Antecedents and Performance Outcomes of Onshore and Offshore Business Process Outsourcing

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Abstract

Firms are increasingly utilizing onshore and offshore business process outsourcing (BPO) to manage their operations and achieve their strategic objectives. However, there is a lack of understanding of when firms are likely to use BPO, and when firms are likely to see business value from BPO. Building on previous research in transaction cost economics, business process management, strategy and international business, this paper proposes a theoretical framework for adoption and benefits of onshore and offshore BPO, and tests the framework using data on U.S. firms. Our analysis indicates that firms with broader IT application deployment and stronger business process codification are more likely to engage in onshore and offshore BPO. We also find that firms with broader IT application deployment are more likely to experience both cost and quality benefits from BPO.

This study makes two primary contributions to the emerging literature on BPO. First, we draw on previous research in transaction cost economics, business process management, strategy and international business to develop and validate a theoretical model for antecedents and performance outcomes of BPO. We extend previous research to understand the relationship between organization characteristics and adoption and benefits of the emerging practice of onshore and offshore BPO. Second, we establish a link between IT application deployment and BPO adoption and performance outcomes. This research highlights and validates the role that IT plays in enabling firms to locate their business processes across vendor and geographic platforms, and in facilitating cost and quality benefits from BPO.

Keywords: Business process outsourcing, BPO, onshore, offshore, IT application deployment, process codification, performance outcomes, cost, quality.
1. **INTRODUCTION**

Firms are increasingly utilizing business process outsourcing (BPO) to manage their operations and achieve their strategic objectives (Adler 2003; Venkatraman 2004). In BPO, a firm delegates one or more IT intensive business processes, such as HR or accounting, to be managed and delivered by an external vendor. Pfannenstein and Tsai (2004) suggest that BPO emerged as IT outsourcing vendors gained understanding during the 1990’s, and then began specializing in functional areas where they would handle business processes along with the underlying IT. Because BPO involves critical processes that are interconnected with other core processes in the firm, it is more difficult to specify the transaction characteristics and contingencies in BPO compared with those in outsourcing other goods and services. Another differentiating factor for BPO is the rapid speed with which offshore vendors have emerged as a viable mechanism to deliver BPO services. While the use of BPO increased only during the past decade, it is estimated that by 2007 14% of BPO services will be delivered using offshore resources (Stone and Brown 2004).

Despite the growing significance of business process outsourcing, there is limited understanding of the factors that enable firms to engage in BPO and the benefits that firms receive from BPO. While most existing information systems literature on outsourcing focuses on the IT function (Ang and Straub 1998; Lacity and Willcocks 1998; Loh and Venkatraman 1992; Teng, Cheon and Grover 1995), a recent and comprehensive review (Dibbern, Goles, Hirschheim and Jayatilaka 2004) notes that IT outsourcing research provides a foundation for research on BPO and offshoring. Early information systems work on BPO conceptualized the factors that make some services more amenable for offshore BPO (Apte and Mason 1995), and more recent work examines supplier capabilities, best practices and benefits from BPO using case-based and analytical research (Dutta and Roy 2005; Feeny, Lacity and Willcocks 2005; Lacity, Feeny and Willcocks 2003). Currently, there is very little rigorous empirical work that examines the antecedents and business value of the emerging practice of onshore and offshore BPO.

In this paper we build on previous research in transaction cost economics, business process management, strategy and international business to develop a theoretical model for the antecedents and
business value of BPO. We validate this model by conducting an empirical study across a broad cross-section of U.S. publicly traded firms using archival data from InformationWeek, a leading and widely circulated IT publication. We complement the InformationWeek outsourcing and IT data with financial and industry data from Compustat, Dun & Bradstreet, Securities and Exchange Commission (SEC) filings, and annual reports.

This study is important for both research and managerial practice. From a research perspective, there is a need to identify the conditions under which firms are more likely to outsource their critical business processes. While it is generally assumed that information technology enables the outsourcing of business processes (Venkatraman 2004), it is important to empirically test and validate this assumption. From a practice perspective, it is important for firms to evaluate their strategic and operational readiness for BPO. Insights from our study will also be helpful for BPO vendors to target potential customers based on their observed characteristics such as IT application deployment and business process codification. It is also important for researchers and firms to understand the IT and strategy execution mechanisms that lead to cost and quality benefits from BPO.

The rest of the paper is structured as follows. Section 2 reviews the background literature and develops hypotheses. Sections 3 and 4 discuss the methodology and present results. Section 5 outlines implications of the study.

2. THEORY AND RESEARCH MODEL

The use of BPO is a technology enabled administrative innovation, and researchers have shown that organizational characteristics are a significant factor that dictates which firms adopt such innovations (Kimberly and Evanisko 1981; Tornatsky and Fleischer 1990). We draw on the transaction cost economics, business process management, strategy and international business literatures to develop the theory underlying our hypothesized research model (Figure 1), and to identify relevant firm characteristics that explain BPO use and benefits for firms.

---Insert Figure 1 about here---
2.1 IT Application Deployment and BPO Adoption

Transaction cost economics (TCE) provides one theoretical perspective to evaluate outsourcing considerations. The transaction cost literature argues that firm boundaries are determined by a tradeoff between the production cost advantages of outside procurement in market relationships and the transaction cost advantages of internal production within hierarchies (Williamson 1975). Markets and hierarchies entail different levels of production and transaction costs. Markets may offer lower production costs through economies of scale or specialization, but these advantages come at the expense of higher transaction costs. Transaction costs include finding and contracting with a reliable supplier, monitoring and enforcing the contract, and coordinating with the supplier during the contract term. Transaction costs are presumed to increase with an increase in asset specificity. As asset specificity increases, more complex governance structures are required to ease costly bargaining over profits from specialized assets (Williamson 1985). High transaction costs may overwhelm the savings in production costs from a market transaction, which would in turn lead the firm to vertically integrate the activity and produce internally.

The information systems literature builds on transaction cost theory by suggesting that an increase in the use of IT would lead to increased outsourcing and a shift in firm boundaries for three primary reasons. First, IT reduces coordination costs. IT reduces the time and cost of communicating information, which leads to a tighter coupling of processes that create and use information (Malone, Yates and Benjamin 1987). Malone and colleagues argue that the widespread use of IT decreases the unit costs of coordination, which will lead to the increased use of market transactions between firms. Second, IT mitigates transaction risk by enabling a firm to better monitor vendors (Clemons, Reddi and Row 1993). This would encourage firms to invest in IT for inter-firm coordination, and lead to increased outsourcing of IT intensive activities. Zenger and Hesterly (1997) concur that innovations in IT ease monitoring and communications across firms and facilitate the disaggregation of firms. Third, IT assets are increasingly standardized and not relationship-specific (Clemons, Reddi and Row 1993), alleviating the opportunistic behavior typically associated with asset specificity in transaction cost economics. IT increases a firm’s
ability to coordinate its activities with business partners located nationally and internationally (King 1996; Segal-Horn 1991).

Although previous research has found support for the conjectures relating to the effect of IT on firm boundaries, there is no empirical work that examines the effect of IT on BPO. Brynjolfsson and colleagues (1994) find that IT investment is significantly associated with subsequent decreases in the average size of firms. In a separate study, Hitt (1999) also finds that IT causes a decrease in vertical integration. We extend this stream of work by testing the implications of TCE in the BPO context, and hypothesize that:

**H1:** Firms with broader IT application deployment are more likely to engage in onshore and offshore BPO.

### 2.2 Process Codification and BPO Adoption

A firm’s ability to transfer and coordinate processes across functional and organizational boundaries can impact business outcomes and value creation (Davenport and Short 1990; IBM 1975). Management and organization researchers provide a theoretical foundation for the mechanisms that enable the transfer of processes within and across firms, including the key mechanism of codification.

