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RESEARCH ARTICLE

Flexibility as firm value driver: Evidence from offshore outsourcing

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Research Summary: This article tests real options theory predictions that uncertainty and flexibility are key value drivers for offshore outsourcing moderated by switching costs. Examining firm-specific and market data for outsourcing cases by U.S. firms, we find that the impact of market and environmental uncertainty and flexibility on outsourcing value is net positive and that it is greater for offshore than for domestic outsourcing. Outsourcing benefits are related to flexibility arising from growth options and moderated by switching costs underlying outsourcing activities, including loss of innovative capability and economic, institutional, and cross-country cultural differences.

Managerial Summary: In the popular business literature, the "footloose" nature of outsourcing strategy characterized by an outsourcing firm's flexibility, as well as the ability in finding appropriate suppliers on a global basis, has often been touted as an important means of dealing with market uncertainty. However, the academic literature has not offered direct empirical support for the inherent value of such outsourcing strategies. Our study shows that firms tend to perform better financially when they have such outsourcing flexibility under uncertain market and environmental conditions, although this relationship may be somewhat weakened by potential loss of innovative capability and cultural and other differences in dealing with foreign suppliers.

KEYWORDS

offshore outsourcing, real options, strategic flexibility, switching costs, uncertainty

1 | INTRODUCTION

Offshore outsourcing has become a prominent part of the restructuring of global firms' supply chains. Both academics and consulting firms have supported the view that outsourcing is a key driver of firm performance (e.g., Hätönen & Eriksson, 2009; Jensen, Larsen, & Pedersen, 2013; Kotabe & Mol, 2009). Offshore outsourcing in particular has received considerable attention in the media due to its role as a vehicle of international trade and its implications for employment and economic growth (e.g., Wall Street Journal, 2006b). Yet, empirical work on the value of offshore outsourcing at the firm level has been limited and inconclusive (Mukherjee, Gaur, & Datta, 2013). Surveys of U.S. executives by Gilley and Rasheed (2000) and Bryce and Useem (1998) find little or no performance enhancement from outsourcing.

In prior literature, there are opposing arguments for and against outsourcing. Those in favor of outsourcing emphasize performance improvement as a result of increased strategic focus, lower production costs from outsourcing to lower-cost suppliers, reduction of bureaucratic costs, or relational rents. Those against outsourcing highlight the weaknesses potentially arising from poor functional interface or diseconomies of scope, opportunistic partner behavior, increased transaction and coordination costs, or hampered learning benefits and innovative capability (Kotabe & Mol, 2009).

Flexibility as a driver of outsourcing has received limited attention, with the exception of a few early authors, including Quinn and Hilmer (1994) and Linder (2004). The notion of flexibility stemming from real options theory (ROT) has been examined in diverse organizational contexts that affect the boundaries of the firm: multinational networks (Kogut & Kulatilaka, 1994), international joint ventures (Reuer & Tong, 2005, 2007), foreign market entry (Chi & McGuire, 1996), and others.[1] In this article, we examine the underexplored questions of flexibility for outsourcing cases: Does flexibility emanating from offshore outsourcing enhance firm value? What is the value of flexibility as a driver in offshore outsourcing decisions by U.S. firms?

The outsourcing decision provides an important forum for testing alternative theories on the boundaries of the firm and its performance. While outsourcing may be part of broader organizational strategies affecting the boundaries of the firm (Coase, 1937; Williamson, 1979), we focus in this article on strategic make-or-buy decisions under uncertainty from the perspective of ROT, and we assess the value impact of outsourcing decisions in an international context. We build on and extend the work of Kogut and Kulatilaka (1994), Trigeorgis (1996), Leiblein (2003), and others, and we consider flexibility in the case of outsourcing viewed as a real option and examine its empirical implications. Our real options view of outsourcing focuses on the notion that outsourcing by contracting out a supply of noncore functions or inputs for a fixed but renewable time period provides flexibility, which is valuable to the firm under market uncertainty. The firm can renew or terminate the contract (and switch to domestic or other production alternatives) depending on market conditions at contract expiration. This view of flexibility providing a means of framing a strategic response to uncertainty is not a core part of extant TCE/internalization or RBV theories of outsourcing. The predicted role and impact of environmental uncertainty in general on the make-or-buy decision and firm boundaries as examined here via the outsourcing decision under ROT is different from that under prevailing management theory. Under ROT, the

[1]For work on real options in economics and finance, see Myers (1977), McDonald and Siegel (1986), Pindyck (1988), Dixit (1989), Triantis and Hodder (1990), Trigeorgis (1993, 1996), and Bernardo and Chowdhry (2002).

value of outsourcing will increase when the level of market or environmental uncertainty increases. Under TCE/internalization, an increase in relational uncertainty (particularly associated with high asset specificity) will lead to more unanticipated contingencies, asymmetric information, incomplete (here, outsourcing) contracts, and higher market failure, leading the firm to undertake activities in-house (e.g., Leiblein, 2003).

Controlling for the related benefits and costs of outsourcing, this study addresses several related questions: Does flexibility emanating from offshore outsourcing enhance firm value net of these costs? What drives firms' decisions to outsource offshore? While the net effect of offshore outsourcing is *a priori* unclear due to the presence of both related benefits and costs, the real options flexibility argument predicts that the net value impact of outsourcing should be greater in more volatile environments and that it should be more pronounced for international than for domestic outsourcing. That is, the potential value of flexibility acquisition and downside risk containment might be greater internationally than domestically. However, it is possible that firms with higher levels of innovative capability (e.g., as proxied by R&D intensity) leading to a series of follow-on growth opportunities or multiple product generations may have more to lose from outsourcing innovation-type activities.

In our empirical work, we use a sample of outsourcing cases reported in the *Wall Street Journal* from January 1, 1995 to December 31, 2016, combined with firm-specific and contextual country data. Our main empirical findings are as follows: First, we find that outsourcing is net value enhancing on average, suggesting that perceived benefits exceed associated costs. Second, the value of outsourcing is higher in more uncertain environments, in line with ROT and in contrast to TCE. Third, outsourcing value gains are positively related to a firm's flexibility, although outsourcing involves some option value loss from erosion of innovative capability. We find that, after controlling for various switching costs including innovative capability loss and asset specificity, the value enhancement from outsourcing is greater in those firms with a higher level of flexibility. We also find some evidence of a negative offshore outsourcing squared term in line with the negative curvilinear relationship found in Kotabe and Mol (2009). Finally, the value of outsourcing firm gains is larger in host countries with closer economic, institutional, and cultural distance. These results are robust considering endogeneity of offshore outsourcing decisions.

Our study makes several contributions to the outsourcing literature in international business and strategy. We provide empirical evidence on the role of uncertainty and flexibility enhancement as key drivers of offshore outsourcing. Such flexibility is particularly valuable for firms facing greater uncertainty in global markets and is, therefore, more important for international than for domestic outsourcing. The real options argument focusing on uncertainty and flexibility is distinct from cost efficiency or competition acquisition motives suggested in prior work based on transaction cost or resource-based theories. For example, the impact of uncertainty on the value of outsourcing is favorable, in line with ROT, in contrast to the predictions of TCE about increased failure of contractual market exchanges and, hence, reduced attractiveness of outsourcing, allowing disentangling among these alternative theories. Using matched firm-level operational and financial data across industries, we show that firms in more volatile environments and with higher flexibility benefit more from the enhanced contractual optionality and favorable asymmetry associated with outsourcing, particularly offshore. This suggests that outsourcing might enable high growth firms to enhance the value arising from their growth opportunities. However, this comes with the caveat of potentially losing some option value if outsourcing involves sacrificing critical innovative capability to internally develop future generations of the product. Finally, we offer corroborating evidence regarding the importance of economic, institutional, and cultural distance in helping realize the potential gains from offshore outsourcing.

The remainder of the article is structured as follows: The next section discusses different theoretical perspectives on outsourcing, followed by the hypotheses development section. The data and methodology section describes our sample and methodology, while the next section presents our empirical results. The final section discusses the article's contributions and limitations and offers concluding remarks.

2 | PERSPECTIVES ON OUTSOURCING: REAL OPTIONS THEORY VS. CONVENTIONAL THEORIES

From an ROT perspective, outsourcing can be viewed as a strategic decision to enter an interim external contract potentially involving subsequent investments subject to renewal, modification, or cancellation, having the benefit of knowing the demand realization and of gathered experience from the supplier relationship. Thus, the outsourcing decision involves a key choice between outright in-house production commitment and contractually adjusted future investment plans at a fluctuating market price or a fixed contract price. The more global (offshore) the network of sourcing suppliers, the greater the availability of lower cost or better quality suppliers and the higher the switch flexibility value compared to domestic operations (Hätönen, 2009). This level of flexibility is not available if the firm relies exclusively on in-house operations.[2] For offshore outsourcing, volatility and information asymmetry can be significantly greater than for domestic outsourcing due to additional economic, institutional, or cultural differences. The outsourcing firm has valuable flexibility to asymmetrically benefit from favorable market developments while limiting the adverse effect of unfavorable market circumstances. Such flexibility that protects the outsourcing firm from adverse market movements offers an extra insurance value to the outsourcer under uncertain market conditions. The literature on the benefits of international operations is extensive and includes benefits of internalization (e.g., Morck & Yeung, 1991), the value of a global network (e.g., Kogut, 1985), and risk diversification (e.g., Adler & Dumas, 1983).

