Organizational Learning and Organizational Capabilities of Firms that Engage in Onshore and Offshore Business Process Outsourcing

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Abstract

Firms are increasingly using onshore and offshore business process outsourcing (BPO) to manage their front and back office functions. While most IS research uses transaction cost economics (TCE) to study the transaction-level characteristics that facilitate outsourcing, to advance theory there is a need to focus on the firm-level characteristics that facilitate onshore and offshore BPO. This paper builds on prior research in organizational learning and organizational capabilities to propose a theoretical framework for adoption of onshore and offshore BPO, and tests the framework using archival data.

1. Introduction

Firms are increasingly utilizing onshore and offshore business process outsourcing (BPO) to manage their front and back office functions [71, 89, 91]. In BPO, a firm delegates one or more business processes to be managed and delivered by an external vendor, in an effort to achieve cost, quality and/or cycle time improvements in the outsourced processes [39].

Despite significant growth in the outsourcing of business processes, very little is known about firm-level characteristics that facilitate BPO. Most prior IT outsourcing research follows the precepts of transaction cost economics (TCE), in which organization form and firm boundaries are primarily a function of transaction-level characteristics [6, 46, 68, 95, 96]. Building on IT outsourcing research, BPO research has provided useful insights on the characteristics of business processes that make them amenable for outsourcing / offshoring and on best practices to manage BPO engagements [7, 9, 30, 39, 71, 89]. While this BPO research has significantly expanded our understanding, most of this work has used a transaction or process as the dominant unit of analysis consistent with TCE.

While transaction-level characteristics certainly influence firm boundaries, the Strategy literature asserts that firm-level characteristics also play an important role to influence organization form [64]. This assertion is based on the foundation that firms differ significantly in strategies and capabilities [13, 93], and firm-specific knowledge often drives firm boundary decisions [27, 61]. Even within the same industry firms differ dramatically in their sourcing decisions, and these differences are driven by pre-existing strengths, weaknesses, learning and capabilities across firms [60, 64]. Therefore, there is a need to complement and extend prior TCE transaction-level work on BPO using firm-level characteristics.

In this paper, we build on previous research in organizational learning and organizational capabilities to develop a theoretical model for the firm-level characteristics that facilitate onshore and offshore BPO. We validate the theoretical model by conducting an empirical study using archival data on a broad cross-section of firms publicly traded in the U.S. We find that firms that have learned to coordinate vendor relationships through IT outsourcing are more likely to engage in BPO, and firms that have learned to coordinate international relationships through IT offshoring and internationalization are more likely to engage in offshore BPO. We also find that firms with systems capabilities related to IT coordination applications and process capabilities related to codification are more likely to engage in onshore and offshore BPO.

2. Theory and research model

2.1. Organizational learning

In the knowledge-based view of the firm, organizational knowledge acts as a foundation for creating organizational capabilities that provide a source of competitive advantage [43]. Firms acquire knowledge through learning by making associations between past actions, the effectiveness of those actions, and future actions [40, 56]. Organizational capabilities are developed through a process of interpreting past organizational experience as a basis for present and
future action, and through learning and fine-tuning the day-to-day activities in the firm [58].

Routines, or programs of action that reflect the prior experience of an organization with a particular activity [32, 67], play a key role in organizational learning. As an organization gains experience with an activity, the organization develops routines associated with the activity [74]. As a routine develops, organizations repeatedly engage in similar activities and improve the routine. Once a routine is established, the routine will guide subsequent organizational behavior [74]. The organization gains confidence and expertise in the routine, which increases the probability that the organization will repeat the routine in the future [47, 51]. Because organizational learning is generally incremental and occurs in areas close to previous experience, current actions and decisions tend to replicate those made in similar contexts in the past [25, 32, 66]. For example, a firm that acquires other firms develops routines associated with making acquisitions. As a firm gains acquisition experience, the firm is more likely to make subsequent acquisitions, and a firm that makes acquisitions of a particular type is more likely to subsequently make the same type of acquisition [3, 51].

