

How Incomplete Contracts Foster Innovation in Inter-Organizational Relationships

REGIEN SUMO,¹ WENDY VAN DER VALK,² ARJAN VAN WEELE¹ and GEERT DUYSTERS²

¹Eindhoven University of Technology, School of Industrial Engineering, Eindhoven, The Netherlands

²Tilburg University, Tilburg School of Economics and Management, Tilburg, The Netherlands

Relative to relational governance, research into the use and effects of formal governance is scarce. Recent contributions suggest that a specific type of contract that has intentionally been left incomplete, the performance-based contract (PBC), fosters innovation. However, it is unknown how this effect occurs. To address this gap, we draw on transaction cost economics and agency theory to develop propositions on how PBCs affect innovation. PBCs are characterized by low term specificity and rewards that are tied to performance. We propose that low term specificity, that is, not stipulating how the focal firm's partner should deliver the performance and which resources to use, enhances the partner's autonomy, which in turn fosters innovation. However, excessive low term specificity inhibits innovation, since it may lead the partner to display opportunistic behavior. We furthermore propose that performance-based pay incentivizes the partner to engage in innovation. This suggests that linking rewards to performance attenuates the negative relationship between term specificity and innovation when the former is very low. Finally, we propose that a more risk-averse partner will engage in fewer innovative activities as such a partner will be less sensitive to the pay-for-performance clause.

Keywords: Inter-organizational relationship; innovation; incomplete contract; transaction cost economics; agency theory; term specificity; pay for performance; risk-averseness

Introduction

Firms often draw on both contractual and relational governance to organize their inter-organizational relationships (IORs) (Bradach, 1997; Mahapatra *et al.*, 2010), thereby taking advantage of their differential impacts (Lindkvist, 1996). At the same time, the performance implications of relational governance have been studied much more extensively compared to the impact of contractual governance (Sharma and Pillai, 2003; Vandaele *et al.*, 2007). As contracts underlie virtually any exchange relationship, it is important to understand how the design of the contract may foster or inhibit performance outcomes. Indeed, Schepker *et al.*, (2014) emphasize the need to study the relationship between contracts and relational outcomes.

This research specifically addresses how contracts affect innovation, which is critical for firms to gain and sustain competitive advantage (Brown and Eisenhardt, 1995; Keupp *et al.*, 2012; Hecker and Ganter, 2013; Hollen

et al., 2013). Since firms rely on externally developed as well as internal knowledge to improve innovation and create value (Chesbrough, 2003; Huston and Sakkab, 2006), external partners have become a critical source of innovative solutions, ideas, and technologies (Van Echtelt *et al.*, 2008; Roy *et al.*, 2004), not only for the focal firm's value proposition, but certainly also for their internal processes/ daily operations. In our research, we focus on innovation taking place within the context of a specific IOR, more precisely in the contracted activities or performance that a partner conducts for and in collaboration with a specific focal firm. Within the context of existing exchange relationships, partners may innovate as part of their daily activities to incrementally improve or more radically change the daily service delivery towards the focal firm, with the aim to more efficiently achieve performance targets such as quality and delivery time (i.e., against lower costs). Thus, innovation as such is not a contracted performance outcome, but a way to achieve contracted performance/execute contracted activities more efficiently and effectively. Both parties may benefit from the partner's innovations, for example, when innovation results in a better service offering for the focal firm as well as more efficient delivery of the transaction for the supplier. IORs generally enhance (Faems *et al.*, 2005; Goes and

Correspondence: Regien Sumo, Eindhoven University of Technology, School of Industrial Engineering, PO box 513, CNT 0.16, 5600 MB Eindhoven, The Netherlands, Tel: +31 40 247 59 51. E-mail: r.a.f.sumo@tue.nl

Park, 1997; Teece *et al.*, 1997) or even drive (Hamel, 1991; Leonard-Barton, 1995) innovation. However, innovation is unlikely to take place when dealing with opportunistic partners (Walker and Weber, 1984; Williamson, 1985; Malhotra and Lumineau, 2011), or in case the collaboration suffers from coordination failures that impede the efforts of even well intentioned parties (Gulati *et al.*, 2005; Malhotra and Lumineau, 2011).

Contracts are one possible way to mitigate these hazards (Ring and Van de Ven, 1992; Parmigiani and Mitchell, 2010; Lumineau and Malhotra, 2011), as they serve as a blueprint for exchange, aligning the actions of both parties (Macaulay, 1963; Vanneste and Puranam, 2010). Although to minimize hazards and maximize transaction gains, contracts should be as complete as possible (Williamson, 1985), contracts are inevitably incomplete since organizations are unable to foresee all future events and consider both the *ex ante* and *ex post* transaction costs (Mayer and Argyres, 2004). The problem with incomplete contracts, compared to more detailed contracts, is that they do not sufficiently address the transaction characteristics that may result in opportunistic behavior (Goldberg, 1976, 1985; Williamson, 1985). At the same time, incomplete contracts offer two important benefits over more detailed contracts. First, they are characterized by flexibility in the sense that they allow for contingency adaptability (Bernheim and Whinston, 1998; Luo, 2002), that is, the changes required to allow the focal firm's partner¹ to deal with unforeseen circumstances. Second, and more importantly, incomplete contracts allow more freedom for the partner to decide how to deliver the transaction because they are more open (Bernheim and Whinston, 1998; Luo, 2002). In other words, they are less prescribing in nature. Since the prescribing character of detailed contracts has been argued to inhibit innovation (Hart, 1989; Wang *et al.*, 2011), it is the freedom in incomplete contracts that is expected to foster innovation and that is the focus of this paper.

Performance-based contracts (PBCs) are a type of incomplete contract predominantly used in the context of partnering with an organization that delivers services that have been suggested to positively affect innovation (Gates *et al.*, 2004; Kim *et al.*, 2007; Martin, 2002; Ng *et al.*, 2009; Ng and Nudurupati, 2010). By allowing the partner to determine how to accomplish the work best, PBCs strive to increase the innovative behavior

of the partner in an IOR (Martin, 2002; Kim *et al.*, 2007; Ng *et al.*, 2009). For this reason, PBCs are increasingly applied in practice, in both the public (government, healthcare) and private (logistics, maintenance) sectors. However, the use of PBCs and their effects on relationship outcomes have been relatively under-researched (Martin, 2002; Hypko *et al.*, 2010). More specifically, though several authors have acknowledged the positive effects of PBCs on innovation, none of the research specifically studies how this effect occurs.

Thus, on the one hand, incomplete contracts are viewed as governance mechanisms that leave room for opportunistic behavior. On the other hand, incomplete contracts, or specifically PBCs, are claimed to foster innovation. We contribute to this debate by focusing on PBCs as a specific type of incomplete contract and developing a conceptual model that explains how PBCs affect innovation. We conceptualize PBCs by means of an extensive literature review, which allows us to link the characteristics of PBCs to innovation. In doing so, we hope to take a first step toward an increased understanding of how incomplete contracts affect positive relationship outcomes (i.e., innovation). The extant literature focuses primarily on the negative effects of incomplete contracts on relationship outcome (Williamson, 1985). Moreover, as noted in the review paper of Schepker *et al.* (2014), the question of how (incomplete) contracts affect positive performance outcomes, such as innovation, is insufficiently answered.

The remainder of this paper is organized as follows. We first review the literature on (incomplete) contracting and performance-based contracting to enhance our understanding of contracts in relation to innovation as a specific type of relationship outcome. For our literature study we used the search terms innovation(s), (performance-based) contract(s), and inter-organizational relationship(s) or similar terms² to search the main databases of ISI Web of Knowledge, Emerald, Science Direct and Google Scholar as to achieve high coverage of the relevant literature in the management, contracting, and innovation domains.³ We did not restrict the search to a specific timeframe as to include early efforts in studying governance, particularly in the 1970s and 1980s when the important works of for example, Williamson (1979, 1985) and Eisenhardt (1989) were published. We carefully read the abstracts to further evaluate the relevance of articles before including them in our full review, and identified additional articles from

¹An IOR can take many forms, such as joint ventures, joint production, contracted R&D, and a long-term buyer-seller relationship. In this paper, we address our research question from an intra-IOR perspective. Thus, 'focal firm' refers to an organization within the IOR (e.g., a buyer), and 'partner' refers to the partner of that focal firm (e.g., a seller). Finally, the phrase 'parties' refers to the two organizations involved in the IOR (e.g., the buyer and the seller that form the IOR).