Offsetting these benefits are costs of covering foreign exchange risk (e.g., Choi, 1989), economic, institutional, and cultural barrier costs (e.g., Hofstede, 1983; La Porta, Lopezdesilanes, Shleifer, & Vishny, 1998), and increased costs of control and monitoring (Myerson, 1982). Offshore outsourcing, thus, involves international operations for which the above benefits and costs need to be traded off at some level. Although the relation between outsourcing and firm performance is likely positive up to a certain level if the benefits of flexibility and other benefits of outsourcing exceed associate costs (e.g., see Quinn & Hilmer, 1994), the above may turn to a potentially inverse U-shaped relationship if increasingly more critical activities get outsourced or the (opportunity) costs of outsourcing rise sufficiently beyond some level. This may be the case if, for example, excessive outsourcing of certain critical skills or activities such as R&D or product design may permanently hamper the innovative capability of the organization and, hence, result in loss of option value associated with future generations of the product (e.g., see Leiblein, 2003). Bettis, Bradley, and Hamel (1992) and Kotabe and Mol (2009) concur that excessive outsourcing may reduce the firm's ability to innovate. Similarly, a U.S. firm that outsources 100% of its manufacturing of a product may lose the skills needed to re-enter manufacturing or may run the risk of its suppliers entering downstream

[2]Moreover, as noted by Leiblein (2003), a firm's product-market diversification may affect its choice between in-house and outsourced production by altering its ability to achieve scale and scope economies. A diversified firm may generate more value investing in a process technology knowing that in case of low demand for the initial product it can switch the use of the facility to a different product market. A globally diversified firm may be able to continue utilizing a product or technology even after it loses appeal in its primary application by switching its use to another product-market application or to another geographical market.

markets on their own or even selling to competitors. As Quinn and Hilmer (1994) point out, this may not necessarily be the case, however, as there are proven partner strategies to mitigate such risks and option value loss.[3] It is, therefore, a matter of empirical testing whether firms in our sample operate on the rising part of a possible inverse U-curve (as in the negative curvilinear relationship found by Kotabe & Mol, 2009).

From the perspective of conventional management theories, outsourcing activities might alternatively be explained by transaction cost economics (TCE) (Williamson, 1975, 1979, 1981, 2008) and its internalization variant (e.g., Buckley & Casson, 1976; Teece, 1986) or by resource-based theories (RBV) (Barney, 1991a; Teece, Pisano, & Shuen, 1997). Related work argues that firms undertake outsourcing primarily to reduce costs (Smith, 2006) or to acquire core competencies (Kotabe & Murray, 2004; Mankiw & Swagel, 2006; Mukherjee et al., 2013; Prahalad & Hamel, 1990). Specifically, Mol and Brewster (2014) argue that outsourcing entails costs of search and evaluation, which are a function of transaction costs and firm capabilities. Outsourcing-related costs can arise from asset specificity (Williamson, 1979; see also Buckley & Casson, 1976; Teece, 1986), incomplete contracts (Grossman & Hart, 1986), or agency conflicts (Jensen & Meckling, 1976). There may also be loss of innovative capability (Kotabe, Mol, & Ketkar, 2008).

Traditional TCE (Coase, 1937; Williamson, 1979) posits that when it is more cost efficient for firms to perform transactions in-house than in the market place, they will be performed in-house ("make"). The Williamsonian view of TCE (Williamson, 1975, 1979, 1981) suggests that market inefficiency can be a source of transaction costs due to bounded rationality and lock-in. The internalization variant of Buckley and Casson (1976) (see also Teece, 1986) relies more on information asymmetry and property rights weakness.[4] These two variants have somewhat different implications as to whether asset specificity is at the transaction level or the level of the firm when it comes to MNEs. Two factors are particularly related to our discussion of outsourcing activities: uncertainty and asset specificity (Buckley & Casson, 1976; Leiblein, 2003; Murray & Kotabe, 1999; Williamson, 1985). Market failure and information asymmetry are more likely in situations involving both high uncertainty and asset specificity, making outsourcing less attractive.[5]

In this article, by "transaction costs" we refer mostly to internalization costs. Transaction costs are higher for knowledge assets (intangibles) in line with internalization theory (Buckley & Casson, 1976) since if these knowledge assets are known with certainty or revealed in bargaining, their values may be compromised. Thus, we rely mostly on the variant of transaction costs based on the internalization theory of Buckley and Casson (1976) (see also Teece, 1986) in arguing for the presence of higher transaction costs based on firm-level asset value. The firm-level asset specificity argument here relies more on information asymmetry and property rights weakness than on traditional TCE bounded rationality and lock-in arguments. Since the "conventional view" is the

[3]Nike Inc. is a prominent case of having successfully outsourced 100% of its shoe production to numerous suppliers globally and even its advertising (to Wieden and Kennedy) while achieving high quality products and top brand recognition through an effective partner strategy. This includes coordinating its offshore suppliers through full-time production "expatriates" sent to its suppliers' premises, product co-development and co-investing in new technologies with its "developed partners" and bringing its suppliers' top management to its headquarters to discuss future capabilities and prospects.

[4]Several other studies point out that the transaction costs associated with outsourcing arise from incomplete contracting and fragmentation of production processes (e.g., Grossman & Hart, 1986; Grossman & Helpman, 2004).

[5]On the issue of asset specificity, traditional TCE as per Williamson (1975, 1979, 1981) focuses on transaction-specific investments in assets due to bounded rationality and transaction-specific lock-in. By contrast, both RBV and ROT look at specialized assets at the firm level. Ideally, one should use transactional cost data in empirical work to capture TCE. We work with firm-level data in this article, as it focuses on the ROT perspective given a combined TCE/RBV conventional framework. We, therefore, implicitly assume that traits of the outsourcing transaction are in part reflected in the traits of the outsourcing firm. We believe this is acceptable given the ROT focus and purpose of our article, which examines the pattern of outsourcing by U.S. firms across industries for a 22-year period.

TCE-RBV combined theory in this article, this interpretation based on the internalization variant is reasonable. The combined RBV/TCE view that is commonly used in international strategy (Hitt, Hoskisson, & Kim, 1997; Madhok & Tallman, 1998) operates at a firm/transaction level that is comparable to the ROT view used herein. Empirically, this is evidenced in discussions of cooperative ventures (which includes most outsourcing), which commonly look at the value of current firm operations plus the (real) options value of flexibility (e.g., Reuer & Leiblein, 2000; Reuer & Tong, 2005, 2010).

Consequently, although from a traditional TCE perspective asset specificity in outsourcing operates at the activity level of analysis and favors more internalization than outsourcing, from an RBV and real options perspective, asset specificity and related switch use flexibility might be better viewed at the firm level of analysis. For example, general purpose assets or flexible skill sets that represent long-term organizational platforms capable of adaptation or evolution deployable in multiple domains in diverse environments (with high switch use value) represent true core competencies that should likely be kept within the firm (Prahalad & Hamel, 1990; Quinn & Hilmer, 1994). For these reasons, in our empirical tests on the impact of flexibility on the value of outsourcing, we control for asset specificity effects at the firm level.[6]

The resource-based view of the firm highlights the role of the firm's idiosyncratic inimitable resources (Barney, 1991a). Grant (1991) and Quinn and Hilmer (1994) discuss various categories of firm resources and competencies. Some types of resources or competencies ("core") are key for the firm to achieve long-term competitive advantage, while others can be better utilized by means of outside contracts (Prahalad & Hamel, 1990). RBV, consequently, suggests that a firm should invest in those skills or activities constituting core competences and outsource the rest (Gilley & Rasheed, 2000; Prahalad & Hamel, 1990; Quinn & Hilmer, 1994). From a resource perspective, outsourcing is a strategic decision or key activity for firm growth. An outsourcing firm partners with a counterparty (insourcer) who can provide noncore functions or inputs at a lower cost or who can better utilize its resources or enable it to adjust its scale. Through contracting out such noncore activities, the firm can better focus on its core business. Rooted in RBV, the core competence paradigm (Prahalad & Hamel, 1990) provides guidance as to which types of activities should be done in-house ("make") and which should be acquired in the market or outsourced (Kotabe & Murray, 2004; Mankiw & Swagel, 2006; Quinn & Hilmer, 1994).