Codification is closely related to the concept of tacit vs. explicit knowledge. While tacit knowledge is difficult to articulate and can be gained only through experience, explicit knowledge can be communicated between parties (Polanyi 1966; Nelson and Winter 1982). Codification is the compression of knowledge and experience into a structure, which then enables transfer across economic agents (Boisot 1986). The process of codification involves the use of codes and models (Ancori, Bureth and Cohendet 2000), and the translation of rules and actions into procedures, guidelines, specification and documents (Kogut and Zander 1992; Lam 1997).

Information systems researchers have described more specifically the tools involved in codification of business processes. Malone et al. (1999) argue that process representation approaches such as flow charts, data flow diagrams, state transition diagrams, and goal based models have facilitated development of a process grammar to describe complex processes. Basu and Blanning (2003) extend this
work and illustrate the use of metagraphs to represent processes. Use of these codification tools allows knowledge to be captured, specialized and distributed, which contributes to modifying the spatial organization and division of labor and can contribute to the outsourcing of business processes (Cohendet and Steinmueller 2000; Malerba and Orsenigo 2000). Codification makes it possible for buyers and sellers to enter into contractual relationships, in part because codification provides a representation of the specific services that the buyer can expect the seller to provide (Boisot 1986; Cowan, David and Foray 2000).

Codification is relevant in both the domestic and global contexts. Codification makes possible the globalization of local knowledge, and reduces the time to transfer knowledge internationally (Cohendet and Steinmueller 2000; Kogut and Zander 1993). Boisot (1986) concurs in noting: “The move abroad, therefore, is likely to involve organizational functions that trade in well codified information (p. 152).”

To summarize this discussion, process codification can enable the decomposition, reconfiguration and synthesis of business processes, aiding in coordination and management of dependencies across processes and spatially dispersed business units. Codification enables a firm to disaggregate and transfer specific processes to service providers while managing dependencies and seamlessly integrating outcomes of the outsourced process back into the firm’s internal operations. Based on the above discussion, we hypothesize that:

\[ H2: \text{Firms with stronger process codification are more likely to engage in onshore and offshore BPO.} \]

2.3 Strategic Orientation and BPO

Previous research suggests that most firms can be classified as following a primary strategy. In general, at one end of the spectrum, some firms focus on cost leadership by reducing their costs and achieving a lean cost structure. At the other end of the spectrum, other firms pursue revenue expansion based on differentiation in quality or customer service. For example, Rust, Moorman and Dickson (2002) assert that because natural tensions exist between these management approaches, many firms follow
either the cost reduction strategy or the revenue expansion strategy. Their view is consistent with Porter (1980), who also presents a typology in terms of two generic strategies based primarily on cost leadership or differentiation. A cost leadership strategy requires achieving the lowest cost in the value chain, while a differentiation strategy focuses on influencing customer judgments of relative product utility and satisfaction (Day and Nedungadi 1994). While most firms follow either the cost leadership or quality differentiation strategies, it is also possible for firms to follow a hybrid strategy where they pursue cost leadership and quality differentiation at the same time (Miles, Snow, Meyer and Coleman 1978; Porter 1980; Rust, Moorman and Dickson 2002).

A firm’s strategic stance has a significant influence on its operating characteristics and subsequent performance (Chan, Sabherwal and Thatcher 2006). In an IT outsourcing context, Teng, Cheon and Grover (1995) note that the strategic orientation of a firm may affect its propensity to outsource the IS function. Among studies showing links between IT outsourcing and cost reduction, Loh and Venkatraman (1992) found that a higher business cost structure is associated with an increased propensity to outsource the IT function. Similarly, Lacity and Hirschheim (1994) found that senior executives expected IT outsourcing to reduce costs. The information systems literature also acknowledges cost savings resulting from wage differentials as the dominant force in offshoring (Carmel and Tjia 2005; Dibbern, Goles, Hirschheim and Jayatilaka 2004). Based on the above discussion, we hypothesize that:

H3a: Firms with a cost reduction strategy are more likely to engage in onshore and offshore BPO.

More recently, researchers have observed that the motivations for IS outsourcing extend beyond cost. For example, McFarlan and Nolan (1995) note that general managers’ concerns about quality also drive the IT outsourcing decision. Similarly, DiRomulado and Gurbaxani (1998) note that the motivation for IT outsourcing is evolving from a primary focus on cost reduction to other factors, such as improvements in business performance. Firm engage in business process outsourcing and offshoring to leverage the high quality and innovation potential of business partners for sustained value creation and
competitive advantage (Carmel and Agarwal 2002; Engardio et al. 2005; King 2006; Prahalad and Krishnan 2004). The information systems literature also recognizes offshore sourcing as a response to the simultaneous pressures to contain costs and improve quality with IT (Carmel and Agarwal 2002). Lacity, Feeny and Willcocks (2003) suggest a framework for achieving the twin goals of cost reduction and service improvement in the outsourcing of back office functions. Based on the above discussion, we hypothesize that:

\[ H3b: \quad \text{Firms with a revenue growth strategy are more likely to engage in onshore and offshore BPO.} \]

2.4 Internationalization and Offshore BPO Adoption

The internationalization of a firm may also be important in affecting its degree of offshore outsourcing. The unique capabilities of the international corporation lie in its capacity to coordinate activities on a global basis (Fayerweather 1981). The capability to coordinate the use of resources across the globe, including the external resources of partners and suppliers, is a source of competitiveness for diversified multinational corporations (Doz and Prahalad 1991). Based in part on Porter’s (1998) assertion that the ability of multinational firms to access foreign-based clusters of excellence is a source of competitive advantage, Tallman and Fladmoe-Lindquist (2002) suggest that multinational firms can leverage their existing capabilities through greater international presence. If a firm already has an international presence, it is in better position to coordinate with international partners. The firm has the capability of international management, and can more effectively evaluate and select international vendors, and manage and monitor their performance. Based on the above discussion, we hypothesize that:

\[ H4: \quad \text{Firms with greater international presence are more likely to engage in offshore BPO.} \]

2.5 IT Application Deployment and BPO Benefits

While IT application deployment enables firms to pursue BPO as discussed in section 2.1 above, IT also enables firms that outsource to receive greater quality and cost benefits from BPO. Early work in the business value of IT literature found a negative relationship between IT and product price, and a
positive relationship between IT and output quality, suggesting that IT can facilitate cost and quality improvements at the firm level (Barua, Kriebel and Mukhopadhyay 1995; Mukhopadhyay, Rajiv and Srinivasan 1997). More recent research builds on the early work to add that the first order business value impacts of IT occur at the business process level, and that these impacts include both bottom-line efficiency (cost) and top-line competitiveness (quality and revenue) (Melville, Kraemer and Gurbaxani 2004; Tallon, Kraemer and Gurbaxani 2000).