²Innovate, innovative, contracting, outcome-based contract(s), outcome-based contracting, inter-firm relationship(s), buyer-seller/ supplier relationship(s), alliance(s), joint venture(s), collaboration(s), and governance.

³In order to maintain a fairly complete, yet manageable scope of our literature review, we have excluded contract law literature from our review.

the reference lists of the original article set. Based on the subsequent comprehensive review of the papers, we develop propositions on how the characteristics of PBCs affect innovation in IORs. For our theoretical underpinning, we specifically rely on the combination of agency theory (AT) and transaction cost economics (TCE) in relation to contractual governance. While these perspectives have extensively been used in research into the design of contracts and their effects on performance (Williamson, 1985; Saussier, 2000; Luo, 2002; Argyres *et al.*, 2007; Argyres and Mayer, 2007; Reuer and Arino, 2007),⁴ to date these two perspectives have not been considered collectively (as opposed to separately) to understand the effects of (incomplete) contracts in general, and PBCs in particular, on innovation. This is counterintuitive as both theories provide different solutions for fostering partner innovation in IORs. The paper concludes with implications and avenues for future research.

Governing inter-organizational relationships

Inter-firm governance refers to the formal and informal rules of exchange between parties in an IOR (Griffith and Myers, 2005; Vandaele *et al.*, 2007). In general, two governance strategies have been studied in IORs: formal governance strategies such as contracts, and relational governance such as trust and commitment (Griffith and Myers, 2005). Contractual governance is considered a formal, legal, and economic governance strategy which is defined as the degree to which a formal contract is established in IORs (Ferguson *et al.*, 2005; Gardet and Mothe, 2011). Whereas formal agreements may take various forms (written or verbal, implicit or explicit), contracts are written agreements that are legally binding (Klein-Woolthuis *et al.*, 2005). By providing a framework for behavior, and by prescribing the appropriate behavior of the parties in addition to each partner's role and obligations, the way the outcomes are allocated, how to act in the event of future contingencies, and the penalties for violating the contractual agreement (Poppo and Zenger, 2002; Wang *et al.*, 2011), contracts provide safeguards against *ex post* performance problems and reduce the risks resulting from opportunism on the part of either or both parties (Luo, 2002).

At the same time, contracts by themselves may be inadequate to prevent opportunism and promote

cooperation. Consequently, other mechanisms, such as relational governance, have been used to complement contracts (Macaulay, 1963). Relational governance, that is, trust and relational norms, draws on the notion that inter-organizational exchanges are often repetitious and embedded in networks of social relationships (Granovetter, 1985), which serve as a foundation for alternative forms of governance. In relational exchange, contractual enforcement occurs through social processes that build trust rather than through third-party interference (i.e., courts). Cooperation and contract discipline is achieved because of various forms of reciprocity and conditional cooperation (Axelrod, 1986; Raub and Weesie, 1990). In repeated exchange, parties develop and enforce norms of flexibility, solidarity, and information exchange (Heide and Miner, 1992; Heide, 1994; Poppo and Zenger, 2002). Relational governance can hence be interpreted as the strength of the social norms present in IORs (Ferguson *et al.*, 2005).

Ever since the importance of relationships has been emphasized in IORs, the focus has shifted towards relational governance (Sharma and Pillai, 2003; Vandaele *et al.*, 2007), which has been acknowledged to positively affect IOR performance (e.g., Saxton, 1997; Dyer and Singh, 1998; Zaheer *et al.*, 1998; Johnston *et al.*, 2004; Lavie *et al.*, 2012). For example, trust has been found to positively affect sales growth, market share, competitiveness, and goal achievements (Claro *et al.*, 2003; Ferguson *et al.*, 2005; Griffith and Myers, 2005; Paulraj *et al.*, 2008; Hoetker and Mellewigt, 2009). In contrast, relatively few studies focus on contractual governance (Vandaele *et al.*, 2007) as can be observed in Table 1. These specific studies overall suggest mixed effects of contractual governance on performance. For example, based on a survey study among 454 US wholesale-distributors, Lusch and Brown (1996) identified a positive effect of normative contracts on wholesaler-distributor performance. In a similar vein, an interview-based study on 160 service exchange dyads in the commercial banking industry in the US, Canada and Mexico by Ferguson *et al.* (2005) identified positive effects of contracts on service-exchange performance. In contrast, a survey among 396 buyer-seller relationships indicated that increasing the specificity and detail of contractual provisions in the presence of relation-specific adaptations and high transactional uncertainty negatively affects exchange partner performance (Cannon *et al.*, 2000). This fits nicely with our premise that more complete contracts are unlikely to foster innovation.

Furthermore, relational governance has been found to positively affect innovation. Multiple survey studies have demonstrated that trust has a significant positive effect on innovation (Nielsen and Nielsen, 2009; Maurer, 2010; Wang *et al.*, 2011). Another survey among 232 Argentine

⁴This paper will not discuss the basic traits of these theories. There are several well-established introductions to these theories, such as Williamson (1985) for transaction cost theory and Arrow (1985) and Eisenhardt (1989) for agency theory. Furthermore, we are aware of the limitations of these perspectives (Johnson and Medcof, 2007). We come back to this in our discussion section.

Table 1 Overview of literature on effects of contractual and relational governance on performance and innovation

| Empirical study | Research design, sample, response rate, respondent ^a | Country ^b | RG-Perf./Innov. ^c | | CG-Perf./Innov. ^c | | CG&RG-Perf./Innov. ^c | |
|-------------------------------|---|----------------------|------------------------------|--------|------------------------------|--------|---------------------------------|-------------|
| | | | Perf. | Innov. | Perf. | Innov. | Perfor. | Innov. |
| Noordewier et al., (1990) | Survey, 483, 29%, B | USA | Pos.** | | | | | |
| Mohr and Spekman (1994) | Survey, 557, 25%, B | USA | Pos.** | | | | | |
| Aulakh et al., (1996) | Survey, 652, 39, 4%, S | USA | Pos. ^d | | | | | |
| Lusch and Brown (1996) | Survey, 3225, 28, 8%, B | USA | Pos. | | Pos.* | | | |
| Paulin et al., (1997) | 122 interview, 61 dyads, Bands | Can | Pos.** | | | | | |
| Saxton (1997) | Survey, 286, 34%, AE | 8 | Pos.** | | | | | |
| Siguaw et al., (1998) | Survey, 2254, 36, 9%, Bands | USA | Pos.** | | | | | |
| Zaheer et al., (1998) | Survey, 1050, 15%, B | USA | Pos.** | | | | | |
| Cannon et al. (2000) | Survey, 2014, 23%, B | USA | Pos.** | | Neg. and Pos.** | | | Pos.** |
| Sarkar et al., (2001) | Survey, 561, 12, 3%, S | 19 | Pos.* | | | | | |
| Luo (2002) | Survey, 800, 36, 36%, JVE | China | Pos.** | | Inv.U** | | | Pos.** |
| Poppo and Zenger (2002) | Survey, 3000, 9, 5%, B | USA | | | | | | Pos.** (C) |
| Bello et al., (2003) | Survey, 402, 72%, B | USA | Pos.** | | | | | |
| Claro et al., (2003) | Survey, 598, 31%, S | Neth | Pos.** | | | | | |
| Zhang et al., (2003) | Survey, 623, 22, 6%, S | USA | Pos.** | | | | | |
| Johnston et al., (2004) | Survey, 164 dyads, Bands | Can | Pos.** | | | | | |
| Ferguson et al., (2005) | Structured interviews, 160, Bands | USA, Can, Fra | Pos.** | | Pos.** | | | |
| Griffith and Myers (2005) | Survey, 500, 20, 4%, B | USA | Pos.** | | | | | |
| Krishnan et al., (2006) | Survey, 700, 18%, AE | Ind | Post.** | | | | | |
| Lee and Cavusgil (2006) | Survey, 294, 66, 7%, AE | USA | Pos.** | | Pos.* | | | Pos. |
| Gulati and Nickerson (2008) | Survey, 222 responses, 55%, B | | | | | | | Pos.** (CS) |
| Mesquita and Lazzarini (2008) | Survey, 521, 45%, B | Arg | Pos.** | Pos.** | | | | |
| Paulraj et al., (2008) | Survey, 954, 32, 2%, B | USA | Pos.** | | | | | |
| Hoetker and Mellewig (2009) | Survey, 257, 32%, Bands | Ger | Pos.** | | Pos. | | | |
| Nielsen and Nielsen (2009) | Survey, 1851, 6, 5%, AE | Den | | | Pos.** | | | |
| Maurer (2010) | Survey, 870, 25, 35%, S | Ger | | | Pos.** | | | |
| Wang et al., (2011) | Survey, 850, 71, 41%, B | China | | | Pos.** | | Inv. U** | Pos.** (S) |
| Lavie et al., (2012) | Survey, 964, 44%, S | USA | Pos.** | | | | | |
| Huang et al., (2014) | Survey, 106, 19, 38%, S | Taiwan | Pos.** | | Inv. U** | | | Pos.*(C) |

^aAE = alliance executive; B = buyer, S = supplier, JVE = joint venture executive.