By contrast, from an ROT perspective, the outsourcing decision involves a key choice between outright in-house production commitment and contractually adjusted future investment plans at a fluctuating market price or a fixed contract price. When the firm has a right to extend, scale up or down, or cancel the outsourcing contract under specific contingent future conditions, it acquires valuable flexibility. The outsourcing firm can then condition its future strategic investments on the successful outcome of earlier interim decisions as well as external fluctuating demand or supply conditions, or the partner relationship. With such flexible contractual outsourcing provisions, the firm can mitigate downside risk while retaining upside potential via staged, scale-adjusted decisions. Additional flexibility gains arise when the firm uses multiple suppliers for a given product or service. Boeing, for example, buys thousands of components for the 787 Dreamliner and has multiple suppliers for each component. In the case of multiple suppliers, flexibility also arises from the ability to switch among suppliers at a lower cost. When the benefits and costs of outsourcing are rather

[6]Unlike traditional TCE as per Williamson (1979, 1985) that focuses on transaction-specific investments in assets due to bounded rationality and transaction-specific lock-in, both the RBV and ROT look at specialized assets at the firm level. Here, we rely mostly on a variant of TCE based on the internalization theory of Buckley and Casson (1976) (see also Teece, 1986) in arguing for the presence of higher transaction costs based on firm-level asset value. The firm-level asset specificity argument here relies more on information asymmetry and property rights weakness than on traditional TCE bounded rationality and lock-in arguments.

predictable, outsourcing is preferred when it is a positive net present value investment. However, when the firm's investment decisions are made sequentially under uncertainty conditions, the optimal outsourcing policy may differ from the standard net present value (NPV) rule, as standard cost-benefit analysis omits the benefits of flexibility (e.g., Baldwin, 1982). ROT better captures the contingent and sequential nature of the firm's investment decisions under environmental uncertainty. It is, thus, better suited to capture the value of contractual outsourcing flexibility when a firm faces market uncertainties, such as an upsurge in input prices, a potential decline in demand due to the introduction of a superior technology or product, intense competitive rivalry in global markets, or an economic recession. Due to the sequential and contingent nature of staging investment, the firm's resources and capabilities develop through the accumulation of previous investments (e.g., Bernardo & Chowdhry, 2002; Dierickx, Cool, & Barney, 1989). By contracting certain outsourcing activities with an outside provider, the outsourcer acquires the right to choose between immediate investment commitment ("make" internally) and future extension/expansion or contraction adjustments ("buy" via an outsourcing contract). The outsourcing firm may additionally acquire more switch use flexibility, e.g., with suppliers in a multinational or in a diversified product-market context.

In effect, the outsourcing firm makes a decision between a commitment to in-house operating activities and a contingent but more flexible unaffiliated partner contractual relationship. An outsourcing contract effectively provides the flexibility to discontinue or extend and potentially expand production at specified terms or cost. Taking advantage of lower costs or the better expertise of insourcer counter parties, the outsourcing firm can achieve valuable flexibility benefits by contracting out part of its operating activities (Mukherjee et al., 2013; Quinn & Hilmer, 1994). The outsourcing contract gives the outsourcing firm the right to contingently (re)access its future investment opportunities and accordingly expand or avoid adverse market developments. This adjustment flexibility is not available to rivals who maintain all in-house operations. This value of flexibility is herein tested empirically in the context of outsourcing. To offset this, there may be a loss of option value from eroding future innovative capability; this can be viewed as another form of switching cost from outsourcing.

According to TCE, outsourcing value can arise from an insourcer's comparative cost advantage, while the RBV recognizes that additional value can accrue from the outsourcer's preferential acquisition of competitive advantages. Leiblein (2003) suggests that complementary to TCE and RBV perspectives, a real options view offers a novel approach to evaluating investment opportunities in uncertain environments, such as outsourcing. Leiblein and Miller's (2003) empirical work demonstrates that looking at a number of product markets as strategic options, firms are more likely to invest in vertical integration-enhancing economic efficiency when they serve many product markets. Increased market uncertainty when serving a number of product markets could induce an increased level of outsourcing (Alvarez & Stenbacka, 2007). Thus, ROT presents an alternative and complementary perspective by suggesting that a key source of value creation is the outsourcer's flexibility acquisition via contracting with an outside entity rather than continuing with precommitted in-house production when the latter is afflicted with high fixed costs, inflexible labor unions, or illiquid assets.

Given that outsourcing offers the firm a set of valuable real options, such as to adjust base-level production, extend it, or terminate unprofitable investment under uncertain business conditions, or to serve multiple product markets more efficiently, we show by comparing a firm's performance pre- and post-outsourcing that the value of flexibility in outsourcing decisions is net value enhancing and that it is more pronounced for more volatile environments and for offshore than for domestic outsourcing.

3 | HYPOTHESIS DEVELOPMENT

The concept of flexibility is well recognized in the business press as well as in the academic literature. An executive at Unisys Corporation, for instance, remarks that outsourcing "can offer companies the flexibility to quickly change technology as their needs change" (Wall Street Journal, 2007). Firms also use flexible contract provisions to adjust capacity or to withdraw from unfavorable market circumstances (Wall Street Journal, 2006a). Myers (1977) notes that real options, representing the ability to adapt, is critical in contingent investment decisions. Schwab and Lusztig (1972) recognize that firms use flexibility to pursue newly emergent investment opportunities in uncertain markets. Triantis and Hodder (1990) and Trigeorgis (1993) suggest that flexibility is value enhancing, as it provides a complex set of operating and strategic options. Kotabe and Mol (2009) concur that flexibility is important for firms to cope with external shocks. For a recent review of the role of real options flexibility in strategic management, see Trigeorgis and Reuer (2017).[7]

As discussed in the previous section, outsourcing affords a firm valuable flexibility to reduce exposure to unfavorable market circumstances while asymmetrically gaining from favorable developments. As for the mechanism, ROT suggests that uncertainty is the main driver of flexibility value creation. Uncertainty, however, is also not alien to transaction cost economics or resource-based theories. In TCE, internalization is a consequence of market failure exacerbated by uncertainty (Buckley & Casson, 1976; Williamson, 1979). Uncertainty raises the number of unforeseen future contingencies that may affect a market contract, increasing the potential for opportunism and the costs of writing and enforcing contingent contracts (Williamson, 1985). Resource-based theory also suggests that a firm's need for resource acquisition may be influenced by market uncertainty (Barney, 1991b). Firms make upfront investments to create new resources whose value is inherently uncertain (Lippman & Rumelt, 1982). Uncertainty exacerbates resource heterogeneity, as some firms may end up in a privileged position either out of luck or due to superior insight. These standard theories fundamentally assume that uncertainty is bad or neutral for the typical firm operating in the market. In contrast, uncertainty, which is at the core of ROT concerning investments that are often (partially) irreversible and staged, can be beneficial.

From a real options perspective, a small early-stage investment is often made to gain information about likely scenarios and to test the feasibility of (or gain access to) a scaled-up subsequent investment (Leiblein, 2003; Leiblein & Miller, 2003). In this view, a firm can acquire a right through an outsourcing contract to adjust future actions so as to gain from favorable market developments while limiting losses to a given amount via non-extension or scaling down in adverse conditions (Alvarez & Stenbacka, 2007). ROT suggests that the advantages of owning rights to an asymmetric outsourcing contract over producing in-house are greater in more uncertain market or environmental conditions. Under market or environmental uncertainty, it may be optimal to utilize market-like mechanisms (such as outsourcing in the present case) that provide greater flexibility (Leiblein, 2003). Thus, we anticipate that the impact of outsourcing on firm value is positively associated with market or environmental uncertainty, after controlling for related switching costs and other related factors.[8]

> **Hypothesis 1 (H1)** *The higher the level of market and environmental uncertainty, the higher the value of outsourcing.*

[7]For a review of alternative management theories on organizational governance form and performance, see Leiblein (2003).

[8]As is common in real options and finance theories, by "uncertainty" we mean "measurable uncertainty" or "risk," not that of agnostic or unmeasurable uncertainty in the sense of Knight (1921).

The reader should be cautioned that the treatment of uncertainty implied by real options, the RBV, and TCE is not exactly the same in terms of the types of uncertainty they address (Folta, 1998; Rindfleisch & Heide, 1997; Trigeorgis & Reuer, 2017; Vassolo, Anand, & Folta, 2004). Williamsonian TCE focuses on relational uncertainty: the more likely/costly an opportunistic market transaction partner, the greater the incentive to internalize the transaction. ROT is focused more on business or environmental uncertainty, which makes options (e.g., maintaining multiple partners or suppliers) more valuable. This is the view underlying Kogut's (1991) notion of alliances as real options. ROT is about uncertainty resolution concerning the market environment and then exercising, extending, or closing options. In all likelihood, partner/behavioral uncertainty is higher when environmental uncertainty is higher (e.g., an unfamiliar market filled with unfamiliar prospective partners), so the two may be highly positively correlated. In both TCE and ROT, what matters is future (expected) uncertainty: in ROT, it is uncertainty over the life of the option (e.g., the outsourcing contract and/or any extension thereof); in TCE it is expected uncertainty (in volumes or technologies) going forward.[9]

ROT more broadly suggests that the value creation from outsourcing is positively related to the contractual flexibility acquired by outsourcing. Firms with high levels of contractual flexibility will have more value gains to be achieved by outsourcing, as they typically face greater uncertainties and decision asymmetries. As growth options are a key component of firm flexibility, outsourcing can increase firm value by equipping firms with more potential to exploit asymmetric outcomes and grow sequentially in favorable markets, without requiring continued investment in unfavorable circumstances. Real options work has provided supportive evidence on the relationship between firm value and asymmetric or discretionary growth opportunities. Pindyck (1988), for example, provides evidence that firm value is positively associated with future growth opportunities. Kester (1984) estimates that a firm's value of growth opportunities accounts for more than half of its market value. Chung, Li, and Yu (2005) show that firm value increases with growth options at IPO. Accordingly, we expect that flexibility in the form of growth options will have a positive impact on the value of an outsourcing firm and that the impact of outsourcing on firm performance will be greater for those firms endowed with more growth options.