The concepts of organizational learning and routines apply to the inter-firm context, as illustrated by the literature on alliances and sourcing [37, 48, 64]. Similar to BPO, alliances are inter-firm relationships that require detailed assessments and multiple levels of approval to ratify contracts, and considerable management attention to govern relationships [37, 59]. Also similar to BPO, in alliances critical resources span firm boundaries through inter-firm processes and the complementary resources of partners [38, 87]. Organizations learn to manage internal actions and inter-firm relationships [98]. Once a firm begins to collaborate with alliance partners, the firm develops experience in cooperation and partnering [22, 57]. Based on this experience, the firm develops an understanding of the types of alliances that would be beneficial, and the knowledge to identify alliance opportunities, form alliance relationships, establish mechanisms and safeguards to manage alliance relationships, and transfer information to and from alliance partners [38, 58]. Prior alliance experience results in more opportunities to enter into future alliances [47]. As firms accumulate experience in managing alliances, they learn to manage alliances more effectively and achieve greater alliance success [4, 58].

Similar to alliances, prior sourcing experience contributes to the development of organizational routines that enable firms to collaborate with a range of partners [64]. These routines include learning related to managing contractual aspects and other mechanisms to enhance coordination between client and vendor [72]. Experienced firms can more effectively identify and select trustworthy suppliers, negotiate and organize relationships, monitor and enforce terms, and anticipate and respond to contingencies based on learning from prior sourcing engagements [77]. Firms with greater sourcing experience are more likely to outsource, because they have learned the administrative routines that enhance their abilities to engage in successful sourcing partnerships [64].

We extend the concept of organizational learning from the inter-firm alliance and sourcing contexts to the inter-firm business process outsourcing context. BPO requires the client firm to perform a set of routines. The client firm must identify and negotiate with a qualified vendor, and monitor, coordinate, communicate and exchange information throughout the BPO relationship. For business processes with high interdependence and complexity, the client firm must anticipate and respond to contingencies that are difficult to define in a formal contact. Organizations with experience in outsourcing another corporate function will have learned to perform these routines for BPO.

While the IT function is separate from other front and back office functions related to BPO [89, 94], IT outsourcing shares some characteristics with BPO including the need to coordinate a vendor relationship and the underlying complexity of software and business processes [11, 36]. These characteristics suggest that organizations can apply learning from IT outsourcing to engage in BPO. Another shared characteristic is that IT outsourcing and BPO can be delivered via domestic resources or international resources [21, 76]. Research in the alliance context suggests that because domestic and international alliances both facilitate the learning of partnering skills, domestic alliances can be a stepping stone from which to launch international alliances [38]. Based on this discussion, because organizations engaged in onshore IT outsourcing have learned to coordinate vendor relationships and can apply this learning to the BPO context, we hypothesize that:

**H1:** Organizations that are engaged in onshore IT outsourcing will be more likely to engage in (a) onshore BPO and (b) offshore BPO.

While organizational learning from onshore IT outsourcing helps to facilitate offshore BPO, additional learning is required to overcome differences that remain between the international and domestic business settings. To internationalize, or transfer processes and technologies from one country to
another country, an organization must develop information processing and control routines to coordinate activities across national boundaries [12]. Organizational learning plays an important role in the success of internationalization efforts [29]. Similar to the discussion for Hypothesis 1 above, the routines for international coordination are developed through learning based on international partnering experience [63, 90]. A firm that operates in multiple national markets encounters a diversity of potential suppliers and partners that are initially unfamiliar [1]. This initial lack of familiarity triggers failures and incentives to search for reliable international partners [86]. As the firm locates and gains experience with international partners, the firm learns to overcome cultural distance and communication barriers, and improve governance of relationships [63]. The firm’s accumulated experience with international partners helps the firm recognize and bridge the cultural, geographic, institutional and economic differences that exist between countries [41]. A firm's experience in hiring local employees through international subsidiaries can also help to reduce the cultural distance to partners in those countries [63]. Experience and learning enhance the firm’s ability to explore international partnership opportunities, seek partners, coordinate and allocate activities, and resolve conflicts. The firm establishes familiarity with international environments and specialization in international partnerships, which enable the firm to develop and apply coordination routines in internationalization [63].

Once a firm learns to coordinate internationally based on its experience with international partners, the firm is able to establish future international operations more smoothly and manage those operations more efficiently, and this knowledge influences the firm’s future decisions [90]. While onshore outsourcing experience helps the firm learn cooperation and collaboration in a partnership setting, offshore outsourcing gives the firm experience with both the partnership and international dimensions necessary to establish further international operations [12]. Extending the notion of organizational learning from the alliance and operational internationalization context to the offshore BPO context, we hypothesize that:

**H2:** Organizations that are engaged in coordination of international vendors, suppliers and employees through (a) offshore IT outsourcing, (b) internationalization, and (c) offshore IT employees will be more likely to engage in offshore BPO.

