory factor analysis, and the results of the unrotated factor solution were examined. The absence of a single factor that explained a significant amount of variance in the data suggested that common method bias did not likely impact survey responses.

Finally, a section of the raw data was also randomly subject to independent cross validation exercises. For a random sample of 25 firms, we requested the respondent firm to identify the vendor for the outsourced process for the purpose of a brief interview. 10 firms obliged, and we interviewed the vendors for the outsourced process to obtain relevant process information. The two information sets in the user firm-provider dyad were mutually consistent.

Measures

In the case of variables that have been used in prior research, we adopted their measures after testing for reliability and content validity. In the case of variables that were unique to our theoretical model, we developed measures

based on operationalization of similar variables and discussions with different classes of BPO stakeholders. The measurement items were tested for content validity through discussions with outsourcing practitioners. Reliability of all multiple-item scales used in the study were satisfactory with Cronbach alpha values greater than 0.70.

Among the variables studied, new measures were created for IP requirements of the BPO relationship. We base the construct's measurement on Keller's (1994) measurement of IP by project groups. Two items measure the amounts of information communicated within the user firm and with the service provider. Two other items ask about the use of external agencies such as law firms, consulting firms, etc. and the different stages of the outsourcing process in which these agencies were used (for example, contract negotiation, vendor evaluation, etc.).

Data Analysis

We used regression analyses of the dataset to test our hypotheses. Ordinary least squares (OLS) estimates were used to test the hypothesized effects of various dimensions of uncertainty – environmental, process and relational - on IP requirements of the BPO relationship. The results of this estimation are presented as Model I in Table 3. In testing our model of governance choice, the use of OLS estimates is inefficient since the dependent variable, governance type, is ordinal. Thus, we used an ordered logistic specification to test these hypotheses:

$$Gov = f(X'\beta) + \bar{u} .$$

The specification was estimated using maximum likelihood, and the results are shown in Table 1.

The explanatory variables in our baseline transaction cost model of governance choice, presented as Modell II in Table 3, comprise sources of relational uncertainty alone. Models III – V test the mediating effect of IP requirements on governance choice in BPO relationships. Model III includes all three dimensions of uncertainty as explanatory variables, Model IV tests the impact of IP requirements on governance choice, and Model V tests the influences of IP requirements while controlling for the influence of all three dimensions of uncertainty. We also conducted principal versions of the Sobel test (MacKinnon et al. 1995; Sobel 1982) in order to assess whether the indirect effect of different sources of environmental, process and relational uncertainty on governance choice via IP requirements is significantly different from zero.

Models VI – VII test whether the technological capabilities of the BPO relationship moderate the effect of IP requirements on governance choice by regressing the interaction between technological capabilities and IP requirements on governance choice. We note that firms self-select the observed technological capabilities based on their own analyses of the outsourcing context that also motivates choice of hierarchical control. The failure to correct for unobserved firm- and transaction-level factors that simultaneously influence choice of technological capabilities and hierarchical control results in biased and inconsistent estimates. Thus, to account for possibly endogenous choices of technological capabilities, we employ a switching regression model (Heckman 1979; Lee et al. 1980; Smith 1980) to estimate moderation effects.

We conceptualized two levels of technological capabilities – high and low. We define the technological capabilities to be equal to one for cases where capabilities are high, and equal to zero for cases where capabilities are low. We define the threshold value for high technological capabilities as the response value of 5. We tested for and found no loss of information in the recoding process. We first estimate the following first stage probit model that represents the selection equation.

$$\Pr(Y_i = 1) = \Pr(Tech\_Capabiliti\,es_i > 4) = \Phi(\beta'X_i)$$

Using the predicted probabilities from the above probit model, we construct the inverse Mills ratio, λ_{ji}, which is included as a control variable in the second-stage model of choice of hierarchical control. A point of note at this stage is that since this specification requires that the dependent variable be continuous, we transformed the ordinal hierarchical control variable into a standardized z-score. This is consistent with prior research (Freeman 1978; Pouliakas and Theodossiou 2007) which, in following a similar process, finds that such transformation does not distort regression results. Thus, the switching regression allows us to systematically discern the influence of IP requirements across both levels of technological capabilities. The second-stage models, which incorporate the correction for self-selection, provide consistent and unbiased estimates. Our analysis uses robust (Hubert-White) standard errors to calculate t-statistics for all regressions.