> **Hypothesis 2 (H2)** *The higher the firm's flexibility, the higher the value of outsourcing.*

Offsetting the above flexibility benefits arising from growth options and switch use advantages, there are various forms of switching costs. First, option value may be lost due to long-term erosion of innovative capability when R&D or product design is outsourced and future generations of the product are sacrificed (Leiblein, 2003; Quinn & Hilmer, 1994). The damage may be more severe for offshore outsourcing of critical innovative capability if the firm has less influence over an offshore supplier than a domestic one.[10] Moreover, offshore outsourcing may be associated with other adjustment or switching costs, ranging from asset specificity (Williamson, 1979, 2008) to agency costs

[9]As standard in ROT (and other disciplines), past (recent historical) uncertainty (here prior to the outsourcing decision) is estimated and used as a reasonable proxy for expected/forward uncertainty, as the two are highly correlated (though admittedly far from perfect). This is within the norm of the ROT literature and practice (Trigeorgis & Reuer, 2017) and perhaps in much of the empirical work in business and economics.

[10]The reader should be cautioned that there is an apparent inconsistency in that outsourcing is defined as a shift from internal to external (a flow variable, not a state variable), but offshoring is defined as where the supplier is located regardless of where the activity took place previously (a state variable, not a flow variable). Of course, although the outsourcing announcement *per se* clearly involves a flow variable shift, if the outsourcing activity does not get reversed after a number of years, its cumulative effect becomes analogous to that of a state variable. And this is true whether it is domestic or offshore outsourcing.

(Grossman & Helpman, 2004; Jensen & Meckling, 1976). These include costs of declining employee morale and an increase in union activism (Garaventa & Tellefsen, 2001). These costs may be generally greater for offshore than for domestic outsourcing. Furthermore, there may be incremental costs of adjusting or adapting to a foreign economic or institutional environment or a different culture. These incremental switching costs from in-house to outsourcing overseas due to economic, institutional, and cultural distance may reduce considerably the net benefits accruing from offshore outsourcing. Accordingly, we expect a negative relationship between such switching costs and offshore outsourcing performance outcomes.

> **Hypothesis 3 (H3)** *The higher the switching costs, the lower the value of offshore outsourcing. These costs include: (a) cost of innovative capacity loss; (b) asset specificity costs related to internalization; and (c) costs of adjustment due to economic, institutional, and cultural distance.*

A question of particular importance is how offshore outsourcing fares in comparison to domestic outsourcing, given that offshore outsourcing involves higher uncertainty and flexibility due to the MNC network, as well as potentially higher loss of innovative capability and other differential switching costs besides increased complexity and coordination costs. A global setting involves more uncertainties, optionalities, and asymmetries and potentially more and better offshore suppliers, lending more value to offshore than to domestic outsourcing. Related literature indicates potentially value-enhancing advantages of multinational operations compared to domestic operations (Adler & Dumas, 1983; Morck & Yeung, 1991; Mukherjee et al., 2013). Global strategies can enhance firm value by helping a firm attain more market share, lowering costs of production, or gaining access to resources not available domestically (Tallman, 2009). Although international outsourcing is often associated with increased complexity and coordination costs, offshore outsourcing contracts generally offer more flexibility than comparable domestic ones (Kogut & Kulatilaka, 1994). For instance, price reduction potential is greater in offshore outsourcing given the more diverse and heterogeneous cost structure of suppliers globally, besides an increase in the number of available partners on a global scale. This enhances the value of contractual flexibility afforded by outsourcing. Flexibility is greater for a multinational (than a domestic) firm that can benefit more broadly from its global network, including extended global supply chain relationships with offshore suppliers with diverse complementary capabilities. Moreover, as offshore outsourcing involves international operations, it can provide better operational hedging that can reduce risk exposure (Choi & Jiang, 2009). The risk reduction benefit of operational hedging is supplemental to the growth option value increase with more market uncertainty and greater international cost disparity. We expect that these benefits will generally outweigh the incremental switching and coordination costs.

> **Hypothesis 4 (H4)** *Offshore outsourcing will offer more value than domestic outsourcing.*

A conceptual model showing the nexus of ouer hypotheses related to outsourcing is presented in Figure 1.

4 | DATA AND METHODOLOGY

Next, we describe our data sample and the construction of our variables and present descriptive univariate statistics comparing offshore and domestic outsourcing samples.

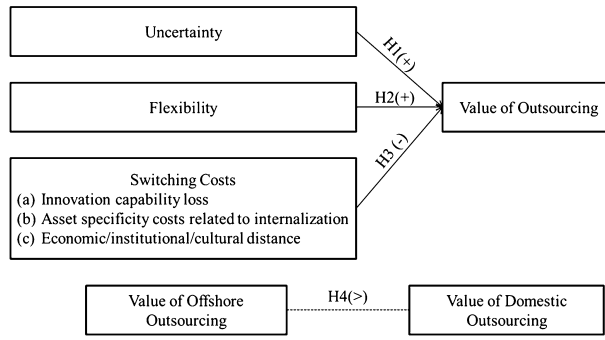

FIGURE 1 A conceptual model: The nexus of outsourcing hypotheses

4.1 | Sample description

Outsourcing announcements were obtained from *Wall Street Journal* (WSJ) articles in the *Factiva* database for the period January 1, 1995 to December 31, 2016. A keyword search was conducted using the following search terms: "outsourcing," "outsource," and "contract." Based on the search criteria, we covered outsourcing announcements for all publicly traded firms in the U.S. with 402 initial observations. The WSJ generally reports larger cases, so it is likely that many smaller cases are not well represented in this sample.[11] Subsequently, 74 observations were deleted from the initial sample, as important data—such as a specific first announcement date or outsourcer's CRSP and COMPUSTAT data—were missing in these outsourcing announcements. We further screened out other announcements (lawsuits, strikes, layoffs, mergers and acquisitions, earnings, dividends, etc.) within the outsourcing event window, 10 days before and after the announcement date. We eliminated outsourcing cases by non-U.S. firms due to our focus on outsourcing by U.S. firms in this study. Our final sample includes 273 outsourcing events by U.S. firms, of which 206 cases involved domestic outsourcing and 67 involved offshore outsourcing. This is summarized in Table 1, Panel A.

Panel B describes the sample by industry. For the total final sample of 273 outsourcing events, the highest frequencies are 70 outsourcers in the manufacturing industry and 66 in transportation and communications. The next outsourcing-important industry groups are business services (41), construction (29), and finance, insurance, and real estate (29). Of the 67 offshore outsourcers in the final sample, manufacturing (18), transportation and communications (16), and construction (11) are represented most. More than half (39) of offshore outsourcing went to Asia (not reported), with India receiving the most (16).

At the transaction level, we categorize the types of outsourcing activities as: *manufacturing service* (such as buying parts, etc.), *operational service* (such as business process, IT, distribution, etc.), *professional service* (such as accounting, finance, HR, etc.), and *other*s (no transaction-level information).[12] As shown in Panel C, the highest frequencies are 114 activities in operational service and 98 in manufacturing service for the all outsourcing sample. Of the 67 offshore outsourcing types of activity, operational service (45) and manufacturing service (15) are represented most.

[11]Potentially, there might be two types of disclosure bias. Our outsourcing sample is based on Factiva database on WSJ articles over a 22-year period. Since the WSJ generally reports outsourcing events by larger firms or those involving larger outsourcing contacts, our outsourcing announcements may potentially suffer from this bias. In addition, there could be some upward bias due to the frequency of announcements by those firms that are underperforming and use outsourcing as a way of rebooting their performance.

[12]We tried using outsourcing activities category variables in the regressions, but the results are generally insignificant.

TABLE 1 Outsourcing sample

Panel A: Sample screening			
			N
Initial sample size (1995–2016)			402
Less: Missing CRSP data, COMPUSTAT data, or event date			−74
Less: Impacted by multi-events within (−10, 10)			−8
Less: Outsourcer is a foreign firm			−47
Usable sample events (final sample)			**273**
Domestic outsourcing			206
Offshore outsourcing			67
Panel B: Frequency of outsourcers by industry			
SIC code	**Industry**	**Total**	**Offshore**
1000–1999	Mining	6	2
2000–2999	Construction	29	11
3000–3999	Manufacturing	70	18
4000–4999	Transportation and communications	66	16
5000–5999	Trade	16	5
6000–6999	Finance, insurance, and real estate	29	6
7000–7999	Business services	41	6
8000–8999	Legal, educational, and social services	16	3
Total		273	67
Panel C: Frequency of outsourcing types			
Types		**Total**	**Offshore**
Manufacturing service		98	15
Operational service		114	45
Professional service		5	0
Others		56	7
Total		273	67

4.2 | Variables used in empirical work

In this part, we describe the empirical measures used for market valuation and performance, as well as the real options variables and controls in subsequent regressions to determine their effects on firm value and performance.

4.2.1 | Value and performance

We examine longer-term post-outsourcing firm performance by Tobin's Q 1 year after outsourcing and using the average ROA in a 3-year window post-outsourcing.