### 2.2. Organizational capabilities

In the knowledge-based view of the firm, knowledge is the strategically most important resource and organizational learning is a foundation for organizational capabilities [43]. Organizational capabilities require access to, integration and transfer of organizational knowledge, and involve tasks that relate directly or indirectly to the transformation of inputs into outputs and value creation by the firm [44]. Organizational capabilities are the basis on which firms establish long-term strategies and a source of competitive advantage.

Researchers have placed organizational capabilities related to knowledge transfer into two categories – systems capabilities and process capabilities [23, 54, 65]. Systems capabilities involve the technology-oriented facets of knowledge transfer, including technical infrastructure and IT systems that help to bridge time and space in the exchange of knowledge between dispersed entities [14, 42]. Process capabilities involve the people- and process-oriented facets of knowledge transfer, including the routines, procedures and coordination that facilitate knowledge exchange [49, 53].

This categorization of systems vs. process capabilities is widely echoed in the literature. For example, Bresnahan, Brynjolfsson and Hitt [19] investigate the roles of IT (systems) and workplace organization (process) in generating business value. In their study of firm performance, Aral and Weill [8] distinguish between IT investments (systems) and the practices (process) that support the use of IT. Kim and Mahoney [60] discuss the combination of IT systems (systems) and management processes (process) to generate rents for the firm. Brews and Tucci [19] note that the sophistication of modern software (systems) plus standardization of business processes (process) are among the motivators for increased external partnering. Information intensity (systems) and codification (process) facilitate the global disaggregation of occupations [73]. Building on this literature, we discuss the role of systems capabilities and process capabilities to facilitate BPO.

IT systems enhance communication and coordination within the firm and between a firm and its partners [2, 55, 70]. Firms with stronger IT systems capabilities are more focused, less hierarchical and more likely to engage in external partnering with other firms [19, 20, 55]. Consistent with the transaction cost economics perspective widely used in IS research [6, 24, 50, 70], IT systems facilitate coordination across firms which may lead the firm to partner with other firms [60, 97].
The emerging literature on modularity also supports the role of IT systems capabilities in external partnering [78, 84]. The modularity perspective originated in a manufacturing context and is now being applied to a services context. In this perspective, the standardization of interfaces between systems components enables components to interact effectively without being made specific to a particular configuration [79, 83]. By specifying and standardizing the nature of an activity and terms of exchange, the standard interface reduces specificity and provides a form of embedded control [80]. Because IT systems serve as standard interfaces for business processes, they reduce monitoring and enforcement costs and allow firms to efficiently exchange with multiple partners [78, 84]. IT systems facilitate the modularity of business processes, as discussed by Sambamurthy, Bharadwaj and Grover [81: 47] “Digitization technologies have … enabled the creation of atomized and modular business processes that … can be accessed from anywhere through electronic interfaces, greatly enhancing their reach.” Process-level research calls for more work on firm-level characteristics that can facilitate process modularity [89]. Because IT systems represent a firm-level capability that facilitates intra- and inter-firm coordination by providing a standard interface and facilitating communication, monitoring and enforcement, we hypothesize that:

H3: Organizations with systems capabilities related to IT coordination applications will be more likely to engage in (a) onshore BPO and (b) offshore BPO.

While IT systems provide a standard interface to facilitate coordination, the literature on codification indicates that underlying knowledge must be recorded in a form suitable for transfer across agents in order for knowledge transfer to take place [5, 17, 85]. Codification is the compression of knowledge and experience into a structure, involving the use of codes and models to translate rules and actions into procedures, guidelines, specifications and documents [5, 17, 61]. Codification facilitates the capture, transformation, storage and retrieval of knowledge, and the transmission of knowledge across units, firms and locations [62, 85], which contributes to modifying the spatial organization and division of labor [26]. Codification contributes to outsourcing by making it possible for buyers and sellers to enter into contractual relationships, because codification provides a representation of the specific services the buyer can expect the seller to provide [17, 28]. Codification enables an improved specification of roles, goals, operating procedures and contractual obligations to facilitate the coordination of complex activities and the split of business processes across business units and firm boundaries [33, 99].