Researchers have conceptualized and empirically tested IT capability as the deployment of IT in the context of other capabilities such as business process reengineering and production process outsourcing, and found IT to be associated with both lower costs and higher quality in these contexts (Bardhan, Whitaker and Mithas 2006; Bharadwaj 2000; Devaraj and Kohli 2000). IT tools provide the capacity to transfer and access process knowledge from anywhere (Cohendent and Steinmueller 2000), thus enabling seamless functioning of business processes. Firms can leverage their IT infrastructure not only to improve individual business processes, but also to integrate and synthesize processes across physical and organizational boundaries (Basu and Blanning 2003). Overall, IT infrastructure can strengthen organizational business processes and enable new and redesigned business processes (Davenport 1993; Davenport and Short 1990; Hammer 1990). Based on the above discussion, we hypothesize that:

\[ H5: \text{Firms with broader IT application deployment are more likely to experience quality and cost benefits from BPO.} \]

2.6 Strategy Execution and BPO Benefits

The execution of a firm’s strategy is manifested in the performance measurements and practices that the firm uses to manage its internal operations and vendor relationships. Performance measures that are aligned with strategy provide information on whether the strategy is being implemented, and also encourage behaviors consistent with the strategy (Neely 1999). In performance measurement, a firm establishes measurements for a business process, and uses the measurements to control the process and influence performance in the desired direction (Powell, Schwaninger and Trimble 2001). A firm’s choice
of performance measures strongly affects the behaviors of managers and employees (Kaplan and Norton 1992). As the firm defines its performance measures and competitive priorities, the firm can dedicate additional management attention, worker training, and financial and technical support to improve performance in those areas (Fawcett, Smith and Cooper 1997).

While earlier performance measurements were based almost exclusively on financial and accounting measures, current performance measurements now also incorporate operational measures such as quality (Kaplan and Norton 1992). The inclusion of operational measures enables performance measurement to create a more comprehensive and forward-looking view, and links performance measurement more closely with business strategy (Kaplan and Norton 1996). The relationship between strategy, measurement and performance also applies in an outsourcing context, where the client uses performance measurements to link vendor performance to client strategic objectives (Anderson 1997).

Vendor management practices at various stages of the outsourcing process also contribute to the value created by outsourcing engagements (Levina and Ross 2003). Two key stages of the outsourcing process are upfront vendor selection and ongoing contract management (Trent and Monczka 2002). Two management practices associated with vendor selection are the request for proposal (RFP) and request for information (RFI) (Dai, Narasimhan and Wu 2005), and one key vendor management practice associated with contract management is the service level agreement (SLA) (Levina and Ross 2003).

Firms use requests for proposal (RFP) to generate competition among vendors and improve contract terms (Chaudhury, Nam and Rao 1995). In a utilities context, the use of RFPs with pre-specified objective criteria yielded an 18% lower contract price (Cameron 2000). In an IS outsourcing context, over 80% of firms used an RFP, and the use of RFP (including bids from the internal IT department) most frequently led to cost savings (Lacity and Willcocks 1998). Prior to issuing an RFP, the firm may need to gather additional information using a request for information (RFI) (Bernard 1997). The firm can use vendor responses to the RFI to better understand its needs and vendor capabilities, and to identify qualified vendors that may be eligible to receive an RFP.
Once the firm has selected the vendor, the firm and vendor may use a service level agreement (SLA) to specify the level of quality that will be delivered (Chan, Chandrashekhar, Richman and Vasireddy 2004). SLAs define the standards of performance, the methods of calculating performance, and the reporting procedures (Singleton, McLean and Altman 1988). SLAs are widely used in IT outsourcing engagements (Hartley 2005). SLAs benefit the firm and vendor by reducing uncertainties, clarifying expectations, and defining the quality of service that is necessary and acceptable (Levina and Ross 2003). The use of detailed SLAs is associated with longer-term outsourcing relationships and positive outcomes for the firm and vendor (Kern, Willcocks and van Heck 2002). Because a firm’s choice of performance measurements and vendor management practices demonstrates the firm’s strategy and impacts the behaviors of outsourcing providers, we hypothesize that:

**H6a:** Firms that execute a cost reduction strategy by using cost-oriented performance measurements and vendor management practices are more likely to experience cost benefits from BPO.

**H6b:** Firms that execute a high quality strategy by using quality-oriented performance measurements and vendor management practices are more likely to experience quality benefits from BPO.

We control for other relevant variables to account for alternative and complementary explanations. We control for firm size because that may influence a firm’s propensity to outsource and offshore (Ang and Straub 1998; Carmel and Nicholson 2005; Sobol and Apte 1995). We also control for industry sectors to account for differences in outsourcing across industry sectors (Brynjolfsson, Malone, Gurbaxani and Kambil 1994; Sobol and Apte 1995).

3. **RESEARCH DESIGN AND METHODOLOGY**

This study is based on data from two separate surveys conducted by *InformationWeek*, a leading and widely circulated IT publication. *InformationWeek* is considered to be a reliable source of information, and previous academic studies have also used data from *InformationWeek* surveys.
(Bharadwaj, Bharadwaj and Konsynski 1999; Rai, Patnayakuni and Patnayakuni 1997; Santhanam and Hartono 2003).

The first of the two surveys for this study, the *InformationWeek* 500 survey (IW 500), was conducted during mid 2004 (Cuneo 2004). This annual benchmarking survey targets top IT managers in large firms, and collects data on the IT department and operations, along with an overview of major IT initiatives. Two hundred and eighty firms that are publicly traded in the U.S. responded to this survey and provided complete responses to the variables of interest. Of the 280 firms, 137 represent Fortune 500 companies. IT application, process codification, and BPO-related data from this survey are used in the model for BPO antecedents.

The second survey for this study, the *InformationWeek* BPO survey (IW BPO survey), was conducted during early 2005 (Zaino 2005). This one-time survey targeted IT managers in large firms, and collected more detailed data on the specific topic of BPO within firms. Data from this survey is used in the model for BPO benefits. Fifty-one publicly traded firms that are currently using BPO responded to this survey and provided complete responses to the variables of interest. Because the IW BPO survey did not collect information on IT applications or process codification, we needed to match these firms with responses to the 2004 or 2005 IW 500 survey to link the BPO data with IT and process codification data. Of the 51 respondent firms, we were able to match data for 26 firms,\(^1\) of which 14 are Fortune 500 companies. For both surveys, we complemented the *InformationWeek* data with revenue and industry data from Compustat and Dun & Bradstreet, and offshore revenue and asset data from financial information in company annual reports and SEC 10-K and 6-K filings.\(^2\)

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\(^1\) Of the 26 firms, 10 are financial services firms, eight are services firms, seven are manufacturing firms, and one is a trade and logistics firm. We did not include the trade and logistics firm in the empirical analysis, because it was the only firm in that industry.

\(^2\) A Form 10-K is an annual report that provides a comprehensive overview of the firm’s business. A Form 6-K is a report that provides information for foreign companies that are publicly traded in the U.S.
3.1 Variable Definition

Table 1 describes the variables used in this study. Tables 2 and 3 provide descriptive statistics and correlation for our model variables. The relevant questionnaire items from the IW 500 and IW BPO surveys are included in Appendix A.

---Insert Table 1 about here---

---Insert Tables 2 and 3 about here---

Because several variables are from the InformationWeek survey, we assessed the potential concern of common method bias using Harman’s one factor test (Podsakoff and Organ 1986). For both the antecedents and outcomes models, no one general factor accounted for the majority of covariance among the measures (Podsakoff, MacKenzie, Lee and Podsakoff 2003). The routine tests for testing reliability of variables are not applicable because we use formative (i.e. summative) scales for IT application deployment, process knowledge, quality benefits and cost benefits (Diamantopoulos and Winklhofer 2001).

Table 4 provides summary statistics and correlations for the variables used in the study. For our sample of firms in the BPO antecedents model, 34% of firms use onshore BPO and 17% of firms use offshore BPO. On average, these firms have a high degree of IT infrastructure (5.7 on a scale of 0 to 8), a moderate level of business process codification (1.5 on a scale of 0 to 3), and a moderate degree of internationalization with 23% of revenues from offshore. For our sample of firms in the BPO outcomes model, the averages for IT infrastructure (5.3), business process codification (1.7), and internationalization (30%) are comparable to firms in the BPO antecedents model. Because all firms in the outcomes model are engaged in BPO, the percentage of firms that use onshore BPO (88%) and offshore BPO (68%) are higher as expected compared with firms in the antecedents model.