4.2.2 | Market uncertainty

To proxy for environmental uncertainty facing the firm prior to outsourcing, we use the firm's *stock return volatility*, measured by the standard deviation of stock return residuals estimated by the market model for time window (−365, −10).[13] As a second measure, we also estimate *market uncertainty* as the percentage change in sales. For robustness, we also used two other measures (the standard deviation of the natural logarithm of sales in a 3-year window prior to outsourcing, and the

[13]Semi-standard deviation of stock return residuals was also used to measure downside risk, without significant difference.

standard deviation of the percentage change in sales), with qualitatively similar results. Moreover, the standard deviation of exchange rate changes is also found to be significant and positive (unreported); to the extent that exchange rate changes and a firm's output prices are correlated with each other, this could be taken as an indirect measure of market uncertainty (Choi, 1986).

4.2.3 | Flexibility

Earlier literature documented the importance of both real and financial flexibility (e.g., Mauer & Triantis, 1994). Some studies such as Mello, Parsons, and Triantis (1995) and MacKay (2003) categorized real flexibility into operational (or production) flexibility and investment (or timing) flexibility. Trigeorgis (1996) distinguishes between operational flexibility and strategic flexibility. Since major outsourcing decisions (as those reported in the WSJ) are often of potential strategic importance rather than a financial decision, we focus here on real strategic flexibility. Our measure of overall flexibility is a composite of strategic flexibility and operational flexibility (we refer to this as "flexibility"). Following related extant work (e.g., Mauer & Triantis, 1994; Reuer & Tong, 2007; Trigeorgis, 1996; Trigeorgis & Lambertides, 2014), *strategic flexibility* is proxied by pre-outsourcing industry-adjusted Tobin's Q and capital expenditure intensity, capturing firm growth. R&D intensity proxying for innovative capability is controlled separately, as it may represent an innovative option value loss (a negative sign).[14] *Operational flexibility*, which covers the extent of corporate diversification, is proxied by the number of business segments, number of geographic segments, and firm size measured by the natural log of a firm's total assets. We construct a composite *flexibility index* as a mixture of strategic flexibility and operational flexibility. Component variables are lagged 1 year prior to the outsourcing announcement. The flexibility index is computed based on the ranks of these variables for firms within the same one-digit SIC industry in the same fiscal year.[15]

4.2.4 | Switching costs

As noted, offsetting the value of flexibility arising from growth options, there may be a cost to outsourcing arising from long-term erosion of innovative capability. We measure this innovation capability loss via R&D intensity because with the outsourcing of R&D or product design, future product innovation may be adversely affected (Leiblein, 2003; Quinn & Hilmer, 1994). The benefit of cost savings in outsourcing firms should also be lower, the greater the level of assets specific to a particular production or process. By contrast, general purpose assets with multiple uses would have a higher collateral value and a lower switching cost to other activities, increasing cost savings in outsourcing. Overall, the cost savings and, hence, the value of outsourcing, is a function of asset characteristics: a high level of asset specificity implies higher switching costs associated with outsourcing. Asset specificity is measured by the ratio of intangibles to total assets. Switching costs in outsourcing may also arise due to labor resistance.

[14]Reuer and Tong (2007) find that results from a sample of manufacturing firms during 1989–2000 reveal that investments in R&D and joint venture (JV) investments contribute to firms' growth option values. This is more so for high-tech sectors. Trigeorgis and Lambertides (2014) find that R&D intensity is a key driver of growth option value. This does not lock the firm into a path, but opens up a set of future uncertain paths. However, there may be option value lost due to long-term erosion of innovative capability when R&D or product design are outsourced and future generations of the product are sacrificed (Leiblein, 2003; Quinn & Hilmer, 1994). We are treating this as a switching cost in empirical work.

[15]The composite flexibility index is constructed as follows: After obtaining measures of each variable for the two types of flexibility, we build deciles of these variables for every COMPUSTAT firm within the same two-digit SIC industry and fiscal year. Outsourcing firms are coded from 0 to 9 for each variable according to the rank of each firm in the industry. The strategic flexibility index is an average of the ranked numbers of growth flexibility variables, namely industry-adjusted Tobin's Q and capital intensity. The operational flexibility index is an average of the ranked numbers of business segment, geographical segment, and firm size. We then construct a composite flexibility index combining the two types of flexibility.

A third source of switching costs particularly relevant for offshore outsourcing is economic, institutional, and cultural distance of the foreign country. For our offshore outsourcing sample, we use three "country distance" variables as switching costs: economic distance, institutional distance, and cultural distance. *Economic distance* is the natural logarithm difference in GDP per capita between the U.S. and the host country. The data of GDP per capita is from the World Bank. *Institutional distance* is the difference in national institution between the U.S. and the host country based on the Worldwide Governance Indicators from the World Bank. *Cultural distance* is the difference in national culture between the U.S. and the host country (i.e., insourcer's country) based on Hofstede's six culture dimensional framework (2015 version).[16] Both institutional and cultural distances are computed using the method developed by Kandogan (2012), which modifies the method developed by Kogut and Singh (1988).[17]

The *offshore outsourcing* indicator is set to 1 if the event involves domestic outsourcing and 2 if offshore outsourcing; we use a (1,2) dummy rather than the standard (0,1) for offshore outsourcing because we need to use its square term to examine a nonlinear relation. With a (0,1) binary variable, the first- and second-order variables would be indistinguishable.

4.2.5 | Controls

We use two firm-specific variables as controls. These are not directly real options variables, the focus in this article. A firm's relative production cost prior to outsourcing will have an impact on the outsourcing decision and performance outcome. We use *product cost* to gauge the outsourcing firm's cost structure. Product cost is the ratio of cost of goods sold to sales. Data availability is limited for insourcer firms, which are usually small and private firms. This constrains our ability to use the relative cost between pairs of outsourcing and insourcing firms. Another firm-specific variable we control for is agency cost (Jensen & Meckling, 1976). We use the corporate governance *G-index* of Gompers, Ishii, and Metrick (2003) as a proxy for potential management entrenchment within a firm.[18] We also use *industry fixed* effects to control for other industry-specific factors.

4.3 | Univariate comparison of offshore and domestic outsourcing

Table 2 provides a univariate comparison of the mean differences in real options variables for domestic vs. offshore outsourcing samples. It is noteworthy that the composite *flexibility index*, on average, is higher for offshore than for domestic outsourcing, and the difference is statistically significant at 1% (two-tail test). Its two individual components, *strategic flexibility* and *operational flexibility,* are each greater for offshore than domestic outsourcing. These results provide preliminary univariate support for the notion that flexibility value is higher for offshore than for domestic outsourcing. We also compared offshore outsourcing with matched non-outsourcing sample. The results show that *strategic flexibility* is higher for offshore outsourcing firms than for non-outsourcing firms

[16]Data source: http://geerthofstede.com/research-and-vsm/dimension-data-matrix/

[17]Kandogan's (2012) method involves a computational improvement over Kogut and Singh (1988), not an improvement in content, as they both use the same underlying data on culture by Hofstede. We also acknowledge Shenkar's (2001, 2012) critique on commonly used cultural distance measures (illusion of symmetry, stability, linearity, causality, discordance, and so forth). We do not directly address these critiques, as they are still unsettled issues that are beyond the scope of this article. The role of cultural distance in our article is meant to capture aspects of environmental heterogeneity, along with other measures of distance, such as economic and institutional distance.

[18]The corporate governance *G-index* constructed by Gompers et al. (2003) is available from http://finance.wharton.upenn.edu/~metrick/data.htm. It measures the degree of restrictions in shareholder rights: the lower the G-index, the stronger the shareholder rights.

TABLE 2 Real options variables for offshore vs. domestic outsourcing

Panel A: Univariate analysis

	Offshore outsourcing (1)	Domestic outsourcing (2)	Mean difference test (1)–(2)	*p*-Value
Flexibility index	5.217	4.362	0.756	(.0071)***
Strategic flexibility	5.867	5.015	0.835	(.0483)**
Operational flexibility	4.567	3.709	0.678	(.0078)***
Uncertainty				
Stock return volatility	0.015	0.030	−0.015	(.0973)**
Market uncertainty	0.276	0.179	0.097	(.0866)*
Switching costs				
Innovative capability loss	0.046	0.048	−0.002	(.5700)
Asset specificity	0.073	0.113	−0.040	(.2705)
Distance				
Economic distance	5.958	0.000	5.958	(.0000)***
Institutional distance	2.064	0.000	2.064	(.0000)***
Cultural distance	1.570	0.000	1.570	(.0000)***
Controls				
Corp. governance G-index	8.600	8.892	−0.292	(.5881)
Product cost	0.655	0.695	−0.040	(.7809)

Panel B: Pearson correlations

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
(1) Flexibility index	1											
(2) Strategic flexibility	0.6365	1										
(3) Operational flexibility	0.7059	−0.0971	1									
(4) Stock return volatility	−0.0888	0.1253	−0.2297	1								
(5) Market uncertainty	0.1976	−0.083	0.1892	−0.1482	1							
(6) Innovative capability loss	0.1060	0.3395	−0.1751	0.2647	−0.2614	1						
(7) Asset specificity	−0.0648	−0.0633	−0.0255	0.0513	−0.0352	−0.0875	1					
(8) Economic distance	−0.1029	0.0987	−0.2235	0.1497	−0.1184	0.1177	−0.0745	1				
(9) Institutional distance	−0.0842	0.0004	−0.1063	0.2070	−0.3410	0.1927	−0.1278	0.0687	1			
(10) Cultural distance	0.1788	0.1334	0.1082	−0.0307	0.1557	0.0576	−0.0390	0.0362	0.0687	1		
(11) Corp. governance G-index	−0.3265	−0.1388	−0.2938	−0.1015	−0.2874	−0.0569	0.1370	0.00007	−0.0555	0.0961	1	
(12) Product cost	0.0227	0.1508	−0.1092	0.0571	−0.2996	0.0401	−0.0635	−0.0254	−0.1257	−0.0328	−0.0182	1

Panel A presents univariate analysis of offshore vs. domestic outsourcing for the means of real options variables and tests their mean differences. *p-values* of the mean difference test are reported in parentheses. *, **, and *** denote significance at the .10, .05, and .01 levels (two-tailed test). Panel B reports the correlations of the main variables used empirical work.