RESULTS

Antecedents of IP Requirements of BPO Relationships

Table 1 below presents the results of analyses of IP requirements and governance choice in our sample of BPO relationships.

Table 1: Antecedents of IP Requirements and Governance Choice in BPO Relationships

Variable	Model I IP Requirements	Model II Governance Structure	Model III Governance Structure	Model IV Governance Structure	Model V Governance Structure	Model VI Governance Structure	Model VII Governance Structure
Uncertainty in the BPO Relationship							
Bargaining Power	0.283*** (0.083)	0.413*** (0.111)	0.380*** (0.116)		0.270** (0.121)	0.293** (0.116)	0.302** (0.118)
Mutual Trust	-0.224*** (0.081)	-0.297** (0.145)	-0.319** (0.156)		-0.216 (0.156)	-0.203 (0.156)	-0.232 (0.167)
Relational Interdependence	0.156* (0.090)	0.395*** (0.127)	0.304** (0.141)		0.254* (0.134)	0.251* (0.136)	0.222 (0.136)
Uncertainty in the Outsourced Business Process							
Process Complexity	0.202** (0.095)		0.325** (0.152)		0.273* (0.147)	0.288* (0.149)	0.245 (0.152)
Process Modularity	-0.168** (0.083)		0.005 (0.141)		0.100 (0.136)	0.103 (0.138)	0.119 (0.142)
Environmental Uncertainty	0.212*** (0.081)		0.092 (0.110)		-0.004 (0.114)	0.020 (0.116)	0.021 (0.118)
Information Requirements (IR)				0.658*** (0.113)	0.496*** (0.130)	0.540*** (0.130)	0.507*** (0.134)
Technological Capabilities						-0.146 (0.124)	-0.189 (0.127)
IR x Technological Capabilities							0.241* (0.144)
Firm Size		0.311*** (0.105)	0.266** (0.107)	0.219** (0.102)	0.199* (0.104)	0.185* (0.108)	0.185* (0.109)
Strategic Importance		0.191* (0.102)	0.161 (0.107)	0.193** (0.094)	0.200* (0.110)	0.223* (0.115)	0.233* (0.120)
Model R^2 / Likelihood Ratio Index	0.35	0.13	0.17	0.16	0.21	0.22	0.23

*** denotes significance at 1%, ** at 5%, and * at 10% respectively.

Model I tests the impact of various dimensions of uncertainty on the information requirements of the BPO relationship.

Model II tests the theoretical premise of TCE, Models III – V test the mediating effect of information requirements on governance structure, and models VI – VII test the moderating effect of technological capabilities on governance structure.

In the ordered probit models, positive coefficients indicate higher degree of hierarchical control in the governing contract as the value of the associated variable increases, while negative coefficients suggest the converse.

Prior research suggests that the pseudo-R-square in the ordered probit model tends to underestimate the proportion of variance explained.

Numbers below coefficients in parentheses are standard errors that are adjusted for correlations at the individual level and are robust to arbitrary heteroscedasticity.

Model I in Table 1 presents the results of our analyses of determinants of IP requirements of the BPO relationship. Potential multicollinearity problems were investigated by examining tolerance (TOL), variance inflation factors (VIFs) and condition indices for the predictor variables. An analysis of these measures suggested that none of the coefficients were biased by multicollinearity. The coefficients of predictors in Model I indicate that in information

intensive outsourcing relationships, information is processed to address uncertainty in the business environment (*Hypothesis 3*), relationship with the provider (*Hypotheses 4a-4c*) and outsourced task (*Hypotheses 5a-5b*). IP theories, which are often applied to the study of intra-organizational adaptation, focus on uncertainty in organizational tasks. Our results suggest that in extending IP theories to the study of inter-organizational adaptation, these additional dimensions of uncertainty must be recognized.

Mediating Effect of IP Requirements on Governance Choice

Model II in Table 1 provides a baseline transaction cost specification that includes only sources of relational uncertainty. All three sources are significant predictors of governance choice. The results are aligned with the transaction cost perspective that vertical relationships characterized by higher levels of relational uncertainty will likely be organized under more hierarchical contracts.