^bArg = Argentina; Can = Canada; Den = Denmark; Fra = France; Ger = Germany; Neth = Netherlands; 19&8 = multiple countries.

^cRG = relational governance; CG = contractual governance; perf = performance; innov = innovation.

^dpos = hypothesized positive relationship; neg = hypothesized negative relationship; inv.U = hypothesized inverse-U relationship.

* = partly significant.

** = significant; NO star = no significant relationship; (C) = complements; (S) = substitutes; (CS) = complements and substitutes.

wood-furniture SMEs by Mesquita and Lazzarini (2008) found that relational governance positively affects product innovation. Innovation has, however, rarely been studied as a performance outcome in relation to contractual governance. We found only two studies (one of which is conceptual) that link contractual governance to innovation. As such, our focus here is on the link between formal governance (i.e. contracts) and innovation to gain more in-depth understanding of the effects of formal

governance on innovation in IORs. Note that our focus on contracts does not imply that relational governance is not important in fostering innovation in IORs or that contractual and relational governance are not interrelated. Rather, it means that given the large amount of research that has already been conducted on the performance effects of relational governance we take a different view by studying if and how contractual governance affects performance outcome.

Contracts provide safeguards against *ex post* performance problems by discouraging the partner from pursuing its individual objectives at the expense of mutual benefits (Luo, 2002). To maximize relationship gains, contracts should be as complete as possible (Williamson, 1979, 1985) and contain clauses that address all sources of opportunistic behavior. Contracts should be more complete especially in the cases when exchange characteristics specified by TCE and AT, such as transactional complexity, transaction specific investments, frequency, environmental uncertainty, measurement problems, task complexity, and behavioral uncertainty, are present in a high degree (Arrow, 1985; Eisenhardt, 1989; Williamson, 1985). Complete contracts are contingent on all events that are relevant to the fulfillment of the contract, and they represent what organizations would specify in a world in which all future events could be foreseen (Saussier, 2000).

In reality however, contracts are frequently incomplete (Al-Najjar, 1995; Hart and Moore, 1988; Kloyer and Scholderer, 2012; Mayer and Argyres, 2004). Such contracts do not specify observable obligations and actions for the parties (Bernheim and Whinston, 1998). The degree to which these obligations and actions are specified is known as 'term specificity' (Luo, 2002). Contracts are inevitably incomplete for two reasons. First, incomplete contracts relax the extreme-rationality assumption that holds for complete contracts. The parties are subject to bounded rationality; that is, they are not able to specify all the terms and clauses (i.e., obligations and actions; Tirole, 1999; Aghion and Holden, 2011). Hence, the parties may not identify some contingencies or may not acknowledge the need to specify certain dimensions of the contractual performance (Bernheim and Whinston, 1998). Furthermore, some actions are observable by only one party or cannot be written in a way that can be legally enforced by a third party (i.e., a court; Lyons, 1996). Second, organizations balance the *ex ante* costs of designing complete contracts with the *ex-post* costs of less exhaustive arrangements (Crocker and Masten, 1991). For example, in the case of high transaction complexity and/ or high environmental uncertainty, drafting complete contracts will be virtually impossible and if anything, very costly. Whereas *ex ante* costs may include the time, negotiation, and management costs involved in preparing a detailed contract, *ex post* costs include opportunistic behavior and renegotiation costs. However, even if the *ex ante* costs are low, contracts may still be incomplete. This is often intentional (Bernheim and Whinston, 1998): these contracts contain gaps that could have easily been covered, but have been left open for purposes of freedom and flexibility. It is this level of contractual incompleteness, which is also typical for PBCs, that is our focus, regardless of its specific antecedents. Incomplete contracts do not stipulate all obligations

and actions and are therefore characterized by freedom and flexibility (Crocker and Reynolds, 1993; Al-Najjar, 1995; Bernheim and Whinston, 1998; Argyres *et al.*, 2007). This freedom can favor innovation because it allows the partner to make its own decisions about the delivery of the transaction.

The PBC is such an agreement that has intentionally been left incomplete. PBCs have a low degree of term specificity and the partner's rewards are tied to the performance they have to deliver. Term specificity is the extent to which contractual clauses related to obligations and behaviors are specified in detail. Low term specificity refers to the fact that PBCs underline the focal firm's expectations (i.e., the performance goal) rather than the partner's implementation (i.e., how it is achieved) (Kim *et al.*, 2007). As such, PBCs have lower term specificity than for example behavior-based contracts, which prescribe how the partner should deliver the transaction (the process) and which resources to use (the inputs). PBCs furthermore reward the partner based on their performance: in contrast, a behavior-based contract reimburses the partner for the processes carried out and the resources used. Thus, PBCs have two key characteristics, low term specificity and the partner's rewards being linked to performance (i.e. pay-for-performance) (Else *et al.*, 1992; Martin, 2002; Lamonthe, 2004; Hypko *et al.*, 2010; Ng and Nudurupati, 2010).

These two characteristics are also found in existing studies on PBCs, which cover a variety of sectors. For example, research in logistics, supply chain management, and service management (e.g., Doerr *et al.*, 2005; Ng *et al.*, 2009; Ng and Nudurupati, 2010) defines a PBC as a contract that 'describes and communicates measurable outcomes rather than direct performance processes' (Department of Defense, 2002, p. 1). Studies in healthcare underline the importance of an additional, above-the-baseline (i.e., fixed pay) compensation based on measures of quality of care and treatment outcome (Lindkvist, 1996; Lu *et al.*, 2003; Shen, 2003).

The role of performance-based contracts in innovation

Our review of the literature did not reveal any papers that specifically focus on how PBCs affect innovation. Kim *et al.* (2007) state that PBCs promote new and improved ways of delivering the transaction, but they do not explicitly consider the underlying mechanisms. We therefore turned to the general contracting literature and found two papers that relate contractual detail to innovation (Johnson and Medcof, 2007; Wang *et al.*, 2011). We build on these two contributions to consider how the first characteristic of PBCs (low term specificity) affects innovation in IORs. Furthermore,

Johnson and Medcof (2007) discuss the effects of rewards on innovation, albeit in an intra-firm setting where the principal is the firm and the agent is a separate division of the organization. Moreover, the management compensation literature contains a significant number of papers that use AT to study the effects of rewards on relationship outcome, such as performance and innovation (Bloom and Milkovich, 1998; Makri *et al.*, 2006; Roth and O'Donnell, 1996; Stroh *et al.*, 1996). We draw on this literature to outline the effect of the second characteristic of PBCs (i.e., partner pay) on innovation in an IOR context. In doing so, we take great care to include only those papers for which the reasoning can naturally be applied to inter-firm transactions.

In line with existing research (Johnson and Medcof, 2007; Wang *et al.*, 2011), we define innovation as partner-initiated, proactive undertakings that take place within the context of a specific IOR, either in collaboration with, but in any case for, a focal organization, that result in new or improved ways of delivering transactions. The key premise of this definition of innovation is that the organizations tap into the partner's entrepreneurial ideas (Shimizu, 2012). Note that this not only includes radical innovation such as new service concepts, but also incremental innovation such as process improvements that may, for example, result in a better quality. As opposed to innovation contracts (Beneito, 2006; Gilson *et al.*, 2009), in which innovation is the sole performance outcome, the contracts in our study usually have multiple performance outcomes, like quality or cost. Innovation, which is not among these targeted outcomes, occurs as part of daily operations and may benefit both parties, in the form of higher product quality or availability for the buyer, or transaction-related cost reductions for the supplier. In the following sections we will outline our reasoning regarding the effects of the two characteristics of PBCs on innovation.