(significant at 5%), while uncertainty is also higher for offshore outsourcing than for non-outsourcing firms.

The correlation table is shown in Panel B. The scores of the variance inflation factors (VIF) are low (less than 10), indicating that multicollinearity is not an issue. The correlations among the three measures of distance are rather small (the highest is 0.12), which indicate that their joint inclusion in the regressions is not problematic.

5 | EMPIRICAL RESULTS

Our empirical work proceeds as follows: First, we estimate the determinants of changes in Tobin's Q and average forward ROA 3 years post-outsourcing (our measures of longer-term post-outsourcing firm performance) as a function of real options variables in Table 3. While the firm performance measures (Tobin's Q and ROA) present the long-term structure effects arising from outsourcing, the short-term effect of outsourcing addresses whether the expected net benefit of outsourcing is recognized immediately in the capital market. We, therefore, estimate the cumulative abnormal returns (CAR) upon the outsourcing announcement to see if our predictions are also in line with the market's short-term valuation response in Table 4.[19] We address the sample selection bias issue in Table 5.

5.1 | Long-term firm performance

We first test the above predictions of ROT on industry-adjusted Tobin's Q as a measure of long-term firm performance. We compute changes in industry-adjusted Tobin's Q over a 3-year period starting from 1 year before to 1 year after the year of outsourcing. Industry-adjusted Tobin's Q increases by 0.010 on average in the all outsourcing sample and by 0.031 in the offshore outsourcing subsample (not shown). This is in line with a higher impact of offshore relative to domestic outsourcing. Table 3 shows the effect of outsourcing on long-term firm performance measured by both levels and changes in industry-adjusted Tobin's Q, as well as the average forward ROA in the 3-year time window post-outsourcing. The dependent variable is outsourcer's industry-adjusted Tobin's Q 1 year following the outsourcing announcement (Q_{t+1}) or the difference in industry-adjusted Tobin's Q 1 year after outsourcing vs. 1 year before outsourcing ($\Delta Q_{t+1,\ t-1}$). *Avg ROA* is the average forward ROA in the 3-year window post-outsourcing. Real option variables include the measures of flexibility (strategic or operational), of uncertainty, and of the three forms of switching costs discussed. While pre-sourcing Q_{t-1} was included among the components of flexibility, we are using post-outsourcing performance measures here for up to 3 years forward in both changes and levels of Q as well as average forward ROA. Controls include lagged non-real option firm-specific variables. Estimations are done separately for the offshore outsourcing sample and repeated for the all-outsourcing sample with an offshore indicator variable.

We find that stock return volatility has a positive impact on Q and ROA in all eight models and is statistically significant in three. Similarly, market uncertainty measured by the percentage in sales is positive in all models but one and significant in three. Unlike the TCE prediction, which

[19]Investors rely on various internal and external corporate governance and information dissemination mechanisms—such as managerial announcements of outsourcing deals, managerial earnings guidance, analyst reports, SEC documents, activist investors, etc. —to assess the effect of corporate deals on firm value. It is not always possible to truly understand the flexibility gains from outsourcing. Recognizing this, we emphasize more the long-term performance consequences of outsourcing. Indeed, our results as to predictions of real options theory are more significant in the long-term performance measures than in the short-term market reaction.

TABLE 3 Determinants of outsourcer's long-term performance: Tobin's Q and ROA

	Offshore sample				All sample			
	(1) Q_{t+1}	(2) Q_{t+1}	(3) $\Delta Q_{t+1,\ t-1}$	(4) Avg ROA	(5) Q_{t+1}	(6) Q_{t+1}	(7) $\Delta Q_{t+1,\ t-1}$	(8) Avg ROA
Offshore outsourcing					0.0226*	0.314	0.239***	0.0106
					(1.677)	(1.596)	(2.622)	(0.462)
(Offshore outsourcing)^2					−1.561**	−0.560*	−0.465	−0.097**
					(−1.997)	(−1.698)	(−1.548)	(−2.032)
Flexibility index	0.347***		0.366**	0.042	0.372***		0.335*	0.089*
	(3.574)		(2.369)	(1.250)	(4.104)		(1.934)	(1.920)
Strategic flexibility		0.0740**				0.377***		
		(2.546)				(4.460)		
Operational flexibility		0.0272				−0.306		
		(1.610)				(−0.748)		
Uncertainty								
Stock return volatility	2.227	15.29*	18.410***	1.976	3.301	6.560	3.919**	2.279
	(1.479)	(1.717)	(2.852)	(0.294)	(0.737)	(1.205)	(2.562)	(0.336)
Market uncertainty	0.329***	0.0927*	0.118	0.004	9.155	0.0282*	0.025	−0.409
	(2.733)	(1.672)	(1.060)	(1.620)	(1.339)	(1.797)	(0.564)	(−1.608)
Switching costs								
Innovative capability loss	−5.585*	−1.384	−1.973	−0.156**	−1.956**	−1.225*	−2.185	−0.146*
	(−1.737)	(−1.393)	(−1.355)	(−2.210)	(−2.290)	(−1.762)	(−1.507)	(−1.932)
Asset specificity	−4.512**	−1.147	−1.190*	−0.008	−1.530	−1.117	−2.110	−0.095
	(−2.347)	(−1.158)	(−0.908)	(−0.886)	(−1.578)	(−0.672)	(−1.033)	(−0.099)
Distance								
Economic distance	−0.0156**	−0.050	−0.569	−0.025	−0.026	−0.032**	0.939	−0.020
	(−2.326)	(−0.683)	(−0.669)	(−0.264)	(−0.049)	(−2.174)	(1.526)	(−0.219)
Institutional distance	−0.590	−0.172*	−0.183*	−0.005	−0.119	−0.086*	−0.138***	−0.001
	(−1.309)	(−1.782)	(−1.996)	(−0.497)	(−0.679)	(−1.943)	(−2.919)	(−0.0393)
Cultural distance	−0.130**	−0.279	−0.139***	−0.024*	−0.027*	−0.143**	−0.216**	0.0176
	(−2.131)	(−1.517)	(−2.776)	(−1.884)	(−1.769)	(−2.273)	(−2.384)	(0.807)
Controls								
Corp. governance G-index	−0.687***	−0.675*	−0.585	−0.071	−0.121**	−0.398	0.186	−0.011
	(−2.861)	(−1.838)	(−0.709)	(−0.056)	(−2.159)	(−1.183)	(0.369)	(−0.078)
Product cost	1.788	1.910	0.623	−0.031	1.254	1.757**	0.748	−0.217
	(1.599)	(1.246)	(1.185)	(−0.032)	(0.829)	(2.392)	(0.834)	(−0.227)
Constant	4.172	4.565*	5.304***	5.767***	−3.661	−1.605	2.123**	5.866***
	(1.396)	(1.802)	(3.136)	(2.814)	(−1.520)	(−1.060)	(2.480)	(2.889)
Year fixed	No	No	No	No	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	64	64	64	55	268	268	268	246
Adj. R^2	0.402	0.327	0.277	0.306	0.436	0.432	0.580	0.346

The dependent variables are 1-year forward post-outsourcing industry-adjusted Tobin's Q_{t+1}, the difference of industry-adjusted Tobin's Q covering a 3-year period from t − 1 to t + 1, and the average ROA for a 3-year forward period, t + 1, t + 2, and t + 3. *t-statistics* of coefficients are reported in parentheses. All independent variables are lagged 1 year. *, **, and *** denote significance at the .10, .05, and .01 levels (two-tailed test).