Codification is relevant in both the domestic and international contexts. Codification makes possible the globalization of local knowledge, and reduces the time to transfer knowledge internationally [26, 62]. Boisot [17: 152] concurs: “The move abroad, therefore, is likely to involve organizational functions that trade in well codified information.” Occupation-level research reinforces that codification facilitates disaggregation across geographic platforms [73]. Because the codification of business processes represents a firm-level capability that facilitates the transfer of business processes across vendor and geographic platforms, we hypothesize that:

H4: Organizations with process capabilities related to codification will be more likely to engage in (a) onshore BPO and (b) offshore BPO.

3. Research design and methodology

This study is based on data from the 2004 InformationWeek 500 survey [31]. InformationWeek is a leading and widely circulated IT publication, and previous academic studies have also used data from InformationWeek surveys [16, 75, 82]. The InformationWeek 500 survey is an annual benchmarking survey that targets top IT managers in large firms, and collects data on the IT department and operations, along with an overview of major IT initiatives. In administering the survey, InformationWeek makes efforts to ensure that respondents are in appropriate management positions with sufficient knowledge of the firm’s IT department and operations [34, 88, 92]. Two hundred and fifty-five firms that are publicly traded in the U.S. responded to this survey and provided complete responses to the variables of interest. Of the 255 firms, 122 represent Fortune 500 companies. Data from the InformationWeek survey on BPO, IT outsourcing, internationalization, IT coordination applications and process codification are used in the empirical model. We complement the InformationWeek data with revenue and industry data from Compustat and Dun & Bradstreet.

3.1. Variable definition

The following dependent variables are used in the study.
**Onshore BPO**: Binary variable that indicates whether the firm engages in onshore business process outsourcing (1=yes, 0=no).

**Offshore BPO**: Binary variable that indicates whether the firm engages in offshore business process outsourcing (1=yes, 0=no).

The following explanatory variables are used in the study.

**Onshore IT Outsourcing**: Binary variable that indicates whether the firm engages in onshore IT outsourcing (1=yes, 0=no).

**Offshore IT Outsourcing**: Binary variable that indicates whether the firm engages in offshore IT outsourcing (1=yes, 0=no).

**Internationalization**: Four item formative index [35] that indicates the extent to which the firm has internationalized its business operations. Items covered by the index include workers or subsidiaries in foreign countries, direct purchase from foreign suppliers, reliance on global distributors, and reliance on joint ventures with global suppliers. The value of this variable ranges from 0 for firms that have none of these internationalization indicators to a value of 4 for firms that have all four internationalization indicators.

**IT Employees Offshore**: Proportion of the firm’s IT employees based outside of the United States. The value of this variable ranges from 0.00 to 1.00.

**IT Coordination Applications**: Nine item formative index that indicates whether the firm has widely deployed each of nine IT coordination applications. IT coordination applications covered by the index are enterprise resource planning (ERP), supply chain planning (SCM), customer relationship management (CRM), business intelligence (BI), business process management (BPM), business performance management, mobile commerce, content management, and product lifecycle management (PLM). The value of this variable ranges from 0 for firms that have not widely deployed any IT coordination applications to 9 for firms that have widely deployed all nine IT coordination applications.

**Business Process Codification**: Two item formative index that indicates the extent to which the firm has codified business processes. Codification is indicated by whether the firm defined its business processes, and modeled business processes using CASE or related tool. The value of this variable ranges from 0 for firms that have not defined or modeled business processes to 2 for firms that have defined and modeled business processes.

The following control variables are used in the study.

**IT Network/Storage Infrastructure**: Nine item formative index that indicates whether the firm has widely deployed each of nine IT network and storage infrastructure technologies. IT network and storage infrastructure technologies covered by the index are data warehouse, networked storage, web services, Windows server, wireless fidelity (WiFi), voice over internet protocol (VoIP), content filtering/anti-spam, intrusion detection, and grid computing. The value of this variable ranges from 0 for firms that have not widely deployed any IT network and storage infrastructure technologies to 9 for firms that have deployed all nine IT network and storage infrastructure technologies.

**Firm Size**: Natural log of annual firm revenue. Firm size may influence a firm’s propensity to outsource and/or offshore.

**Industry Sector** (finance, services, trade, manufacturing, other industrial): Based on the North American Industry Classification System (NAICS) code for each firm, we created a binary (1=yes, 0=no) variable for the finance, services, trade, other industrial, and manufacturing sectors. These five sectors represent substantially all industries in the U.S., and are similar to sectors used in other IT outsourcing studies [20].