Low term specificity and innovation

Low term specificity resonates with the contractual incompleteness dimension and occurs when the contract does not specify all the verifiable obligations and actions of the parties. Drawing on TCE, Wang *et al.* (2011) refer to term specificity as contractual detail, and they argue that, to a certain point, well-specified contracts reduce the costs and risks associated with knowledge exchange and collaborative innovation. Johnson and Medcof (2007) adopt an AT perspective and argue that the specification of the outcomes to be accomplished introduces the potential for innovation.

We hence argue that contracts that are less complete foster innovation (note however, the freedom caused by a low degree of term specificity will not always result in innovation unless, as correctly argued by AT and

described in more detail below, there are incentives in place to do so). PBCs are characterized by low term specificity since the focus of these contracts is the desired performance, not the specific actions or resources to be used. The partner therefore has the freedom to work in whatever way they consider best and to determine their procedures within certain boundaries (Johnson and Medcof, 2007; Wang *et al.*, 2011).

Low term specificity allows the partner more freedom. The partner can choose which activities to engage in and the resources to use; and therefore has a higher degree of autonomy (Johnson and Medcof, 2007; Wang *et al.*, 2011). To effectively engage in innovation, the partner should not be hindered by rigid rules and obligations (Wang *et al.*, 2011). Autonomy is thus essential to the process of leveraging existing strengths and identifying new opportunities. It allows the partner to influence the delivery of the service and make changes to the transaction. The partner gains the freedom to innovate (Paolillo and Brown, 1978; Abbey and Dickson, 1983; Arad, Hanson and Schneider, 1997) and to approach problems and performance metrics in a way that makes the most of its expertise (Amabile, 1998; Liao *et al.*, 2010; Woodman *et al.*, 1993). The partner can draw on its own experience rather than conforming to the requirements of the likely less knowledgeable principal (i.e., focal firm). It may identify a promising activity that can improve performance. When an innovative activity fails, the parties can share the experience and learn from it (Dess *et al.*, 2003).

All contracts are to some extent incomplete, with varying levels of term specificity. For example, one contract might state that the partner can choose any IT technology, provided it is from an A-brand manufacturer, whereas another might omit the A-brand condition. The latter has lower term specificity than the former. According to TCE and AT however, excessively low term specificity creates the potential for the partner to act opportunistically (Eisenhardt, 1989). Even reliable partners may not be able to resist the temptation to act opportunistically when autonomy is very high (Shimizu, 2012). Opportunistic behavior may include competitive activities or the sale of the generated (innovative) knowledge to a competitor (Kloyer and Scholderer, 2012). Thus, the overall quality and value of the innovative activities is lower when the partner has high autonomy (Shimizu, 2012). Consistent with the above, Wang *et al.* (2011) note that insufficient contractual detail is not conducive for innovation.

In summary, as term specificity decreases, the transaction costs rise to the point where the gains from additional autonomy are outweighed by its negative effects. Thus, low term specificity encourages the partner to engage in innovation, but when it becomes very low, the partners might focus their innovative activities on their

individual objectives rather than mutual objectives of the IOR (Guth and MacMillan, 1986; Shimizu, 2012). Hence, we argue:

Proposition 1. There is an inverted-U-shaped relationship between low term specificity and innovation.

The moderating role of incentive schemes

AT is the principal theory guiding organizational research on the effects of compensation on relationship outcome (e.g., Roth and O'Donnell, 1996; Stroh *et al.*, 1996; Bloom and Milkovich, 1998). It is concerned with the structuring of monitoring and compensation systems in principal-agent relationships. The problem of opportunism under low term specificity is, according to AT, the principal-agent problem: goals are misaligned (Eisenhardt, 1989). As shown above, reducing this opportunism by incorporating control and coordination mechanisms and thereby suppressing autonomy is not ideal for innovation. With such mechanisms the contract will prescribe roles and obligations, determine the content of the transaction, and specify penalties for contractual violations (Poppo and Zenger, 2002; Argyres and Mayer, 2007). This results in a rigid relationship that hinders innovation (Arad, Hanson and Schneider, 1997; Wang *et al.*, 2011). These mechanisms may also control the knowledge transfer between the parties, thereby inhibiting innovation (Wang *et al.*, 2011). Thus, although TCE prescribes to implement control and coordination mechanisms to suppress opportunism, this comes at the expense of innovation. As such, other mechanisms are needed that simultaneously suppress opportunism and foster innovation, such as financial compensation systems as proposed by AT (e.g., Bloom and Milkovich, 1998; Eisenhardt, 1989; Makri *et al.*, 2006). Compensation systems are a contractual mechanism through which many goals may be pursued. Such systems provide incentives to adopt efficient behavior, promote efficient adaptation, and balance different types of hazards (Furlotti, 2007). Their goal is to induce agents to meet the objectives of their principals (Bloom and Milkovich, 1998; Eisenhardt, 1989).

According to AT, the linking of rewards to performance is an example of an incentive scheme that can align the interests of the two parties and reduce the opportunism resulting from excessively incomplete contracts (Eisenhardt, 1989; Makri *et al.*, 2006; Devers *et al.*, 2007; Shimizu, 2012). Such incentive schemes are the second characteristic of PBCs (Kim *et al.*, 2007). Through these schemes, the contract rewards the partner based on outcomes that closely relate to the partner's efforts via incentives to meet performance goals (Lyons, 1996; Argyres and Mayer, 2007). Rewards that are linked to

behavior or resources used will discourage the partner from engaging in activities that will not be rewarded such as innovation (Deckop *et al.*, 1999). In these cases, the partner limits himself to perform only those activities and behaviors specified in the contract and for which the partner will be paid. In the extreme case, any new initiative would be a breach of contract (Johnson and Medcof, 2007). On the other hand, rewards that are linked to performance, as in PBCs, induce the partner to behave in the interest of the contracting party and create incentives to engage in (new) activities that improve performance. There is an incentive to innovate because the increased net profits accrue to the partner. Therefore, the partner will invest in performance improvement via innovative activities, anticipating that the incentive payment will offset the investment cost (Heinrich and Choi, 2007). Indeed, researchers have shown that financial incentives relate to opportunity identification and innovation (Abbey and Dickson, 1983; Shepherd and DeTienne, 2005; Johnson and Medcof, 2007). Linking rewards to performance will direct the partner toward collaborative goals even when there is a possibility to behave opportunistically (Shimizu, 2012). Accordingly, we argue that paying for performance can reduce the negative effects of excessively low term specificity. Hence, we propose the following:

Proposition 2. The inverted-U-shaped relationship between low term specificity and innovation is moderated by paying the partner based on its performance: linking rewards to performance mitigates the negative effect that very low term specificity has on innovation.

According to AT, an optimal reward scheme depends on the degree of risk-averseness of the partner (Levinthal, 1988; Eisenhardt, 1989). When the partner is paid based on performance, rather than processes or activities, its liability increases (Gates *et al.*, 2004). The partner has more responsibility and bears more risk because its income stream is uncertain (Gruneberg *et al.*, 2007; Kim *et al.*, 2010; Ng and Nudurupati, 2010; Guajardo *et al.*, 2012). Financial risks may result from, for example, defects, failure to meet completion deadlines, and quality issues. Since attitudes toward risk differ among organizations, we argue that for any given level of term specificity, the level of innovation is lower for a risk-averse partner. Risk-averse partners are willing to sacrifice some of the expected return in order to minimize their risk (Singh, 1986; March and Shapira, 1987). They will therefore opt for status-maintaining decisions, by favoring proven solutions over high-risk options (Ederer and Manso, 2013). When a risk-averse partner's payment is linked to its performance, the partner may make conservative decisions and establish greater cost control at the expense of creative

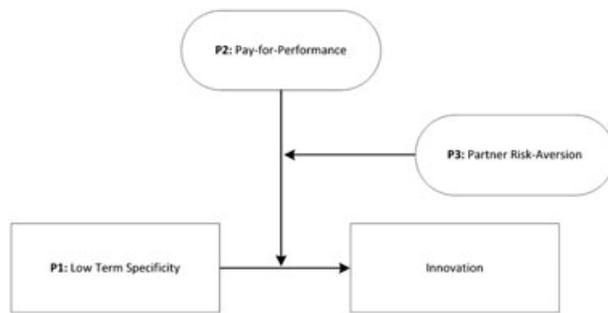


Figure 1 Conceptual model: The relationship between PBCs and innovation

freedom. This may result in fewer resources being devoted to innovative activities, since innovation is inherently risky (Bloom and Milkovich, 1998; Makri *et al.*, 2006). Eisenmann (2002) observed that agents (i.e., the partner) choose to avoid risky projects to improve the odds that they will meet performance targets. Thus, we suggest that the partner's degree of risk-averseness moderates the relationship stated in Proposition 2. All else being equal, a risk-averse partner will engage in fewer innovative activities. Accordingly, we propose the following:

Proposition 3. The more (less) risk-averse the partner, the weaker (stronger) the moderated relationship between low term specificity and innovation.