TABLE 4 Determinants of outsourcer CAR

	Offshore sample, CAR (−5, 5)		All sample, CAR (−5, 5)			
	(1)	(2)	(3)	(4)	(5)	(6)
Offshore outsourcing			0.015	0.019*	0.607**	0.210
			(1.547)	(1.718)	(2.007)	(0.476)
(Offshore outsourcing)^2				−0.186***		−0.982
				(−2.825)		(−1.000)
Flexibility index	0.023**		0.024	0.002		
	(2.324)		(1.394)	(0.199)		
Strategic flexibility		0.018***			0.0226	0.150*
		(3.172)			(1.292)	(1.665)
Operational flexibility		0.016**			0.005***	0.001
		(2.269)			(2.753)	(1.134)
Uncertainty						
Stock return volatility	1.161	1.227	2.143**	1.208**	1.494***	1.556
	(1.252)	(1.243)	(2.238)	(2.227)	(3.248)	(1.222)
Market uncertainty	−0.003	0.002	0.004*	0.005	0.005	0.002
	(−0.742)	(0.863)	(1.719)	(1.190)	(1.229)	(0.244)
Switching costs						
Innovative capability loss	−1.284***	−1.685*	−1.277*	−1.226**	−0.322	−0.274
	(−3.883)	(−1.782)	(−1.797)	(−2.173)	(−1.402)	(−1.613)
Asset specificity	−0.094	−0.089	−0.016	−0.011*	−0.006	0.059
	(−0.848)	(−0.776)	(−1.006)	(−1.934)	(−1.613)	(1.551)
Distance						
Economic distance	−0.111*	−0.122*	−0.093	−0.103*	−0.104	−0.114*
	(−1.760)	(−1.913)	(−1.506)	(−1.679)	(−1.551)	(−1.676)
Institutional distance	−0.004	−0.004	−0.002	0.002	−0.002	0.003
	(−0.330)	(−0.359)	(−0.142)	(0.165)	(−0.199)	(0.222)
Cultural distance	−0.013	−0.026	−0.087	−0.074*	−0.072***	−0.084
	(−1.490)	(−1.571)	(−0.535)	(−1.871)	(−3.160)	(−1.356)
Controls						
Corp. governance G-index	−0.141	−0.178	−0.132	−0.162	−0.092	−0.085
	(−0.681)	(−0.929)	(−0.639)	(−0.880)	(−1.151)	(−1.441)
Product cost	0.108	0.159*	0.084**	0.134	0.167	0.214
	(1.465)	(1.749)	(2.358)	(1.622)	(1.580)	(1.131)
Constant	0.127	0.009	0.136	0.0187	0.250	0.141
	(0.758)	(0.074)	(0.812)	(0.158)	(1.378)	(0.925)
Year fixed	No	No	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes	Yes	Yes
Observations	67	67	273	273	273	273
Adj. R^2	0.339	0.421	0.370	0.395	0.407	0.432

The dependent variable is CAR (−5, 5) of the acquiring firms around the date of outsourcing announcement. All independent variables are lagged 1 year. *t-statistics* are reported in parentheses. *, **, and *** denote significance at the .10, .05, and .01 levels (two-tailed test).

TABLE 5 Heckman model correcting for sample selection bias

	(1) Outsourcing (first-stage)	(2) Q_{t+1}	(3) Avg ROA	(4) Car (−5,5)
Offshore outsourcing	0.013***	0.012	0.162	0.015*
	(9.164)	(1.304)	(0.679)	(1.774)
(Offshore outsourcing)^2		−0.104*	−0.098*	−0.217*
		(−1.934)	(−1.882)	(−1.851)
Flexibility index		0.242***	0.018*	0.015
		(2.959)	(1.907)	(1.482)
Uncertainty				
Stock return volatility	3.718***	4.285**	4.399**	4.354**
	(2.808)	(2.169)	(2.295)	(2.185)
Market uncertainty		1.179	0.008*	0.007
		(1.401)	(1.670)	(0.802)
Switching costs				
Innovative capability loss		−0.221***	−0.011**	0.096
		(−3.330)	(−2.293)	(1.036)
Asset specificity	0.012	0.009	−0.017	−0.009
	(0.775)	(0.819)	(−1.563)	(−0.783)
Distance				
Economic distance		−0.007*	−0.718	−0.057
		(−1.861)	(−0.941)	(−0.750)
Institutional distance		−0.011**	−0.009	0.010
		(−2.514)	(−1.476)	(0.492)
Cultural distance		−0.024**	−0.027***	−0.022**
		(−2.361)	(−2.796)	(−2.231)
Controls				
Corp. governance G-index	0.163	−0.007	−0.008	−0.007
	(1.069)	(−1.279)	(−1.339)	(−1.249)
Product cost	0.001	0.211	0.430**	−0.020
	(0.908)	(1.242)	(1.971)	(−1.118)
Inverse Mills ratio		−3.367***	−1.757*	−0.266
		(−3.604)	(−1.656)	(−1.523)
Constant	−0.014	0.425	0.449*	0.313
	(−0.562)	(1.653)	(1.754)	(1.310)
Year fixed	Yes	Yes	Yes	Yes
Industry fixed	Yes	Yes	Yes	Yes
Observations	546	528	492	538
Adj. R^2	0.120	0.411	0.350	0.297

To address sample selection bias due to the use of event data, we first estimate a Probit model for an offshore outsourcing indicator in Model (1). The resulting *inverse of the Mills ratio* is then used as an independent variable in the second stage, along with real options and other variables, to get unbiased estimates in Models (2)–(4). All explanatory variables are lagged 1 year. *t-statistics* of coefficients are reported in parentheses. *, ** and ***, denote significance at the .10, .05, and .01 levels (two-tailed test).

hypothesizes a negative effect of uncertainty, the positive effect of uncertainty on post-outsourcing performance obtained here is consistent with ROT and lends support to H1.

We also find that outsourcing flexibility, particularly strategic flexibility, is a positive driver of outsourcer value and performance, supporting H2. The flexibility index is positive in all models and statistically significant in all but one, with the strategic flexibility component being positive and significant in both Models 2 and 6. This confirms that firms with high levels of strategic flexibility tend to have high performance post-outsourcing. Economically, for offshore outsourcing firms, there is a 0.079 increase in Q_{t+1} for a one standard deviation increase in firm's strategic flexibility[20] and a 0.065 increase in Q_{t+1} for a one standard deviation increase in firm's flexibility index.

Regarding the switching costs, innovative capability loss is negative in all eight models and significant in five, consistent with the notion that there is a decline of post-outsourcing performance due to erosion of innovative capability. The coefficient of asset specificity is also negative in all models, though significant only in Models 1 and 3.[21] In terms of distance, virtually all the coefficients of all three distance variables—economic, institutional, and cultural—are negative in all models, with about half of them being statistically significant at least at 10%. These results collectively are supportive of H3 concerning the negative effect of various switching costs associated with outsourcing.

Table 3 also shows the offshore outsourcing dummy to be positive in all four models and statistically significant in two. This indicates that, due to greater optionalities and uncertainties associated with offshore outsourcing, as well as greater possibilities of operational hedging, the increase in industry-adjusted Tobin's Q post-outsourcing is higher for offshore outsourcing firms compared to domestic outsourcing firms. This provides support for H4.

Concerning the control variables, it is noteworthy that the coefficient of the corporate governance G-index (the lower the index, the higher the shareholder rights) is negative and significant in Models 1, 2, and 5. This confirms that effective corporate governance leads to higher market valuation of offshore outsourcing.

Finally, we test whether the effect of offshore outsourcing on industry-adjusted Tobin's Q or ROA might be nonlinear by adding a quadratic term of the offshore outsourcing dummy in regressions based on the all-outsourcing sample. To accommodate this, the offshore indicator is defined to be 1 if it involves domestic outsourcing and 2 if offshore outsourcing so that the corresponding squared term will have a value of 1 or 4 (rather than 0 or 1, which would make the first- and second-order effects indistinguishable). We find that the linear term for offshore outsourcing is positive in all models and significant in Models 5 and 7, while the quadratic term is negative in all models and significant in Models 5, 6, and 8. This implies a concavity in the underlying relationship in that as offshore outsourcing increases, the industry-adjusted Tobin's Q or ROA also increases, but at a decreasing rate. This relation attests to nonlinearity reminiscent of the negative curvilinear relationship found by Kotabe and Mol (2009), but stops short of confirming an inverse U-shape given the lack of a continuous offshore outsourcing variable.

5.2 | Short-term firm performance

To further examine whether our predictions regarding the benefit of outsourcing is recognized in short-term market valuations, we next examine the relationship between real options variables and the short-

[20]The standard deviation of the *strategic flexibility* for the offshore outsourcing sample is 1.066 (not shown). The coefficient on *strategic flexibility* is 0.074 in Model 2, Table 3. Therefore, with a one standard deviation change in *flexibility index*, the change in the unit of Q_{t+1} is $1.066 \times 0.074 = 0.079$.

[21]Labor resistance is another switching cost variable. However, its proxy (such as labor strike, labor union coverage, or closed vs. open shop) is not consistently available for many outsourcing firms; industry-level labor strength data were not statistically significant.

term market valuation impact upon the outsourcing announcement as measured by the cumulative abnormal return (CAR). CAR is estimated for outsourcing firms over a base window of (−5, 5) around the announcement date (day 0) for the all-outsourcing sample and for the offshore samples. The dependent variable, CAR (−5, 5), has a mean value of 0.98 and is statistically significant at a 5% level for the all-outsourcing sample. All values of CAR (−5, 5) for both the offshore outsourcing and the domestic outsourcing samples are positive and statistically significant at least at a 10% level.