---Insert Table 4 about here---
3.2 Estimation Models and Econometric Issues

Because of the differences in the nature of the dependent variables onshore and offshore BPO and quality and cost benefits, we use probit and OLS respectively to estimate these models, as we describe below.

3.2.1 Antecedents Model

In our dataset, the dependent variables onshore BPO and offshore BPO appear as binary choices. The ordinary least squares approach for modeling binary dependent variables is not appropriate because of heteroskedastic error distribution, and a linear model may result in predicted probabilities below zero or above one. In addition, a linear model does not allow us to consider the non-linear effect of other continuous variables such as IT application deployment, business process codification or internationalization.

To overcome these estimation problems inherent in the ordinary least squares approach, we conducted analysis for these models using the probit approach (Greene 2000; Long 1997). For example, the multiplicative nature of the probit model allows us to assess interaction between variables without explicitly adding an interaction term in the probit model. The functional form of our empirical models is as follows:

\[
Probability (\text{Onshore BPO}=1) = \Phi [\beta X + \varepsilon] \quad (1)
\]

\[
Probability (\text{Offshore BPO}=1) = \Phi [\beta X + \varepsilon] \quad (2)
\]

where the \(X\)'s are variables such as IT application deployment, business process codification, cost reduction or revenue expansion strategy, internationalization, and the industry and revenue control variables, and \(\beta\)s are parameters for the respective variables. \(\Phi\) denotes the normal cumulative distribution function (the area under the normal curve). We test onshore and offshore BPO in separate equations, as previous research suggests that there may be some differences between onshore and offshore BPO due to differences in management culture and values (Franke, Hofstede and Bond 1998; Hofstede 1983, 1984, 1985), distance (Carmel and Agarwal 2001; Mithas and Whitaker 2006; Olson and
Olson 2000), time zones (Espinosa and Carmel 2004), and labor rates (Atkinson 2004; Brainard and Litan 2004).

3.2.2 Performance Outcomes Model

Our estimation models for quality and cost benefits from BPO are as follows:

\[
\text{Quality} = \text{Constant} + \beta_{31} \text{IT Application Deployment} + \beta_{32} \text{Business Process Codification} + \beta_{33} \\
\quad \text{Quality Strategy Execution} + \beta_{34} \text{Cost Strategy Execution} + \beta_{35} \text{Internationalization} + \beta_{36} \text{Firm Size} + \beta_{37-38} \text{Industry} + \epsilon
\]  

\[
\text{Cost} = \text{Constant} + \beta_{41} \text{IT Application Deployment} + \beta_{42} \text{Business Process Codification} + \beta_{43} \\
\quad \text{Quality Strategy Execution} + \beta_{44} \text{Cost Strategy Execution} + \beta_{45} \text{Internationalization} + \beta_{46} \text{Firm Size} + \beta_{47-48} \text{Industry} + \epsilon
\]  

We use ordinary least squares (OLS) to estimate equations (3) and (4). We tested for multicollinearity by computing condition indices. The highest variance inflation factor (VIF) was 3.25, indicating that multi-collinearity is not a serious concern in our analysis (Belsley, Kuh and Welsch 1980). We accounted for heteroskedastic error distribution and calculated heteroskedasticity consistent errors for all our models (White 1980). We also conducted a sensitivity analysis using ordered probit and found results similar to the OLS results. We interpret and discuss the OLS results in this paper, because OLS is more robust and estimates fewer parameters compared to the ordered probit approach that requires a larger sample size to reliably estimate cut-off points between intervals. We checked the normality of residuals in the OLS models using a residual plot and formal tests such as Shapiro-Wilk and Shapiro-Francia (Shapiro and Wilk 1965; Shapiro and Francia 1972). The residual plot and formal tests provided support for the normality of residuals.

4. RESULTS

Table 5 provides the results from empirical estimation of discrete choice models in equations (1) and (2). Since the probit model is inherently non-linear, the effect of each individual variable is interpreted holding all other variables at their mean values. Table 6 provides the results from OLS estimation of equations (3) and (4). Table 7 shows the hypotheses that were supported in this study.
4.1 Results: BPO Adoption

Hypothesis 1 predicted a positive association between IT application deployment and the likelihood of onshore and offshore BPO. We found support for this hypothesis in both onshore BPO ($\beta_{11} = 0.110$, $p<0.027$) and offshore BPO ($\beta_{21} = 0.099$, $p<0.075$), though the strength of the relationship with offshore BPO is only moderately significant. Consistent with hypothesis 2, we find that business process codification is associated with an increase in the likelihood of onshore BPO ($\beta_{12} = 0.286$, $p<0.002$) and offshore BPO ($\beta_{22} = 0.289$, $p<0.007$).

Hypotheses 3a and 3b tested the relationship between the strategic orientation of a firm and BPO. For hypothesis 3a, we do not find a relationship between cost reduction strategy and onshore or offshore BPO. For hypothesis 3b, we do not find a relationship between revenue growth strategy and onshore or offshore BPO. Hypothesis 4 predicted a positive association between the internationalization of a firm and offshore BPO. We do not find support for this hypothesis. We also estimated this equation using the alternative definition of international presence described in the international business literature (international assets), and did not find a statistically significant association with offshore BPO. We discuss potential explanations for this surprising result in the discussion section.

The results showing the effect of control variables on BPO also provide useful insights. Financial services firms are associated with an increased likelihood of offshore BPO ($\beta_{27} = 0.508$, $p<0.051$) compared with other industrial firms, though the strength of this relationship is only moderately significant. This finding is corroborated by the observation that large financial services organizations such as GE Capital were among the first to engage in large-scale offshore initiatives. While firms are not required to disclose specific BPO relationships, the National Association of Software and Service Companies (NASSCOM) reports that American Express, AXA, Fidelity, GE Capital, HSBC and Standard Chartered Bank have some of the largest remote services operations in India (www.nasscom.org).
We also find that large firms tend to engage in both onshore BPO ($\beta_{16} = 0.232, p<0.001$) and offshore BPO ($\beta_{26} = 0.258, p<0.001$) with greater likelihood than small firms. This finding is consistent with the theory that slack resources and economies of scale facilitate large firms to adopt technology innovations (Dewar and Dutton 1986; Mock and Morse 1977).

4.2 Results: BPO Benefits

Hypothesis 5 predicted a positive association between IT application deployment and cost and quality benefits from BPO. We found support for this hypothesis in both cost benefits ($\beta_{31}=0.296, p<0.023$) and quality benefits ($\beta_{41}=0.317, p<0.005$). Hypotheses 6a tested the relationship between cost strategy execution and BPO cost benefits, and hypothesis 6b tested the relationship between quality strategy execution and BPO quality benefits. While hypothesis 6a was not supported, we did find support for hypothesis 6b ($\beta_{44}=0.577, p<0.000$).

Results showing the effects of control variables on BPO cost and quality benefits also provide useful insights. Compared with the manufacturing industry, the financial services ($\beta_{47}=1.287, p<0.011$) and services ($\beta_{48}=1.114, p<0.040$) industries both receive higher quality benefits from BPO. This may help to explain why firms in these industries are adopting BPO more broadly than firms in other industries. While not hypothesized in this paper, we note that the execution of a quality strategy is associated with BPO cost benefits ($\beta_{33}=0.275, p<0.033$), perhaps suggesting that similar to the software development context, the upfront quality of business processes prevents rework and waste, which subsequently saves cost and time (Harter, Krishnan and Slaughter 2000; Krishnan, Kriebel, Kekre and Mukhopadhyay 2000).