These proposed relationships, which are captured in a conceptual model (Fig. 1), shed light on the mechanisms that underlie the causal relationship between PBC and innovation. We argue that PBCs are characterized by low term specificity and rewards that are linked to performance. Low term specificity provides the partner with autonomy, which positively affects innovation. It is important to note however that the relationship between low term specificity and innovation follows an inverted U-shape: when the former is too low, its positive effect on innovation will be reduced. Furthermore, we argue that when the partner is paid based on performance, it is incentivized to behave in the interest of the focal firm and engage in innovation activities. We therefore expect that linking rewards to performance attenuates the negative relationship between term specificity and innovation when the former is very low. Finally, we postulate that, all else being equal, the more risk-averse the partner, the less it will engage in innovative activities as such, partners will be less sensitive to the pay-for-performance clause.

Conclusions and discussion

We have demonstrated how a specific type of incomplete contract, the PBC, affects a positive relational outcome, that is, innovation in the context of an IOR, through the

collective use of TCE and AT. According to our definition, PBCs are characterized by low term specificity, as they specify the performance to be attained rather than the inputs and processes to be used. Second, PBCs reward the partners for their performance (pay-for-performance). Based on TCE, we propose that the relationship between low term specificity and innovation has an inverted U-shape. Low term specificity leads to autonomy, which allows the partner the freedom to innovate. Beyond a certain point however, the freedom obtained may actually invoke opportunistic behavior. To mitigate such behavior, we propose to incentivize the partner to behave in the interest of the focal firm and to engage in (new) activities that improve performance by linking the partner's rewards to its performance, as suggested by AT. However, based on AT we also argue that incentive schemes may be less effective for risk-averse partners, as such risk-averse partners are likely to be less sensitive to the pay-for-performance clause.

Our propositions have a number of theoretical implications that build on and extend prior research on TCE and AT. Past research has tried to connect these two theories in governance research in general, and to link them to the effects of contracts on performance in particular. However, few attempts were made to combine the two theories to explain the effects of (incomplete) contracts on performance. By collectively using both theories to explain the effects of (incomplete) contracts on innovation, our study adds to the limited stream of research on the effects of formal governance on performance (Malhotra and Lumineau, 2011). First, to foster innovation, contract design should reflect innovation outcomes. Our study shows that term specificity and reward schemes seem to have an effect on innovation outcomes. The relationship between low term specificity and innovation seems to have an inverted U-shape. Hence, theory suggests that lower term specificity initially increases the partner's autonomy and thus provides the freedom to innovate. However, when term specificity is very low, the partner may act opportunistically. Based on AT, we propose that the negative effects of very low term specificity on innovation can be mitigated by incorporating financial incentive schemes. Thus, while TCE suggests that opportunistic behavior can be countered by opting for a more complete contract, AT on the other hand proposes solving the problem of opportunistic behavior by paying the partner based on its performance. These differing solutions indicate the importance of considering both theories collectively rather than separately. This also explains why PBCs may be effective in fostering innovation, as the typical characteristics of PBCs allow for the interdependent application of both solutions. For example, altering the level of term specificity affects the extent to which pay-for-performance is needed to protect the IOR

from partner opportunism. In contrast, adopting pay-for-performance allows contracts with lower term specificity.

This research also has relevant implications for practitioners who wish to foster innovation in partner relationships. First, our study seems to suggest that incomplete contracts grant the partner the autonomy necessary to engage in innovation. Consequently, managers had better avoid prescribing activities and resources in detail, provided that this fits with the full relational context from which the contract emerges. Abandoning such practices is likely to be challenging, since detailed contractual descriptions are common and favored. Second, managers should be aware that too much autonomy may result in opportunistic behavior. Our study suggests that they may mitigate this risk by considering reward schemes. However, this is unlikely to be very effective when dealing with risk-averse partners, as they are less responsive to pay-for-performance. This suggests that managers should carefully investigate the partner's risk attitude before engaging in a PBC.

While focusing on the effects of contractual characteristics has its merits, it also means that we are adopting a quite narrow view of how innovation is fostered in IORs. A broader understanding requires consideration of many other factors that could influence innovation and the effectiveness of contracts in fostering it. For example, the nature of the service may be an important determinant of process innovation, where in, for example, IT services innovation occurs more frequently than in cleaning services. More importantly, IORs in which incomplete contracts are used rely on complementary instruments of governance such as relational governance (Al-Najjar, 1995). Thus, in addition to having a sound contract, the parties should emphasize relational attributes such as trust, communication, and commitment (Mohr and Spekman, 1994; Gardet and Mothe, 2011). Communication for example, involves close interaction between individuals that might result in the sharing of knowledge, which could positively affect innovation (Im and Rai, 2008). A high degree of trust results in a closer cooperation, more open information exchange, and a higher degree of commitment between the parties (Fryxell *et al.*, 2002; Lui and Ngo, 2004), leading to the creation and sharing of knowledge that may result in innovation (Wang *et al.*, 2011). Finally, there are structural factors inherent to the IOR that might influence innovation. For example, the network which the IOR is part of might influence the outcome of the collaboration. Coleman (1990) states that network closure connects actors in such a way that obligations and sanctions may be imposed upon the network actors, without having a legal contract because there is stronger punishment from other network members (e.g., being excluded from the network) for misbehavior. Hence, if there are close network ties, the partner within the IOR

will behave appropriately by delivering the performance as agreed upon or the partner might even over perform (through e.g., innovate activities) to satisfy the focal organization and safeguard its reputation so that they will not be excluded from the network. Other structural factors to be considered in future research include firm size, transaction uncertainty, the partner's innovation capabilities, and the partner's attitude with regard to innovation.

In addition, we also did not consider antecedents to contract design. For example, past experiences (i.e., shadow of the past; Granovetter, 1985; Poppo *et al.*, 2008) are likely to impact the contract for the current exchange, at least to some extent. Accordingly, the incomplete contracts we discuss here presumably reflect the presence of a strong relationship, as the absence of such a relationship would make it easier for firms to turn to more complete contracts which would be sufficient safeguards in case of performance failures. Put differently, antecedents are likely to affect the extent to which a certain level of term specificity is possible: low term specificity will be more difficult to achieve in the absence of strong relationships. In spite of these limitations, carving out the effects of contract design (and subsequent contract use) on performance is of significant importance (Schepker *et al.*, 2014), as a large majority of contracts is considered by practitioners to be ineffective or even counter-productive (Malhotra and Lumineau, 2011). Achieving and increasing positive performance outcomes therefore warrants an enhanced understanding of effective contract design.