Model III introduces environmental and process uncertainty as additional antecedents of governance choice. Although process modularity and environmental uncertainty are not significant influencers of hierarchical control, process complexity emerges as a significant predictor of governance choice. The result is consistent with emergent research (for e.g. Gulati et al. 2005) which suggest that both appropriation concerns resulting from relational uncertainty and coordination concerns arising from process uncertainty are important considerations for the design of hierarchical control in vertical relationships. The significant improvement in the F-test for the model and the likelihood ratio index confirms the value of incorporating process complexity into our analysis.

Model IV introduces IP requirements of the BPO relationship as a predictor of governance choice. The results confirm that hierarchical control in information intensive outsourcing relationships such as BPO is clearly a response to the IP requirements of the relationship. Model V finds that after controlling for the influence of all previously regressed variables, IP requirements is still a significant predictor of choice of hierarchical control, thereby, providing support for *Hypothesis 1*. A comparison of Models III and V indicates that the significance of sources of relational uncertainty and process complexity reduces on addition of IP requirements. The results of Models III-V in conjunction with that of Model I suggest that IP requirements of the relationship partially mediate the effect of relational uncertainty and process complexity on choice of hierarchical control.

However, the above four step approach to analyzing mediation neither tests the significance of the indirect effect nor considers probable suppressed relationships. An alternative is to conduct the Sobel test (MacKinnon et al. 1995; Sobel 1982) to calculate the significance of the indirect effect of uncertainty. We calculate this indirect effect by multiplying the simple coefficient for a given dimension of uncertainty predicting IP requirements in Model I with that of the partial regression effect for IP requirements predicting governance choice in Model IV.

<u>Model I</u>: $IP\_Re\,q = \alpha_0 + \alpha_1 Env\_Uncer + \alpha_2 Re\,l\_Uncer + \alpha_3 \Pr ocess\_Uncer + \varepsilon$

<u>Model IV</u>: $Gov = \beta_0 + \beta_1 Env\_Uncer + \beta_2 Re\,l\_Uncer + \beta_3 \Pr ocess\_Uncer + \beta_4 IP\_Re\,q + \varepsilon$

We find that the mediation model was supported for all sources of uncertainty ($p<0.05$) confirming the mediating effect of IP requirements of the BPO relationship on governance choice.

The results for the controls used in our analyses are largely consistent with prior research. Strategic importance of the outsourced process is a significant predictor of hierarchical control in almost all specifications. Strategic BPO relationships are characterized by high payoffs and thus, are frequently long-term, close and involve a sustained, focused and complex pattern of interaction between and within each of the participant firms (Ford 1990). These integrative patterns of cooperation and coordination embodied in a strategic BPO relationship necessitate greater hierarchical control. The significantly positive coefficient of firm size is consistent with research findings that larger firms often have "superior financial and human resource endowments" (Leiblein et al. 2002) required to invest in mechanisms of hierarchical control.

Moderating Effect of Technological Capabilities of the BPO Relationship

Model VI in Table 1 introduces technological capabilities of the BPO relationship as a predictor of governance choice, and Model VII introduces the interaction between IP requirements and technological capabilities as a predictor of governance choice while controlling for the individual effects of these variables. The significance of the interaction term provides initial evidence of the moderating effect of technological capabilities. However, given the

empirical need to control for self-selection of technological capabilities or firm- and transaction-level heterogeneity that impacts choice of technological capabilities and hierarchical control, we use a switching regression model to estimate the moderation effect. Table 2 presents the results of the first stage probit model of choice of technological capabilities. Given that the results in Table 2 are primarily used to formulate the inverse mills ratio, we do not discuss these results at length. We note that the instrumental variable used is a significant predictor of technological capabilities. Consistent with the IP view of the firm, we find that such capabilities are an important response to the IP requirements of the BPO relationship. Strategic importance of the outsourced process is significant, and is consistent with the notion that technology plays a pivotal role in managing the sets of information exchanged between a firm and its customers and maximizing information as the key strategic asset (Glazer 1999).