5. DISCUSSION AND CONCLUSION

Our goal in this paper was to study the antecedents and performance outcomes of onshore and offshore business process outsourcing (BPO). We developed our theoretical model by drawing on previous research in transaction cost economics, business process management, strategy and international business. We obtained archival data from InformationWeek on IT application deployment and business
process codification for a sample of firms publicly traded in the U.S. We complemented this data with financial information on revenues and offshore revenues and assets from Compustat, Dun & Bradstreet, SEC filings and annual reports. To study cost and quality performance outcomes of BPO, we obtained archival data from *InformationWeek* on BPO for a separate sample of firms publicly traded in the U.S.

5.1 Findings

Consistent with our expectations, we find that a broader IT application deployment is associated with an increased likelihood of both onshore BPO and offshore BPO. As a firm strengthens its IT infrastructure by deploying applications such as enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM), the firm is better able to integrate the outcomes of BPO providers back into its core business operations. Particularly with offshore BPO where frequent face-to-face contact between the client and the vendor is not realistic, a strong IT infrastructure is important for the firm to monitor the vendor and integrate BPO outcomes back into its core business operations.

We also find that business process codification is associated with an increased likelihood of both onshore BPO and offshore BPO. As a firm develops its process codification, the firm is better able to identify potential processes as candidates for outsourcing, scope projects, select vendors, and monitor and evaluate vendor performance. Similar to IT application deployment above, process codification gives the firm increased confidence to proceed with BPO, and reduces the likelihood of disruption as various processes are placed with outside vendors. The finding that process codification is associated with both onshore and offshore BPO suggests that a solid understanding of business processes may be a prerequisite for firms to successfully engage in BPO.

We did not find a statistically significant relationship between a firm’s degree of internationalization and the likelihood of offshore BPO. Although surprising, one reason for this null finding may be the imperfect measurement of internationalization. Although we operationalized our internationalization variables following previous studies, these variables may not truly represent the internationalization of a firm. Consider two examples.
Affiliated Computer Services (NYSE: ACS) is a provider of technology services based in Dallas, Texas. ACS does a significant portion of its business with US federal, state and local government entities, and accordingly 99%+ of its revenue is considered US domestic revenue. According to the traditional revenue measure, ACS is considered almost entirely a domestic firm. However, a close examination of the ACS 10-K SEC filing shows that 10,000 of ACS’ 40,000 employees are based in foreign countries such as India, Ireland and China. Clearly, ACS has an extensive international presence that is not captured by the traditional revenue and asset measures.

Footstar (NYSE: FTAR) is a footwear retailer based in Mahwah, New Jersey. Footstar operates only in the US and Canada. Using the traditional measures of revenues or assets, Footstar would also be considered a North American firm. Again however, a close examination of the Footstar 10K SEC filing shows that over 90% of the shoes sold by Footstar’s largest business segment are manufactured in China. Yet, Footstar is not considered an international company using the traditional measures.

The examples of ACS and Footstar, which have significant offshore employees and suppliers (respectively) yet have very low offshore revenues and assets, raise question whether offshore revenues or assets are the most appropriate indicators of internationalization. The SEC does not require reporting for offshore employees and/or offshore supplier relationships, so from publicly-available data we are unable to evaluate whether these measures would produce findings consistent with the original hypothesis. There is a need to develop alternative and better measures of internationalization to further examine the relationship between internationalization and BPO. Other researchers have also noted the need for alternative measures of internationalization (Hassel, Hopner, Kurdelbusch, Rehder and Zugehor 2003; Lynch and Clayton 2003).

Turning to the cost and quality outcomes of BPO, we find that IT application deployment is positively associated with both cost and quality benefits from BPO. Similar to the discussion above, this finding suggests that strong IT infrastructure may help firms to overcome the geographical and temporal barriers involved in dealing with outside BPO vendors. Broader IT application deployment enables the firm to better monitor its business operations, identify exceptions upfront, and seamlessly integrate the
outcomes back into its internal operations, which reduces the cost and increases the quality of critical business processes placed with outside vendors.

We also find that quality-oriented performance measurement and vendor management practices are associated with both quality and cost benefits from BPO. Similar to the software development context, this suggests that the upfront quality of business processes prevents rework and waste, which subsequently saves cost and time (Harter, Krishnan and Slaughter 2000; Krishnan, Kriebel, Kekre and Mukhopadhyay 2000). While many firms initially pursue BPO from a cost motivation, this suggests that similar to the manufacturing outsourcing context, BPO providers may be able to leverage their technological resources, scale and skills to deliver higher quality services (Bardhan, Whitaker and Mithas 2006).

5.2 Limitations

There are three primary limitations of this study, the first two of which are associated with the nature of the onshore and offshore BPO variables used for empirical analysis in the antecedents model. First, we used dichotomous measures of onshore and offshore BPO in this study. Loh and Venkatraman (1992) suggest that as outsourcing relationships grow more varied and complex, a richer description becomes necessary. The extent to which firms outsource business processes differs across firms. While some firms may outsource only a small number of business processes in certain subsidiaries, other firms may outsource a larger number of business processes across the firm. Similarly, some firms may have BPO as only a small part of their operational strategy, dedicating limited managerial and financial resources to BPO initiatives; while other firms may have BPO as a significant component of their global sourcing strategy, dedicating significant managerial and financial resources to BPO initiatives. Future studies can address this limitation by gathering a richer description of the extent of BPO within a firm, both in terms of the number of business processes outsourced and the proportion to which each process is outsourced.

Second, even though the IW 500 survey respondents are senior-level executives and senior-level executives are known to have the most comprehensive view of company operations, there are at least two
reasons why the respondent may not have been able to record the offshore BPO variable correctly. First, the respondent may misunderstand the actual nature of the location where outsourced work is taking place. For example, because certain countries such as the US have stronger technical and political institutions (Reinhard, Palvia, Gricar, Gupta and Kaul 1997), there may be an incentive for US companies to formalize BPO contracts at headquarters even if services will be provided by offshore vendor employees. Second, respondents may have been reluctant to disclose that their companies were engaging in offshore BPO, given the political sensitivity to the offshoring issue during the mid-2004 timeframe of the survey (Economist 2004). Future studies can address this limitation by validating a firm’s use of onshore and offshore BPO using internal and external sources.

The third limitation involves the relatively small number of observations for the performance outcomes models. While this number is toward the lower bound of the number of observations required for valid OLS models, it is similar to the number of observations used to assess cost and quality outcomes in other IS research (Harter, Krishnan and Slaughter 2000; Krishnan, Kriebel, Kekre and Mukhopadhyay 2000). Nevertheless, it will be important for future research to validate the findings on performance outcomes from BPO using a larger sample size.

5.3  **Implications and Future Research**

This study makes two primary contributions to the emerging literature on BPO (Dutta and Roy 2005; Feeny, Lacity and Willcocks 2005; Lacity, Feeny and Willcocks 2003). First, we draw on previous research in transaction cost economics, business process management, strategy and international business to develop and validate a theoretical model for antecedents and performance outcomes of BPO. We extend previous research to understand the relationship between organization characteristics and adoption and benefits of the emerging practice of onshore and offshore BPO. Second, we establish a link between IT application deployment and BPO adoption and performance outcomes. This link highlights and validates the role that IT plays in facilitating outsourcing, and in facilitating quality benefits and cost benefits from BPO.
Though our study develops and tests a theoretical model of antecedents of onshore and offshore BPO, there are at least three opportunities to extend this work. Consistent with the discussion above on the use of dichotomous measures in this study, it would be helpful to understand the effect of IT infrastructure, business process codification and strategic orientation on the extent of BPO within a firm. Second, the results of our findings on the relationship between offshore revenues and assets and offshore BPO shows that there is a need for future research to examine the effect of internationalization on BPO. While U.S. publicly traded firms are not required to report data on offshore employees and offshore suppliers in SEC filings, these data would offer some promise in understanding the relationship between a firm’s international presence and offshore BPO.