A third limitation is that our research focuses only on innovation as a positive performance outcome. Future research should consider other outcomes such as financial performance (e.g., profits) and relational outcomes (e.g., satisfaction about the IOR). Organizations may make explicit contractual trade-offs that favor one positive outcome over another. A fourth limitation is related to the use of TCE and AT. Although we demonstrate how the two theories may be synergistically combined to increase our theoretical understanding of the relationship between incomplete contracts, such as PBCs and innovation, they are based on simplistic assumptions about the economic actors (e.g., actors are rational and engage in opportunistic behavior when an opportunity arises to do so). In addition, contract structure and their effects on outcomes cannot be explained by a single theory, future research into contracting would benefit from incorporating multiple, preferably different, theories rather than a single one (e.g., only TCE) to better understand the structure, role and effects of contracts (Schepker *et al.*, 2014). For example, social exchange theory could explain what the role of relational governance is in fostering innovation in IORs. Finally, in this paper we consider innovation to be a positive relational outcome. However, literature suggests that

innovation could also have a negative impact on one or both parties in the IOR. For example, the parties may experience knowledge loss or avoidance of and resistance to the innovation (Mariano and Casey, 2015). Future research could study in which instances innovation could be negative for either or both of the parties in the IOR.

There are several interesting avenues for future research. A first option would be to test our propositions using large-scale survey studies, as establishing the inverse U-shaped relationship between term specificity and innovation requires cross-sectional data. Moreover, such data would allow us to calculate the optimal level of term specificity in relation to innovation. Alternatively, case-based research would be suitable for untangling the complexity of the various elements that shape IORs in practice and how these IORs shift and change over time. Second, we propose that pay-for-performance mechanisms will mitigate the negative effects of excessively low term specificity on innovation, which may imply that the level of innovation remains more or less stable after the inflection point. Further research could try to reveal the precise nature of the relationship between term specificity and innovation in the presence of a pay-for-performance clause beyond the inflection point. Innovation may continue to decrease, yet more slowly than without the pay-for-performance clause. The pay-for-performance clause may even attenuate the decrease in innovation, or even turn into an (mild) increase. Future research thus needs to address the interaction effect of pay-for-performance and term specificity in more detail. Third, in this study we have assumed that all types of term specificity and types of performance-based reward schemes have similar effects on innovation. However, innovation might depend on the nature of the terms specified and the way reward schemes are linked to performance. Future research could test how the exact nature of term specificity and reward schemes affect innovation in the form of in-depth case studies and/or large-scale survey study. In addition, future research could study the effects of different pay-for-performance schemes on innovation. As previous research in intra-firm settings has shown, different schemes such as stock ownership and stock options have different effects (Sanders, 2001; Shimizu, 2012). Similarly, in an inter-firm setting one could explore the innovation effects of pay-for-performance schemes such as bonuses and innovation incentives. Furthermore, in Proposition 3 we argued that the effectiveness of pay-for-performance depends on the partner's risk-averseness. Risk-averseness may also directly moderate the relationship between term specificity and innovation, since low term specificity

increases the partner's responsibility for the design of the transaction. Axelsson and Wynstra (2002) argue that under incompleteness, the partner must be willing and able to deal with the risk that comes with increased responsibility. Finally, innovation literature differentiates between radical and incremental innovation. Future research could test whether our propositions hold for both types of innovation. One might argue that term specificity and pay-for-performance have different implications in an incremental innovation context, where the focus is on exploiting existing products/services, versus a radical innovation context, in which the focus is on exploring new products/services.

More and more organizations are moving toward the use of contracts that are intentionally left incomplete. The successful control of the inter-organizational relationship via such a contract allows an organization to capitalize on its partner's innovation capabilities. Therefore, a better understanding of how to design, implement, manage, and control such contracts is critical. Our research contributes to this understanding by studying the effect of the contractual characteristics on relationship outcomes.

Acknowledgements

The research underlying this paper was conducted with support from the NEVI Research Foundation (NEVI Research Stichting).

References

- Abbey, A. and J. W. Dickson, 1983, "R&D work climate and innovation in semiconductors". *Academy of Management Journal*, **26**: 362–368.
- Aghion, P. and R. Holden, 2011, "Incomplete contracts and the theory of the firm: What have we learned over the past 25 years?". *Journal of Economic Perspectives*, **25**: 181–197.
- Al-Najjar, N. I., 1995, "Incomplete contracts and the governance of complex contractual Relationships". *American Economic Review*, **85**: 432–436.
- Amabile, T. M., 1998, "How to kill creativity". *Harvard Business Review*, **76**: 76–88.
- Arad, S., M. A. Hanson and R. J. Schneider, 1997, "A framework for the study of relationships between organizational characteristics and organizational innovation". *Journal of Creative Behavior*, **31**: 42–58.
- Argyres, N., J. Bercovitz and K. Mayer, 2007, "Complementarity and evolution of contractual provisions: An empirical study of IT services contracts". *Organization Science*, **18**: 3–19.
- Argyres, N. and K. J. Mayer, 2007, "Contract design as a firm capability: An integration of learning and transaction cost perspectives". *Academy of Management Review*, **32**: 1060–1077.

- Arrow, K. J.**, 1985, "The economics of agency". In: Pratt J. W. and R. J. Zeckhauser (eds.), *Principals and Agents: The Structure of Business*. Boston, MA: Harvard Business School Press.
- Aulakh, P. S., M. Kotabe and A. Sahay**, 1996, "Trust and performance in cross-border marketing partnerships: a behavioral approach". *Journal of International Business Studies*, **27**: 1–16.
- Axelrod, R.**, 1986, "An evolutionary approach to norms". *The American Political Science Review*, **80**: 1095–1111.
- Axelsson, B. and F. Wynstra**, 2002, *Buying business services*. Chichester: Wiley.
- Bello, D. C., C. Chelariu and L. Zhang**, 2003, "The antecedents and performance consequences of relationalism in export distribution channels". *Journal of Business Research*, **56**: 1–16.
- Bernheim, D. B. and M. D. Whinston**, 1998, "Incomplete contracts and strategic ambiguity". *American Economic Review*, **88**: 902–932.
- Beneito, P.**, 2006, "The innovative performance of in-house and contracted R&D in terms of patents and utility models". *Research Policy*, **35**: 502–517.
- Bloom, M. and G. T. Milkovich**, 1998, "Relationship among risk, incentive pay, and organizational performance". *Academy of Management Journal*, **11**: 283–297.
- Bradach, J. L.**, 1997, "Using the plural form in the management of restaurant chains". *Administrative Science Quarterly*, **42**: 276–303.
- Brown, S. L. and K. M. Eisenhardt**, 1995, "Product development: Past research, present findings, and future directions". *Academy of Management Review*, **20**: 343–378.
- Cannon, J. P., R. S. Achrol and G. T. Gundlach**, 2000, "Contracts, norms, and plural form Governance". *Journal of the Academy of Marketing Science*, **28**: 180–194.
- Chesbrough, H.**, 2003. *Open innovation: The new imperative for creating and profiting from technology*. Boston, MA: Harvard Business School Press.
- Claro, D. P., G. Hagelaar and O. Omta**, 2003, "The determinants of relational governance and performance: How to manage business relationships?". *Industrial Marketing Management*, **32**: 703–716.
- Coleman, J.**, 1990, *Foundations of social theory*. Cambridge, MA: Harvard University Press.
- Crocker, K. J. and S. E. Masten**, 1991, "Pretia ex machina? Prices and process in long-term Contracts". *Journal of Law & Economics*, **34**: 69–99.
- Crocker, K. J. and K. Reynolds**, 1993, "The efficiency of incomplete contracts: An empirical analysis of air force engine procurement". *RAND Journal of Economics*, **24**: 126–146.
- Deckop, J. R., R. Mangel and C. C. Cirka**, 1999, "Getting more than you pay for: Organizational citizenship behavior and pay-for-performance plans". *Academy of Management Journal*, **42**: 420–428.
- Department of Defense**, 2002, *Guidebook for performance-based service acquisition in the Department of Defense*. Washington, DC: Department of Defense.
- Dess, G. G., R. D. Ireland, S. A. Zahra, S. W. Floyd, J. J. Janney and P. J. Lane**, 2003, "Emerging issues in corporate entrepreneurship". *Journal of Management*, **29**: 351–378.
- Devers, C. E., A. A. Cannella, G. P. Reilly and M. E. Yoder**, 2007, "Executive compensation: A multidisciplinary review of recent development". *Journal of Management*, **33**: 1016–107.
- Doerr, K., I. Lewis and D. R. Eaton**, 2005, "Measurement issues in performance-based Logistics". *Journal of Public Procurement*, **5**: 164–186.
- Dyer, J. H. and H. Singh**, 1998, "The relational view: Cooperative strategies and sources of interorganizational competitive advantage". *Academy of Management Review*, **23**: 660–679.
- Ederer, F. and G. Manso**, 2013, "Is pay-for-performance detrimental to innovation?". *Management Science*, **59**: 1496–1513.
- Eisenhardt, K. M.**, 1989, "Agency theory: An assessment and review". *Academy of Management Review*, **14**: 57–74.
- Eisenmann, T. R.**, 2002, "The effects of CEO equity ownership and firm diversification on risk taking". *Strategic Management Journal*, **23**: 513–534.
- Eise, J., V. Groze, H. Hornby, R. Mirr and J. Wheelock**, 1992, "Performance-based contracting: The case of residential foster care". *Child Welfare*, **71**: 513–526.
- Faems, D., B. Van Looy and K. Debackere**, 2005, "Interorganizational collaboration and innovation: Toward a portfolio approach". *Journal of Product Innovation*, **22**: 238–250.
- Ferguson, R. J., M. Paulin and J. Bergeron**, 2005, "Contractual governance, relational governance, and the performance of interfirm service exchanges: The influence of boundary-spanner closeness". *Journal of the Academy of Marketing Science*, **33**: 217–234.
- Fryxell, G. E., R. S. Dooley and M. Vryza**, 2002, "After the ink dries: The interaction of trust and control in US-based international joint ventures". *Journal of Management Studies*, **39**: 865–886.
- Furlotti, M.**, 2007, "There is more to contracts than incompleteness: A review and assessment of empirical research on inter-firm contract design". *Journal of Management and Governance*, **11**: 61–99.
- Gardet, E. and C. Mothe**, 2011, "The dynamics of coordination in innovation networks". *European Management Journal*, **8**: 213–229.
- Gates, L. B., S. W. Klein, S. H. Akabas, R. Myers, M. Schwager and J. Kaelin-Kee**, 2004, "Performance based contracting: Turning vocational policy into jobs". *Administration and Policy in Mental Health*, **31**: 219–240.
- Gilson, R. J., C. F. Sabel and R. E. Scott**, 2009, "Contracting for innovation: vertical disintegration and interfirm collaboration". *Columbia Law Review*, **109**: 431.
- Goes, J. B. and S. H. Park**, 1997, "Interorganizational links and innovation: The case of hospital services". *Academy of Management Journal*, **40**: 673–696.
- Goldberg, V. P.**, 1976, "Toward an expanded economic theory of contract". *Journal of Economic Issues*, **10**: 45–61.
- Goldberg, V. P.**, 1985, "Price adjustment in long-term contracts". *Wisconsin Law Review*, **1985**: 527–543.
- Granovetter, M.**, 1985, "Economic action and social structure: The problem of embeddedness". *American Journal of Sociology*, **91**: 481–510.
- Griffith, D. and M. Myers**, 2005, "The performance implications of strategic fit of relational norm governance strategies in global supply chain relationships". *Journal of International Business Studies*, **36**: 254–269.
- Gruneberg, S., W. Hughes and D. Ancell**, 2007, "Risk under performance-based contracting in the UK construction sector". *Construction Management and Economics*, **25**: 691–699.
- Gujardo, A. J., A. M. Cohen, S. Kim and S. Netessine**, 2012, "Impact of performance-based contracting on product reliability: An empirical analysis". *Management Science*, **58**: 961–979.