### 3.2. Empirical 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. To overcome estimation problems in the ordinary least squares approach, we conduct our analysis using a bivariate probit model [10, 45, 69]. A bivariate probit model enables us to account for two binary response variables (onshore BPO and offshore BPO) that vary jointly, and to estimate the coefficients needed to account for this joint distribution. The functional form of our empirical model can be written as:

\[
y_1^* = \beta_1 X_1 + \varepsilon_1, y_1 = 1 \text{ if } y_1^* > 0, 0 \text{ otherwise} \quad (1)
\]

\[
y_2^* = \beta_2 X_2 + \varepsilon_2, y_2 = 1 \text{ if } y_2^* > 0, 0 \text{ otherwise} \quad (2)
\]

\[
\rho = \text{Cov} (\varepsilon_1, \varepsilon_2) \quad (3)
\]

where \(y_1\) and \(y_2\) are the observable counterparts to the two latent variables \(y_1^*\) and \(y_2^*\), \(X\)'s are variables such as IT coordination applications and business process codification, \(\beta\)'s are parameters for the
supported for onshore BPO (coefficient with offshore BPO). These hypotheses are predicted a positive association of business process codification with onshore BPO, and hypothesis 4b predicted a positive association of business process moderately statistically significant. Hypothesis 4a though the relationship with offshore BPO is only financial firms were among the first to engage in large-scale offshore initiatives. The results for control variables provide added confidence for our model.

4. Discussion and conclusion

4.1. Findings

Consistent with arguments in the theory section, we find that firms engaged in onshore IT outsourcing, a more established and mature management practice than BPO, are more likely to engage in onshore and offshore BPO. These firms have learned from experience to identify, negotiate with, monitor and manage outsourcing vendors, and are able to apply this learning to engage in BPO. We also find that firms engaged in offshore IT outsourcing and internationalization are more likely to engage in offshore BPO. These firms have learned from experience with international partners to overcome cultural distance and communication barriers, and are able to apply this learning to improve governance of relationships with offshore BPO vendors.

We also studied the relationship of systems and process capabilities with onshore and offshore BPO. We find that firms with systems capabilities related to IT coordination applications are more likely to engage in onshore and offshore BPO. IT coordination applications, such as enterprise resource planning (ERP), customer relationship management (CRM) and supply chain management (SCM), enable the firm to better integrate the outcomes of BPO vendors into its core business operations. We also find that firms with process capabilities related to business process codification are more likely to engage in onshore and offshore BPO. Codification provides the firm with a better understanding of its business processes, which in turn enables the firm to identify processes as candidates for outsourcing, scope projects, select vendors, and monitor and evaluate vendor performance.

4.2. Research and managerial implications

This study makes two contributions to the emerging literature on BPO. First, we complement prior transaction-level IT outsourcing research by using theoretical perspectives from organizational learning and organizational capabilities to identify a set of firm-level characteristics that facilitate BPO. Second, we use International Business and Strategy research to more clearly differentiate between the onshore and offshore contexts, and to develop theory to explain the use of offshore BPO as compared with onshore BPO.

3.3. Results

Table 1 provides empirical results of the bivariate probit model. Hypothesis 1a predicted a positive association of onshore IT outsourcing with onshore BPO, and Hypothesis 1b predicted a positive association of onshore IT outsourcing with offshore BPO. These hypotheses are supported for onshore BPO ($\beta_{11} = 0.898$, $p < 0.000$) and offshore BPO ($\beta_{21} = 0.913$, $p < 0.001$). Hypothesis 2a predicted a positive association of offshore IT outsourcing with offshore BPO, hypotheses 2b predicted a positive association of internationalization with offshore BPO, and hypothesis 2c predicted a positive association of offshore IT employees with offshore BPO. Offshore IT outsourcing ($\beta_{22} = 0.451$, $p < 0.042$) and internationalization ($\beta_{23} = 0.217$, $p < 0.010$) are positively associated with offshore BPO, providing support for hypotheses 2a and 2b. Hypothesis 2c is not supported, perhaps because offshore IT employees and offshore BPO may be substitutes rather than complements [52].

Hypothesis 3a predicted a positive association of IT coordination applications with onshore BPO, and hypothesis 3b predicted a positive association of IT coordination applications with offshore BPO. These hypotheses are supported for onshore BPO ($\beta_{31} = 0.106$, $p < 0.026$) and offshore BPO ($\beta_{32} = 0.093$, $p < 0.088$), though the relationship with offshore BPO is only moderately statistically significant. Hypothesis 4a predicted a positive association of business process codification with onshore BPO, and hypothesis 4b predicted a positive association of business process codification with offshore BPO. These hypotheses are supported for onshore BPO ($\beta_{41} = 0.248$, $p < 0.043$) and offshore BPO ($\beta_{42} = 0.449$, $p < 0.007$).