Third, while many firms pursue BPO with the belief that BPO will reduce costs and enable the firm to focus on its core business operations, firms may also be able to use BPO to boost innovation by accessing a more skilled workforce and advanced technologies (Carmel and Agarwal 2002; King 2006; Prahalad and Krishnan 2004). There is a need for future research to explicitly consider other outcomes of BPO including measures such as enhanced innovation capability, speed and agility. Fourth, while our adoption and performance findings did not differentiate between onshore and offshore BPO, previous research suggests that there may be differences between onshore and offshore BPO due to differences in management culture and values (Franke, Hofstede and Bond 1998; Hofstede 1983, 1984, 1985), distance (Carmel and Agarwal 2001; Mithas and Whitaker 2006; Olson and Olson 2000), time zones (Espinosa and Carmel 2004), and labor rates (Atkinson 2004; Brainard and Litan 2004). It will be important for future research to focus on and highlight the potential differences between outsourcing onshore and offshore.

This study also has at least three implications for managers. First, from a BPO vendor perspective, as vendors make increased investments to deliver BPO services from onshore and offshore locations, they will be competing for the client firms that would establish mutually beneficial relationships. Vendors will want to identify firms that are prepared to field successful BPO engagements, and will need to know the characteristics of these firms. A prepared client firm can reduce problems in
the BPO implementation, and simultaneously reduce the workload of BPO vendors and lead to more positive outcomes. Our study indicates that vendors should focus their marketing efforts on firms with broad IT application deployment and business process codification, and suggests that these firms may more likely to produce successful mutually beneficial BPO relationships.

Second, because IT application deployment is positively associated with increased likelihood of onshore and offshore BPO, a firm considering BPO must evaluate its IT infrastructure. A strong IT infrastructure would give the firm more confidence that it can successfully connect with the BPO vendor to integrate BPO outcomes back into its core business operations. A weak IT infrastructure would indicate that the firm may need to make some internal investments prior to pursuing BPO. Third and finally, firms must also evaluate their understanding of the business process to be outsourced, because process codification is associated with an increased likelihood of onshore and offshore BPO. Good documentation and understanding of the business process would give the firm confidence that it can properly identify and scope the BPO project, and select and evaluate the BPO vendor. In contrast, a poor understanding of the process may put the firm in a disadvantageous position, where it may not be able to properly identify the project or the vendor, and may be subject to suboptimal vendor performance and/or financial savings.

To conclude, this paper empirically tests the effect of IT application deployment, business process codification, strategic orientation and internationalization on onshore and offshore business process outsourcing. We find a positive relationship between IT application deployment and business process codification, and onshore and offshore BPO. We also find a positive relationship between IT application deployment and cost and quality benefits from BPO. These results suggest that firms with strong IT infrastructure and business process codification are more likely to use BPO, and that firms with strong IT infrastructure are more likely to achieve business value from BPO. These findings are important as firms more broadly incorporate BPO into their global sourcing strategies.
<table>
<thead>
<tr>
<th>Variable</th>
<th>Description</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onshore BPO</td>
<td>Binary variable indicating whether the firm conducts onshore business process outsourcing.</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Offshore BPO</td>
<td>Binary variable indicating whether the firm conducts offshore business process outsourcing.</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Cost Benefits</td>
<td>Four item formative index indicating the cost-related benefits a firm receives from BPO. Cost benefits covered by the index are reduced operation costs, more predictable costs, lower prices on products and services, and labor arbitrage/savings.</td>
<td>IW BPO survey</td>
</tr>
<tr>
<td>Quality Benefits</td>
<td>Four item formative index indicating the quality-related benefits a firm receives from BPO. Quality benefits covered by the index are process improvement/transformation, ability to focus attention/resources on more critical issues, more skilled workforce, and higher customer satisfaction.</td>
<td>IW BPO survey</td>
</tr>
<tr>
<td>IT Application</td>
<td>Eight item formative index indicating the deployment of IT systems in a firm. IT systems covered by the index are enterprise resource planning, supply chain management, customer relationship management, data warehouse, business intelligence, web services, content management, and product lifecycle management.</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Business Process</td>
<td>Three item formative index indicating the extent to which a firm’s business processes are codified. Codification is indicated by whether a firm defined its business processes, deployed business process management software, and modeled business processes using CASE or related tool</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Codification</td>
<td>Cost Reduction Strategy indicates that the firm’s business technology over the past 12 months has been primarily focused on cost cutting and streamlining operations. Base category is hybrid strategy (same emphasis on cost cutting and new revenue).</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Revenue Growth</td>
<td>Indicates that the firm’s business technology over the past 12 months has been primarily focused on generating new revenue. Base category is hybrid strategy.</td>
<td>IW 500 survey</td>
</tr>
<tr>
<td>Cost Strategy</td>
<td>Four item formative index indicating the firm’s focus on cost reduction in its strategy execution. Cost reduction items covered by the index are use of request for information (RFI) and request for proposal (RFP) prior to establishing BPO relationships, and measurement of success in BPO/IT outsourcing efforts using cost reduction and headcount/full-time employee metrics.</td>
<td>IW BPO survey</td>
</tr>
<tr>
<td>Execution</td>
<td>Quality Strategy Execution indicates the firm’s focus on quality in its strategy execution. Cost reduction items covered by the index are use of service level agreements (SLAs) with vendors, and measurement of success in BPO/IT outsourcing efforts using revenue growth, process performance levels, customer satisfaction levels, and Six Sigma key performance indicators.</td>
<td>IW BPO survey</td>
</tr>
<tr>
<td>Internationalization</td>
<td>Percentage of firm revenue from outside North America. We also use percentage of firm assets outside North America as an alternate measure of internationalization.</td>
<td>SEC filings, annual reports</td>
</tr>
<tr>
<td>Firm Size</td>
<td>Natural log of annual firm revenue.</td>
<td>Compustat, Dun &amp; Bradstreet</td>
</tr>
<tr>
<td>Industry</td>
<td>Control for primary industry sectors – finance, services, trade and logistics, and other industrial. Base category is manufacturing firms. Industry groupings based on North American Industry Classification System (NAICS) codes. Performance outcomes models include only finance, services and manufacturing firms.</td>
<td>Compustat, Dun &amp; Bradstreet</td>
</tr>
</tbody>
</table>
Table 2: Descriptive Statistics and Correlations for Variables in Antecedents Models  
(n=280)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
<th>Min</th>
<th>Max</th>
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<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
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</thead>
<tbody>
<tr>
<td>Onshore BPO</td>
<td>0.34</td>
<td>0.47</td>
<td>0.00</td>
<td>1.00</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Offshore BPO</td>
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<td>0.37</td>
<td>0.00</td>
<td>1.00</td>
<td>0.41*</td>
<td>1.00</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>IT Deployment</td>
<td>5.66</td>
<td>1.66</td>
<td>0.00</td>
<td>8.00</td>
<td>0.15*</td>
<td>0.13*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Process Codification</td>
<td>1.45</td>
<td>0.89</td>
<td>0.00</td>
<td>3.00</td>
<td>0.24*</td>
<td>0.22*</td>
<td>0.19*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Cost Strategy</td>
<td>0.33</td>
<td>0.47</td>
<td>0.00</td>
<td>1.00</td>
<td>-0.06</td>
<td>-0.07</td>
<td>-0.15*</td>
<td>-0.11</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revenue Strategy</td>
<td>0.13</td>
<td>0.34</td>
<td>0.00</td>
<td>1.00</td>
<td>0.01</td>
<td>0.02</td>
<td>0.05</td>
<td>0.02</td>
<td>-0.27*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Internationalization</td>
<td>0.23</td>
<td>0.25</td>
<td>0.00</td>
<td>0.94</td>
<td>-0.10</td>
<td>-0.01</td>
<td>0.16*</td>
<td>-0.10</td>
<td>0.00</td>
<td>-0.11</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Firm Size</td>
<td>8.48</td>
<td>1.17</td>
<td>6.20</td>
<td>12.11</td>
<td>0.21*</td>
<td>0.24*</td>
<td>0.18*</td>
<td>0.11</td>
<td>-0.08</td>
<td>0.08</td>
<td>0.18*</td>
<td>1.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finance</td>
<td>0.13</td>
<td>0.33</td>
<td>0.00</td>
<td>1.00</td>
<td>0.12*</td>
<td>0.18*</td>
<td>-0.13*</td>
<td>0.14*</td>
<td>-0.17*</td>
<td>0.11</td>
<td>-0.12*</td>
<td>0.15*</td>
<td>1.00</td>
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<tr>
<td>Services</td>
<td>0.20</td>
<td>0.40</td>
<td>0.00</td>
<td>1.00</td>
<td>-0.05</td>
<td>-0.03</td>
<td>-0.04</td>
<td>0.11</td>
<td>-0.14*</td>
<td>0.02</td>
<td>-0.06</td>
<td>-0.16*</td>
<td>-0.19*</td>
<td>1.00</td>
<td></td>
</tr>
<tr>
<td>Trade and Logistics</td>
<td>0.17</td>
<td>0.38</td>
<td>0.00</td>
<td>1.00</td>
<td>-0.00</td>
<td>-0.08</td>
<td>0.01</td>
<td>-0.07</td>
<td>-0.07</td>
<td>0.10</td>
<td>-0.17*</td>
<td>0.02</td>
<td>-0.17*</td>
<td>-0.23*</td>
<td>1.00</td>
</tr>
<tr>
<td>Other Industrial</td>
<td>0.11</td>
<td>0.31</td>
<td>0.00</td>
<td>1.00</td>
<td>0.02</td>
<td>-0.00</td>
<td>-0.12*</td>
<td>0.02</td>
<td>0.18*</td>
<td>-0.03</td>
<td>-0.18*</td>
<td>0.04</td>
<td>-0.13*</td>
<td>-0.17*</td>
<td>-0.16*</td>
</tr>
</tbody>
</table>