- Gulati, R., P. R. Lawrence and P. Puranam**, 2005, "Adaptation in vertical relationships: Beyond incentive conflict". *Strategic Management Journal*, **26**: 415–440.
- Gulati, R. and J. A. Nickerson**, 2008, "Interorganizational trust, governance choice, and exchange performance". *Organization Science*, **19**: 688–708.
- Guth, W. D. and I. C. MacMillan**, 1986, "Strategy implementation versus middle management self-interest". *Strategic Management Journal*, **7**: 313–327.
- Hamel, G.**, 1991, "Competition for competence and inter-partner learning within international strategic alliances". *Strategic Management Journal*, **12**: 83–103.
- Hart, O.**, 1989, "An economist's perspective on the theory of the firm". *Columbia Law Review*, **89**: 1757–1774.
- Hart, O. and J. Moore**, 1988, "Incomplete contracts and renegotiation". *Econometrica*, **56**: 755–785.
- Hecker, A. and A. Ganter**, 2013, "The influence of product market competition on technological and management innovation: Firm-level evidence from a large-scale survey". *European Management Review*, **10**: 17–33.
- Heide, J. B.**, 1994, "Interorganizational governance in marketing channels". *Journal of Marketing*, **58**: 71–85.
- Heide, J. B. and A. S. Miner**, 1992, "The shadow of the future: Effects of anticipated interaction and frequency of contact on buyer-seller cooperation". *Academy of Management Journal*, **35**: 265–291.
- Heinrich, C. J. and Y. Choi**, 2007, "Performance-based contracting in social welfare Programs". *American Review of Public Administration*, **37**: 409–435.
- Hoetker, G. and T. Mellewigt**, 2009, "Choice and performance of governance mechanisms: Matching alliance governance to asset type". *Strategic Management Journal*, **30**: 1025–1044.
- Hollen, R. M. A., F. A. J. Van den Bosch and H. W. Volberda**, 2013, "The role of management innovation in enabling technological process innovation: An inter-organizational perspective". *European Management Review*, **10**: 35–50.
- Huang, M., H. Cheng and C. Tseng**, 2014, "Reexamining the direct and interactive effects of governance mechanisms upon buyer-supplier cooperative performance". *Industrial Marketing Management*, **43**: 704–716.
- Huston, L. and N. Sakkab**, 2006, "Connect and develop: Inside Procter & Gamble's new model for innovation". *Harvard Business Review*, **84**: 58–66.
- Hypko, P., M. Tilebein and R. Gleich**, 2010, "Clarifying the concept of performance-based contracting in manufacturing industries". *Journal of Service Management*, **21**: 625–655.
- Im, G. and A. Rai**, 2008, "Knowledge sharing ambidexterity in long-term interorganizational Relationships". *Management Science*, **54**: 1281–1296.
- Johnson, W. H. A. and J. W. Medcof**, 2007, "Motivating proactive subsidiary innovation: Agent-based theory and socialization models in global R&D". *Journal of International Management*, **13**: 472–487.
- Johnston, D. A., D. M. McCutcheon, F. I. Stuart and H. Kerwood**, 2004, "Effects of supplier trust on performance of cooperative supplier relationships". *Journal of Operations Management*, **22**: 23–38.
- Keupp, M. M., M. Palmé and O. Gassmann**, 2012, "The strategic management of innovation: A systematic review and paths for future research". *International Journal of Management Reviews*, **14**: 367–390.
- Kim, S., M. A. Cohen and S. Netessine**, 2007, "Performance contracting in after-sales service supply chains". *Management Science*, **53**: 1843–1858.
- Kim, S., A. M. Cohen, S. Netessine and S. Veeraraghavan**, 2010, "Contracting for infrequent restoration and recovery of mission-critical systems". *Management Science*, **56**: 1551–1567.
- Klein-Woolthuis, R. K., B. Hillebrand and B. Nooteboom**, 2005, "Trust, contract and relationship development". *Organization Studies*, **26**: 813–840.
- Kloyer, M. and J. Scholderer**, 2012, "Effective incomplete contracts and milestones in market-distant R&D collaboration". *Research Policy*, **41**: 346–357.
- Krishnan, R., X. Martin and N. Noorderhaven**, 2006, "When does trust matter to alliance performance?". *Academy of Management Journal*, **49**: 894–917.
- Lamonth, M.**, 2004, "Issues of contract implementation and management: The case of performance contracting in Florida human services". *International Review of Public Administration*, **8**: 59–75.
- Lavie, D., P. R. Haunschild and P. Khanna**, 2012, "Organizational differences, relational mechanisms, and alliance performance". *Strategic Management Journal*, **33**: 1453–1479.
- Lee, Y. and S. T. Cavusgil**, 2006, "Enhancing alliance performance: The effects of contractual based versus relational-based governance". *Journal of Business Research*, **59**: 896–905.
- Leonard-Barton, D.**, 1995. *Wellsprings of knowledge: Building and sustaining the sources of innovation*. Boston, MA: Harvard Business School Press.
- Levinthal, D.**, 1988, "A survey of agency models of organizations". *Journal of Economic Behavior and Organizations*, **9**: 153–185.
- Liao, H., D. Liu and R. Loi**, 2010, "Looking at both sides of the social exchange coin: A social cognitive perspective on the joint effects of relationship quality and differentiation on creativity". *Academy of Management Journal*, **53**: 1090–1109.
- Lindkvist, L.**, 1996, "Performance based compensation in health care – a Swedish experience". *Inquiry– Excellus Health Plan*, **43**: 34–53.
- Lu, M., C. A. Ma and L. Yuan**, 2003, "Risk selection and matching in performance-based contracting". *Health Economics*, **12**: 339–354.
- Lui, S. S. and H.-Y. Ngo**, 2004, "The role of trust and contractual safeguards on cooperation in non-equity alliances". *Journal of Management*, **30**: 471–485.
- Lumineau, F. and D. Malhotra**, 2011, "Shadow of the contract: How contract structure shapes interfirm dispute resolution". *Strategic Management Journal*, **32**: 532–555.
- Luo, Y.**, 2002, "Contract, cooperation, and performance in international joint ventures". *Strategic Management Journal*, **23**: 903–919.
- Lusch, R. F. and J. R. Brown**, 1996, "Interdependency, contracting, and relational behavior in marketing channels". *Journal of Marketing*, **60**: 19–38.
- Lyons, B. L.**, 1996, "Empirical relevance of efficient contract theory: Inter-firm contracts". *Oxford Review of Economic Policy*, **12**: 27–52.
- Macaulay, S.**, 1963, "Non-contractual relations in business: A preliminary study". *American Sociological Review*, **28**: 55–67.
- Mahapatra, S. K., R. Narasimhan and P. Barbierie**, 2010, "Strategic interdependence, governance effectiveness and supplier performance: A dyadic case study investigation and