Table 2: First Stage Probit Estimates of Technological Capabilities of the BPO Relationship[1, 2, 3]

Variable	Technological Capabilities
IP Requirements	0.389** (0.181)
Environmental Uncertainty	0.155 (0.174)
Uncertainty in the BPO Relationship	
Relative Bargaining Power	0.209 (0.146)
Mutual Trust	0.127 (0.184)
Relational Interdependence	-0.100 (0.177)
Uncertainty in the Outsourced Business Process	
Process Complexity	0.047 (0.185)
Process Modularity	0.082 (0.170)
Firm Size	-0.120 (0.136)
Strategic Importance	0.235* (0.126)
Technological Resources of the Firm	0.407** (0.178)
Model R^2 / Likelihood Ratio Index	0.22

1. Positive coefficients indicate a greater probability of choice of high technological capabilities
2. *p<0.10, **p<0.05, *** p<0.01 in a two tailed test
3. Numbers below coefficients in parentheses are standard errors that are adjusted for correlations at the individual level and are robust to arbitrary heteroscedasticity.

Initial specifications of the second stage model of choice of hierarchical control across the sub-samples of technological capabilities focused on self-selection bias due to unobservable variables correlated with choice of both technological capabilities and hierarchical control. However, our analyses found no evidence of sample selection bias - the inverse mills ratio was insignificant in the governance choice regressions in both samples. We also found no evidence of multicollinearity between the inverse Mills ratio and the other explanatory variables in both samples that might inflate the standard errors of such estimates and consequently, understate the statistical significance of selection bias in the regression of hierarchical control.

Table 3 provides results of the regressions of hierarchical control. We find that while controlling for technological capabilities, IP requirements are a positive and significant predictor when technological capabilities are high but insignificant when capabilities are low. This confirms the moderating effect of technological capabilities on the relationship between IP requirements and governance choice posited in *Hypothesis 2a*. Evidence of the complementary relation between technological capabilities and IP requirements rejects the substitutional effect of these variables on hierarchical control theorized in *Hypothesis 2b*.

Table 3: Switching Regression – Estimates of hierarchical controls across different levels of technological capabilities[1,2]

Variable	Hierarchical Control (High Tech Capabilities)	Hierarchical Control (Low Tech Capabilities)
IP Requirements	0.543*** (0.158)	0.275* (0.144)
Environmental Uncertainty	0.099 (0.150)	0.155 (0.118)
Uncertainty in the BPO Relationship		
Relative Bargaining Power	0.263** (0.128)	0.377*** (0.117)
Mutual Trust	-0.092 (0.127)	-0.230 (0.149)
Relational Interdependence	0.281* (0.148)	0.100 (0.115)
Uncertainty in the Outsourced Business Process		
Process Complexity	0.089 (0.202)	0.228* (0.125)
Process Modularity	0.037 (0.151)	0.178 (0.115)
Firm Size	-0.125 (0.127)	0.153 (0.098)
Strategic Importance	-0.073 (0.114)	0.388** (0.150)
Correction for self-selection (λ)	-0.002 (0.207)	0.331 (0.204)
Adjusted R-Square	0.40	0.29
N	80	51

1. $*p<0.10$, $**p<0.05$, $***$ $p<0.01$ in a two tailed test,
2. Numbers below coefficients in parentheses are standard errors that are adjusted for correlations at the individual level and are robust to arbitrary heteroscedasticity.

CONCLUDING DISCUSSION

Over the past few years, outsourcing of value chain functions has gained significant momentum as organizations increasingly outsource broader business processes – particularly information intensive ones such as human resources, finance and accounting, supply chain management and customer care – to achieve diverse strategic objectives. The findings in this study shed light on how user firms in these BPO initiatives choose from among diverse governance structures to formalize their relationship with the service provider. The typology of governance structures used in this study is primarily defined by the level of hierarchical control embodied in the structure. In a shift from the traditional transaction cost framework of governance choice, we find that IP requirements of the BPO relationship is an important predictor of the level of hierarchical control employed with technological capabilities of the relationship moderating such impact of IP requirements. Further, we extend Galbraith's original IP framework to the BPO context to find that uncertainty in the user firm's business environment, outsourced business process and BPO relationship are important antecedents of IP requirements of the BPO relationship, emphasizing that IP requirements mediate the effects of these dimensions of uncertainty on governance choice.