* Correlation significant at p<0.05

Table 3: Descriptive Statistics and Correlations for Variables in Performance Outcomes Models  
(n=25)

| Variable                  | Mean  | SD    | Min  | Max  | 1     | 2     | 3     | 4     | 5     | 6     | 7     | 8     | 9     |
|---------------------------|-------|-------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Cost Benefits             | 2.16  | 1.18  | 0.00 | 4.00 | 1.00  |       |       |       |       |       |       |       |       |       |
| Quality Benefits          | 1.56  | 1.19  | 0.00 | 4.00 | 0.20  | 1.00  |       |       |       |       |       |       |       |       |
| IT Deployment             | 5.32  | 1.89  | 1.00 | 8.00 | 0.43* | 0.16  | 1.00  |       |       |       |       |       |       |       |
| Process Codification      | 1.72  | 1.14  | 0.00 | 3.00 | -0.06 | -0.06 | 0.33  | 1.00  |       |       |       |       |       |       |
| Cost Execution            | 2.84  | 1.03  | 0.00 | 4.00 | 0.19  | -0.37 | 0.07  | 0.07  | 1.00  |       |       |       |       |       |
| Quality Execution         | 2.92  | 1.38  | 1.00 | 5.00 | 0.24  | 0.53* | -0.05 | 0.09  | 0.14  | 1.00  |       |       |       |       |
| Internationalization     | 0.30  | 0.24  | 0.00 | 0.79 | -0.04 | 0.09  | 0.32  | 0.01  | 0.04  | -0.07 | 1.00  |       |       |       |       |
| Firm Size                 | 9.56  | 1.60  | 7.12 | 12.17| 0.28  | -0.05 | 0.47* | 0.29  | -0.19 | -0.22 | 0.31  | 1.00  |       |       |       |
| Finance                   | 0.40  | 0.50  | 0.00 | 1.00 | 0.17  | -0.11 | -0.27 | -0.09 | 0.13  | -0.07 | -0.42* | 0.04  | 1.00  |       |       |
| Services                  | 0.32  | 0.48  | 0.00 | 1.00 | -0.32 | 0.04  | -0.21 | -0.06 | 0.11  | 0.04  | -0.08 | -0.36 | -0.56*|       |       |

* Correlation significant at p<0.05
<table>
<thead>
<tr>
<th>Parameter</th>
<th>(1) Onshore BPO (Probit)</th>
<th>(2) Offshore BPO (Probit)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Application Deployment</td>
<td>( \beta_{11} = 0.110^{**} ) [0.027]</td>
<td>( \beta_{21} = 0.099^{*} ) [0.075]</td>
</tr>
<tr>
<td>Process Codification</td>
<td>( \beta_{12} = 0.286^{***} ) [0.002]</td>
<td>( \beta_{22} = 0.289^{***} ) [0.007]</td>
</tr>
<tr>
<td>Cost Reduction Strategy</td>
<td>( \beta_{13} = -0.023 ) [0.452]</td>
<td>( \beta_{23} = -0.039 ) [0.434]</td>
</tr>
<tr>
<td>Revenue Growth Strategy</td>
<td>( \beta_{14} = -0.150 ) [0.275]</td>
<td>( \beta_{24} = -0.061 ) [0.416]</td>
</tr>
<tr>
<td>Internationalization</td>
<td>( \beta_{15} = -0.878^{**} ) [0.013]</td>
<td>( \beta_{25} = -0.272 ) [0.270]</td>
</tr>
<tr>
<td>Firm Size</td>
<td>( \beta_{16} = 0.232^{***} ) [0.001]</td>
<td>( \beta_{26} = 0.258^{***} ) [0.001]</td>
</tr>
<tr>
<td>Finance</td>
<td>( \beta_{17} = 0.228 ) [0.215]</td>
<td>( \beta_{27} = 0.508^{*} ) [0.051]</td>
</tr>
<tr>
<td>Services</td>
<td>( \beta_{18} = -0.129 ) [0.295]</td>
<td>( \beta_{28} = 0.033 ) [0.454]</td>
</tr>
<tr>
<td>Trade and Logistics</td>
<td>( \beta_{19} = -0.024 ) [0.462]</td>
<td>( \beta_{29} = -0.275 ) [0.197]</td>
</tr>
<tr>
<td>Other Industrial</td>
<td>( \beta_{19-1} = -0.006 ) [0.492]</td>
<td>( \beta_{29-1} = 0.017 ) [0.481]</td>
</tr>
<tr>
<td>Constant</td>
<td>( \beta_{10} = -3.248^{***} ) [0.000]</td>
<td>( \beta_{20} = -4.204^{***} ) [0.000]</td>
</tr>
</tbody>
</table>