Results of multivariable regressions with one-digit industry fixed effects are shown in Table 4. These results are robust with and without industry fixed effects and after controlling for a high-tech industry effect. Models 1 and 2 report the results for the offshore outsourcing sample for CAR (−5,5). Models 3–6 are similar but for the all-outsourcing sample. The results show that, consistent with ROT, stock return volatility is significantly associated with the CAR response in three out of four models. The market uncertainty variable is also positive in all four models, though significant in only one. These results lend further support to H1, confirming a positive effect of uncertainty on market valuation of outsourcing events. The positive effect of uncertainty on outsourcing value helps disentangle the theoretical prediction of real option theory from the opposite prediction of TCE.

Flexibility coefficients are positive and significant at 5% for all three flexibility measures, including the composite flexibility index and both of its components, strategic flexibility and operational flexibility. Economically, a one standard deviation increase in the *flexibility index* is associated with an expected 0.021 increase in CAR (−5, 5). The effect of flexibility is less pronounced in the "all" sample estimations compared to the offshore sample. The flexibility coefficients are all positive, and both strategic and operational flexibility are significant in one out of two cases. These results suggest that, both statistically and economically, flexibility plays a significant role in short-term market valuation post-outsourcing outcomes, similar to the long-term performance results above, confirming H2.

Similar to Tobin's Q in Table 3, we find a negative and significant innovation capability loss, supporting the notion of post-outsourcing valuation loss due to the market perception of a decline in innovative capability. In terms of other switching costs, asset specificity is negative in virtually all models, although significant only in Model 4. Economic distance is negative and significant in four out of six models. The coefficients of institutional distance are negative but not significant. The coefficient of cultural distance is negative and statistically significant in Models 4 and 5, implying that market valuation is higher if the outsourcing activity goes to a country where the cultural distance from the U.S. is smaller. Compared to Tobin's Q, these results on CAR are somewhat less significant, but still are comparable and consistent with H3.

For the all-outsourcing sample, the coefficients of the offshore outsourcing indicator are positive in all models and significant in Models 4 and 5, indicating a higher value of CAR for offshore than for domestic outsourcing, confirming the previous result on H4. The coefficient of a quadratic term for the offshore outsourcing indicator is negative in both Models 4 and 6 and significant in one model, suggesting nonlinearity in the relationship between outsourcing announcement and CAR. Again, the results on CAR in this section for short-term performance are slightly weaker, but are qualitatively the same as those reported on Tobin's Q for long-term performance.

5.3 | Correction for sample selection bias

Finally, we address sample selection bias concerns arising from relying on outsourcing event data and disregarding non-outsourcing data, using Heckman's sample selection model. For this purpose, we construct a balanced sample of outsourcing and non-outsourcing firms with propensity score matching (PSM). We perform a matching based on the following characteristics: firm size

(measured by book value of total assets), leverage, and profitability (ROA) in the same two-digit SIC industry. We obtain propensity scores using nearest-neighbor matching with replacement to assign a non-outsourcing firm. This two-step method due to Heckman combined with PSM also addresses the potential endogeneity bias arising from possible omitted variables in our basic models in the previous sections.

Following Heckman's two-stage method, we run a probit regression to estimate a binary model of a firm being in the outsourcing sample or not in the first stage (Model 1 in Table 5). In the second stage, the resulting fitted values of the outsourcing dummy from the first stage are then used as explanatory variables along with the real options variables and controls to estimate their effect on three performance cum valuation variables, Q_{t+1}, *Avg. ROA*, and *CAR (−5,5)* in Models 2, 3 and 4, respectively. The inverse Mills ratio (obtained from the first stage) is added as an additional control variable in the second-stage regression to obtain unbiased estimates.

The selection bias corrected results are broadly consistent with the earlier uncorrected results.[22] Specifically, the two uncertainty variables (especially stock return volatility) remain positive and significant. They reaffirm the importance of flexibility on industry-adjusted post-outsourcing Tobin's Q (Models 2 and 3). The significance of cultural distance is reaffirmed in all models. Other forms of switching costs, economic distance, and institutional distance as well as innovative capability loss exhibit generally significant negative impacts on firm valuation and performance, particularly in long-term performance measures.

6 | DISCUSSION AND CONCLUSIONS

Prior literature on outsourcing has focused on transaction cost economics or resource-based theory. We examine the role and value of flexibility in offshore outsourcing decisions based on ROT, controlling for other variables suggested by extant alternative theories. From a real options perspective, an outsourcing contract provides a sequential decision-making vehicle endowing firms with valuable flexibility to adjust scale or withdraw in adverse scenarios with limited cost depending on how market uncertainty gets resolved. This may be offset by loss of option value from erosion of innovation capability from outsourcing and other switching costs.

Using firm-level data for U.S. outsourcing firms, we find that the value of outsourcing is higher under more uncertain conditions, supporting the predictions of ROT against transaction cost economics. Moreover, offshore outsourcing exhibits a more pronounced value effect in long-term performance, supporting our main hypothesis that the valuation impact is greater for offshore than for domestic outsourcing. Multivariate regressions confirm that outsourcing value is positively related

[22]In the Heckman model, we did not separate the two key related issues that are intertwined in the outsourcing data we used: Why do firms outsource and why do firms announce their outsourcing decisions (assuming they have decided to outsource)? The separation of corporate data into the two components—the substance of the corporate decision and the motivation to disclose such decision—is a thorny issue set aside by most empirical work on business for the simple reason that any public corporate data used in empirical work is the result of both influences. Nevertheless, theoretical work on corporate disclosure provides some clues as to why corporations voluntarily disclose certain information. Meek, Roberts, and Gray (1995) report that firm size, country/region, listing status, and, to a lesser extent, industry are important factors in the voluntary disclosure of strategic, financial, and nonfinancial information in annual reports by firms in the U.S. and Europe. Eng and Mak (2003) examine the effect of corporate governance on voluntary disclosure. Theoretically, voluntary disclosure can be a strategic choice by the firm because while the disclosure can influence its market shares positively, it can also hurt the firm competitively if some of this information is gainfully exploited by its competitors. Methodologically, recent work on corporate fraud addresses this observability problem only partially because we do not really know corporate fraud that is not caught. In our context, we do not know corporate outsourcing that is not announced, and what we do know reflects both the outsourcing and disclosure decision aspects combined. This is a methodological issue of importance on its own, but is beyond the scope of this article.

to flexibility. In line with the real options prediction, a firm with higher flexibility has more to gain from the enhanced asymmetries, greater spreads, and choices arising from outsourcing activities, particularly in offshore and more uncertain global settings. We also find that the decision to outsource offshore involves loss in innovation capability and is affected by economic, institutional, and cultural distance acting as proxies for switching costs. These results suggest that international differences such as national governance, contract enforcement, and business friendliness complement the strategic growth options and switching flexibility arguments in influencing the outsourcing decision and performance outcomes with offshore suppliers. Overall, we confirm the extent to which the flexibility argument, as formalized by ROT, can bear on offshore outsourcing decisions and performance outcomes. Since offshore outsourcing is but one of many possible corporate decisions that may influence the boundaries of the firm in a global context, the present work has the potential to be extended to a richer set of strategic outcomes related to broader organizational settings.

Our study contributes to the existing literature related to offshore outsourcing. Although it is well recognized that flexibility is crucial for firms in uncertain markets, extant work has not tested this concept in an offshore outsourcing context. Our work fills an important gap demonstrating that flexibility adds value (net of associated costs) for both domestic and offshore outsourcing firms, and more so for the latter. Previous literature provides limited and inconclusive results on outsourcing performance outcomes. Our findings are in line with real options theory predictions that outsourcing is more value enhancing in more uncertain conditions and more so internationally than domestically. These findings can help managers and investors better assess the impact of outsourcing activities, especially those involving offshore outsourcing.

Our article is limited in several aspects, some of which might present opportunities for future research. First, our sample reliance on the WSJ is likely focused on big outsourcing deals, ignoring many smaller outsourcing decisions and activities. Executives may also be selective in terms of which deals they announce publicly, focusing mostly on those that may appear most beneficial. The Heckman correction for selection bias helps reduce related concerns. Second, we might consider a larger organizational setting in which offshore outsourcing can take place in conjunction with joint ventures or strategic alliances. Third, the costs of offshore outsourcing might be examined in a broader context. We accounted for the loss of option value that outsourcing might entail in that firms that no longer produce a given activity internally often lose the option to undertake such production later. Given that outsourcing flexibility might involve loss of future production flexibility, our empirical findings reflect the net result of this trade-off. Fourth, there is a clear need to make a stronger integration with TCE and RBV to better reflect a potentially nonlinear relationship where costs rise and net benefits decline after some point. Our inclusion of a quadratic offshore outsourcing term is a first attempt in line with a potential concave shape with declining net benefits after some point. We are not able to fully confirm an inverse U-shape relationship due to the discrete binary nature of our data and the limited set of outsourcing activities represented in our WSJ sample. Fifth, there are admittedly no universally accepted measures for flexibility, so we acknowledge the limitation in our measures in that respect. Sixth, potential effects of offshore outsourcing on employment in the home country and its impact on employee morale could be investigated further. Finally, differences in the drivers of offshore outsourcing across industries or across firms at different stages of vertical integration might also be examined in more depth.

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