The results provide strong support for the influence of IP requirements on governance choice in the relationship. This result suggests that the governance structure is not just a contractual mechanism that addresses incentive conflict and considerations of hold-up, as posited in prior research, but also an important informational response to diverse contingencies that reduces the information states that decision makers have to contend with in the relationship. Our results emphasize that the central role of IP requirements in BPO relationships must be investigated more closely in future research. Given that an understanding of IP requirements is important for

efficient governance choices in BPO relationships, it may also well influence the fundamental choice of firm boundaries and could be examined in future research as an important basis for why firms exist.

We theorize and find support for the simultaneous influence of sources of three important dimensions of uncertainty on IP requirements – the characteristics of the market environment within which the BPO relationship operates, the characteristics of the BPO relationship, and the characteristics of the outsourced process or function. These dimensions of uncertainty and their influences have been discussed in separate research streams. For example, TCE (Williamson 1991) focuses on the discriminating alignment between relational uncertainty and governance choice while IP theories (Galbraith 1973) emphasize that organizational structure must be responsive to uncertainty and contingencies in organizational tasks. An important contribution of this study is the development of a theoretical framework that captures the comparative and cumulative influence of these factors on the organization of vertical relationships. The synergistic impact of these dimensions of uncertainty on IP requirements emphasizes that their joint assessment is necessary in future research to enhance the explanatory power of extant theories of organization.

Our finding that technological capabilities of the BPO relationship moderate the impact of IP requirements on the level of hierarchical control in the relationship suggests that sophisticated technologies in information intensive outsourcing relationships are increasingly used to enhance interactions and coordination between the user firm and service provider rather than provide transaction processing capabilities. This is consistent with prior research (Mendelson and Pillai 1998; Zuboff 1998) which indicates that in fast-clockspeed environments, the emphasis of technology shifts from *automating* to *informating* or ensuring that the right information is available to the right decision maker at the right time. Our results for the predictors of hierarchical control across both high and low levels of technological capabilities after controlling for the influence of IP requirements also support this viewpoint. Given expansive and intensive use of sophisticated technologies in the outsourced task environment, hierarchical control is primarily a response to the need to coordinate process information across firm boundaries and manage the ensuing interdependencies between firms in this regard. On the other hand, given lower levels of technological capabilities, the results suggest that hierarchical control is primarily used for better control and monitoring of flows and processes between the firms to address appropriation concerns that stem from lack of mutual trust and strategic importance of the outsourced process. The relatively lower significance of bargaining power when technological capabilities are high is also consistent with the greater emphasis on coordination in this case.

This study is subject to limitations. One assumption of the IP theory is that interaction effects of IP requirements and capabilities dominate the main effects of these variables (Drazin and Van de Ven 1985). Thus, capabilities choice is not a constant, but needs to change. Likewise, IP requirements of the user firm and its antecedents may also change during learning processes in a continuous feedback system where requirements and capabilities adapt to each other (Sobrero and Schrader 1998). Thus, it is important to recognize that as the goals and expectations of the user firm and service provider evolve over time, the IP requirements of the BPO relationship and its antecedents also evolve. In the current study, we have only cross-sectional data, which limits our ability to provide a richer conceptualization of the theoretical relationships. A multi-period model will address this issue and introduce a dynamic perspective that has been neglected by structural contingency frameworks.

The next limitation also presents an important avenue for further research. Although this study presents the view that effective information processing is a strategic goal of governance choices in information intensive outsourcing relationships, we do not examine the impact of such informational-focus governance choices on exchange performance. Future research could relate the alignment between the IP requirements and governance choice to exchange performance and ultimately to financial value and firm competitiveness.

Despite these limitations, we believe that this study makes important contributions to the literature on organization of outsourcing relationships. Comprehensive data on transaction and relational characteristics of a range of BPO relationships allows us to take the first step towards explaining the variety of relational structures that user firms and service providers build together to organize the outsourced activity. In doing so, we complement and extend the rich literature on firm boundaries. Our results emphasize that moving forward, as business processes become increasingly information intensive and their externalization matures to being a collaborative process that is increasingly strategic in its impact, the organization of these processes is largely motivated by concerns of information processing that stem from traditional considerations of hold-up as well as issues of work design and task coordination. This is consistent with our belief that hierarchical control in the outsourcing governance structure, in addition to attention to controlling opportunism, enables participant firms to define and coordinate process tasks and responsibilities so as to meet outsourcing objectives and create strategic value.

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