Observations: 280
Prob > Chi-square: 0.000
Pseudo R-squared: 0.104

p values in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1% (all one tailed)
Table 5: Parameter Estimates for Performance Outcomes Models

<table>
<thead>
<tr>
<th></th>
<th>(3) Cost Benefits (OLS)</th>
<th>(4) Quality Benefits (OLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>IT Application Deployment</td>
<td>$\beta_{31}$ 0.296**</td>
<td>$\beta_{41}$ 0.317***</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>Process Codification</td>
<td>$\beta_{32}$ -0.354*</td>
<td>$\beta_{42}$ -0.137</td>
</tr>
<tr>
<td></td>
<td>(0.062)</td>
<td>(0.176)</td>
</tr>
<tr>
<td>Cost Strategy Execution</td>
<td>$\beta_{33}$ 0.238</td>
<td>$\beta_{43}$ -0.751***</td>
</tr>
<tr>
<td></td>
<td>(0.223)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Quality Strategy Execution</td>
<td>$\beta_{34}$ 0.275**</td>
<td>$\beta_{44}$ 0.577***</td>
</tr>
<tr>
<td></td>
<td>(0.033)</td>
<td>(0.000)</td>
</tr>
<tr>
<td>Internationalization</td>
<td>$\beta_{35}$ -1.154</td>
<td>$\beta_{45}$ 1.606**</td>
</tr>
<tr>
<td></td>
<td>(0.189)</td>
<td>(0.044)</td>
</tr>
<tr>
<td>Firm Size</td>
<td>$\beta_{36}$ 0.210</td>
<td>$\beta_{46}$ -0.130</td>
</tr>
<tr>
<td></td>
<td>(0.108)</td>
<td>(0.163)</td>
</tr>
<tr>
<td>Finance</td>
<td>$\beta_{37}$ 0.172</td>
<td>$\beta_{47}$ 1.287**</td>
</tr>
<tr>
<td></td>
<td>(0.419)</td>
<td>(0.011)</td>
</tr>
<tr>
<td>Services</td>
<td>$\beta_{38}$ -0.365</td>
<td>$\beta_{48}$ 1.114**</td>
</tr>
<tr>
<td></td>
<td>(0.316)</td>
<td>(0.040)</td>
</tr>
<tr>
<td>Constant</td>
<td>$\beta_{39}$ -1.904</td>
<td>$\beta_{49}$ 0.447</td>
</tr>
<tr>
<td></td>
<td>(0.109)</td>
<td>(0.372)</td>
</tr>
<tr>
<td>Observations</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Prob &gt; F</td>
<td>0.028</td>
<td>0.000</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.487</td>
<td>0.675</td>
</tr>
</tbody>
</table>

Robust p values in parentheses
* significant at 10%; ** significant at 5%; *** significant at 1% (all one tailed)
1 Ordered probit yields similar results

Table 6: Summary of Hypotheses Supported by Study

<table>
<thead>
<tr>
<th>Hypothesis Description</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 IT deployment → Onshore and Offshore BPO</td>
<td>Yes*</td>
</tr>
<tr>
<td>2 BP codification → Onshore and Offshore BPO</td>
<td>Yes</td>
</tr>
<tr>
<td>3a Cost strategy → Onshore and Offshore BPO</td>
<td>No</td>
</tr>
<tr>
<td>3b Revenue strategy → Onshore and Offshore BPO</td>
<td>No</td>
</tr>
<tr>
<td>4 Internationalization → Offshore BPO</td>
<td>No</td>
</tr>
<tr>
<td>5 IT deployment → Cost and Quality benefits</td>
<td>Yes</td>
</tr>
<tr>
<td>6a Cost execution → Cost benefits</td>
<td>No</td>
</tr>
<tr>
<td>6b Quality execution → Quality benefits</td>
<td>Yes</td>
</tr>
</tbody>
</table>

* One of the two equations for this hypothesis is moderately statistically significant
References


Reinhard, N., Palvia, P., Gricar, J., Gupta, A., and Kaul, M. "Panel: What is different with information technology implementation in less developed countries and why should we care?" *Proceedings of


### Variable | Questionnaire Items
---|---
**Onshore / Offshore BPO** | What forms of outside consulting or IT services does your organization currently use? (*choose all that apply*) Selections include:
- Business process outsourcing (onshore)
- Business process outsourcing (offshore)

**Cost and Quality Benefits** | What benefits, if any, has your company already seen from its BPO outsourcing efforts? (*choose all that apply*) Selections include (author categories in parentheses):
- Reduced operations costs (cost)
- More predictable costs (cost)
- Lower prices on products and services (cost)
- Labor arbitrage / savings (cost)
- Process improvement / transformation (quality)
- Ability to focus attention/resources on more critical issues (quality)
- More skilled workforce (quality)
- Higher customer satisfaction (quality)

**IT Application Deployment** | Which of the following products or technologies are widely deployed in your organization? (*choose all that apply*) Selections include:
- ERP
- Supply chain planning
- CRM systems
- Data warehouse
- Business intelligence
- Web services
- Content management
- Product lifecycle management

**Business Process Codification** | Formative index drawn from three questions:
- What steps has your organization taken to optimize the efficiency of its technology processes in the past 12 months? (*choose all that apply*) Selections include:
  - Defined business processes
- Which of the following products or technologies are widely deployed in your organization? (*choose all that apply*) Selections include:
  - Business process management software
- Which of the following are the most effective technology steps managers in your organization have made in the past 12 months to raise company productivity? (*choose all that apply*) Selections include:
  - Modeled business processes using CASE or related tool

**Cost Reduction and Revenue Growth Strategy** | Has your organization's business-technology strategy in the past 12 months been primarily focused on generating new revenue, or on cost cutting and streamlining operations? (*choose one*)
- Generating new revenue
- Cost cutting / streamlining operations
- About the same emphasis on both
### Appendix A: *InformationWeek* Questionnaire Items (continued)

<table>
<thead>
<tr>
<th>Cost Strategy Execution</th>
<th>Formative index drawn from two questions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did your organization conduct a RFP, RFI or some other comparative sourcing technique prior to establishing its BPO relationships? <em>(choose one)</em> Selections include:</td>
</tr>
<tr>
<td></td>
<td>• RFP (Request for Proposal)</td>
</tr>
<tr>
<td></td>
<td>• RFI (Request for Information)</td>
</tr>
<tr>
<td></td>
<td>• Both</td>
</tr>
<tr>
<td></td>
<td>• Neither</td>
</tr>
<tr>
<td>How does your organization measure the success of its business/IT process outsourcing efforts? <em>(choose all that apply)</em> Selections include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Cost reduction</td>
</tr>
<tr>
<td></td>
<td>• Headcount / full-time employees</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Quality Strategy Execution</th>
<th>Formative index drawn from two questions:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Did your organization establish hard or measurable service performance metrics in its vendor service level agreements (SLAs)? <em>(choose one)</em> Selections include:</td>
</tr>
<tr>
<td></td>
<td>• Yes, SLA with metrics</td>
</tr>
<tr>
<td></td>
<td>• Yes, SLA with no metrics</td>
</tr>
<tr>
<td></td>
<td>• No SLAs</td>
</tr>
<tr>
<td>How does your organization measure the success of its business/IT process outsourcing efforts? <em>(choose all that apply)</em> Selections include:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Revenue growth</td>
</tr>
<tr>
<td></td>
<td>• Process performance levels</td>
</tr>
<tr>
<td></td>
<td>• Six Sigma KPIs</td>
</tr>
<tr>
<td></td>
<td>• Customer satisfaction levels</td>
</tr>
</tbody>
</table>