The results showing the effect of control variables on BPO also provide useful insights. We find that large firms tend to engage in onshore BPO ($\beta_{15} = 0.236$, $p < 0.003$) and offshore BPO ($\beta_{25} = 0.189$, $p < 0.028$) 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 administrative innovations. We also find that financial firms ($\beta_{35} = 0.890$, $p < 0.007$) and services firms ($\beta_{45} = 0.763$, $p < 0.011$) are more likely to engage in offshore BPO than are manufacturing firms. This finding is consistent with the observation that large financial firms were among the first to engage in large-scale offshore initiatives. The results for control variables provide added confidence for our model.
This study also has two implications for managers. First, our findings suggest that a firm considering BPO must evaluate its IT coordination applications and business process codification. A strong IT portfolio 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, while a weak IT portfolio would indicate that the firm may need to make some internal investments prior to pursuing BPO. Firms must also evaluate their understanding of the business process to be outsourced. Second, 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. Our findings suggest that vendors should focus their marketing efforts on firms with outsourcing experience and strong IT coordination applications and business process codification, and that these firms are more likely to produce mutually beneficial BPO relationships.

4.3. Limitations and future research

This study has two primary limitations. The first limitation relates to the dichotomous onshore and offshore BPO variables used for empirical analysis. Loh and Venkatraman [68] suggest that as outsourcing relationships grow more varied and complex, a richer description becomes necessary. Also, even though senior-level executives are known to have a comprehensive view of a firm’s operations [34, 88, 92], the InformationWeek 500 survey respondents may not have recorded the offshore BPO variable correctly. Future studies can address this limitation by gathering a richer description of BPO within a firm, in terms of the number of business processes outsourced and the proportion to which each process is outsourced, and by validating a firm’s use of onshore and offshore BPO using internal and external sources.

A second limitation relates to the sample and survey instrument design by InformationWeek magazine. For the survey, InformationWeek selects firms based on the criteria of being leaders or innovators with IT, and the sample is biased toward large firms. Previous research suggests that IT leader firms may differ in their financial performance from non-leader firms [15, 82], and we note the possibility that IT leader firms may approach BPO differently than non-leader firms. Finally, while the questions and response items administered by a practitioner publication may not fully capture the theoretical constructs in the most complete manner, future research can address this limitation by designing primary questions and response items drawing on the academic literature to more fully capture the desired theoretical constructs.

To conclude, this paper empirically tests the relationship of organizational learning and organizational capabilities with onshore and offshore business process outsourcing. We find a positive association of learning from IT outsourcing experience with onshore and offshore BPO, and a positive association of learning from IT offshoring experience and internationalization with offshore BPO. We find a positive association of systems capabilities related to IT coordination applications with onshore and offshore BPO, and a positive association of process capabilities related to codification with onshore and offshore BPO. These results indicate that firms with higher levels of IT outsourcing experience, IT coordination applications and business process codification are more likely to engage in BPO. These findings are important as firms more broadly incorporate BPO into their global sourcing strategies.

Table 1. Empirical results (bivariate probit model)

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<th>Onshore BPO</th>
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<tr>
<td>IT onshore outsourcing</td>
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<tr>
<td>IT offshore outsourcing</td>
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<td>Internationalization</td>
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<td>IT employees offshore</td>
<td>$\beta_7$</td>
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<tr>
<td>Business process codification</td>
<td>$\beta_9$</td>
<td>$\beta_{10}$</td>
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<tr>
<td>Firm size</td>
<td>$\beta_{11}$</td>
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<td>IT coordination applications</td>
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<td>Financial</td>
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<td>Services</td>
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<td>Trade and logistics</td>
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<td>Other industrial</td>
<td>$\beta_{21}$</td>
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<td>Constant</td>
<td>$\beta_{23}$</td>
<td>$\beta_{24}$</td>
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| Observations | 255 |
| Wald chi-square | 80.69 |
| Prob > Chi square | 0.000 |
| Chi-square for $\rho = 0$ | 20.43 |
| Prob > Chi square | 0.000 |

p values in parentheses
significant * at 10%; ** at 5%; *** at 1% (one tailed)
5. References