- theory development". *Journal of Operations Management*, **28**: 537–552.
- Makri, M., P. J. Lane and L. R. Gomez-Mejia**, 2006, "CEO incentives, innovation, and performance in technology-intensive firms: A reconciliation of outcome and behavior-based incentive schemes". *Strategic Management Journal*, **27**: 1057–1080.
- Malhotra, D. and F. Lumineau**, 2011, "Trust and collaboration in the aftermath of conflict: The effects of contract structure". *Academy of Management Journal*, **54**: 981–998.
- March, J. G. and Z. Shapira**, 1987, "Managerial perspectives on risk and risk taking". *Management Science*, **33**: 1404–1418.
- Mariano, S. and A. Casey**, 2015, "Is organization innovation always a good thing?". *Management Learning*, **46**: 530–545.
- Martin, L. L.**, 2002, "Performance-based contracting for human services: Lessons learned for public procurement?". *Journal of Public Procurement*, **2**: 55–71.
- Maurer, I.**, 2010, "How to build trust in inter-organizational projects: The impact of project staffing and project rewards on the formation of trust, knowledge acquisition and product innovation". *International Journal of Project Management*, **28**: 629–637.
- Mayer, K. J. and N. Argyres**, 2004, "Learning to contract: Evidence from the personal computer industry". *Organization Science*, **15**: 394–410.
- Mesquita, L. F. and S. G. Lazzarini**, 2008, "Horizontal and vertical relationships in developing economies: Implications for SME's access to global markets". *Academy of Management Journal*, **51**: 359–380.
- Mohr, J. and R. Spekman**, 1994, "Characteristics of partnership success: Partnership attributes, communication behavior, and conflict resolution techniques". *Strategic Management Journal*, **15**: 135–152.
- Ng, I. C. L., R. Maull and N. Yip**, 2009, "Outcome-based contracts as a driver for systems thinking and service-dominant logic in service science: Evidence from the defense industry". *European Management Journal*, **27**: 377–387.
- Ng, I. C. L. and S. S. Nudurupati**, 2010, "Outcome-based service contracts in the defence industry – mitigating the challenges". *Journal of Service Management*, **21**: 656–674.
- Nielsen, B. and S. Nielsen**, 2009, "Learning and innovation in international strategic alliances: An empirical test for the role of trust and tacitness". *Journal of Management Studies*, **46**: 1031–1056.
- Noordewier, T. G., G. John and J. R. Nevin**, 1990, "Performance outcomes of purchasing arrangements in industrial buyer–vendor relationships". *Journal of Marketing*, **54**: 80–93.
- Paolillo, J. G. and W. B. Brown**, 1978, "How organizational factors affect R&D innovation". *Research Management*, **21**: 12–15.
- Parmigiani, A. and W. Mitchell**, 2010, "The hollow corporation revisited: Can governance mechanisms substitute for technical expertise in managing buyer-supplier relationships?". *European Management Review*, **7**: 46–70.
- Paulin, M., J. Perrien and R. Ferguson**, 1997, "Relational contract norms and the effectiveness of commercial banking relationships". *International Journal of Service Industry Management*, **8**: 435–452.
- Paulraj, A., A. A. Lado and I. J. Chen**, 2008, "Inter-organizational communication as a relational competency: Antecedents and performance outcomes in collaborative buyer-supplier relationships". *Journal of Operations Management*, **26**: 45–64.
- Poppo, L. and T. Zenger**, 2002, "Do formal contracts and relational governance mechanisms function as substitutes or complements?". *Strategic Management Journal*, **23**: 707–725.
- Poppo, L., K. Z. Zhou and S. Ryu**, 2008, "Alternative origins to interorganizational trust: An interdependence perspective on the shadow of the past and the shadow of the future". *Organization Science*, **19**: 39–55.
- Raub, W. and J. Weesie**, 1990, "Reputation and efficiency in social interactions: An example of network effects". *American Journal of Sociology*, **96**: 626–654.
- Reuer, J. J. and A. Arino**, 2007, "Strategic alliance contracts: Dimensions and determinants of contractual complexity". *Strategic Management Journal*, **28**: 313–330.
- Ring, P. S. and A. H. Van de Ven**, 1992, "Structuring cooperative relationships between Organizations". *Strategic Management Journal*, **13**: 483–498.
- Roth, K. and S. O'Donnell**, 1996, "Foreign subsidiary compensation strategy: An agency theory perspective". *Academy of Management Journal*, **36**: 678–703.
- Roy, S., K. Sivakumar and I. F. Wilkinson**, 2004, "Innovation generation in supply chain relationships: A conceptual model and research propositions". *Journal of the Academy of Marketing Science*, **32**: 61–79.
- Sanders, W. G.**, 2001, "Behavioral responses of CEOs to stock ownership and stock option pay". *Academy of Management Journal*, **44**: 477–492.
- Sarkar, M. B., R. Echambadi, S. T. Cavusgil and P. S. Aulakh**, 2001, "The influence of complementarity, compatibility, and relationship capital on alliance performance". *Journal of the Academy of Marketing Science*, **29**: 358–373.
- Saussier, S.**, 2000, "Transaction costs and contractual incompleteness: The case of Électricité de France". *Journal of Economic Behavior and Organization*, **42**: 189–206.
- Saxton, T.**, 1997, "The effects of partner and relationship characteristics on alliance outcomes". *Academy of Management Journal*, **40**: 443–461.
- Schepker, D. J., W. Y. Oh, A. Martynov and L. Poppo**, 2014, "The many futures of contracts moving beyond structure and safeguarding to coordination and adaptation". *Journal of Management*, **40**: 193–225.
- Sharma, A. and K. G. Pillai**, 2003, "The impact of transactional and relational strategies in business markets: An agenda for inquiry". *Industrial Marketing Management*, **32**: 623–626.
- Shen, Y.**, 2003, "Selection incentives in a performance-based contracting system". *Health Service Research*, **8**: 535–552.
- Shepherd, D. A. and D. R. DeTienne**, 2005, "Prior knowledge, financial reward, and opportunity identification". *Entrepreneurship: Theory and Practice*, **29**: 91–112.
- Shimizu, K.**, 2012, "Risks of corporate entrepreneurship: Autonomy and agency issues". *Organization Science*, **23**: 194–206.
- Siguaw, J. A., P. M. Simpson and T. L. Baker**, 1998, "Effects of supplier market orientation on distributor market orientation and the channel relationship: The distributor perspective". *Journal of Marketing*, **62**: 99–111.
- Singh, J. V.**, 1986, "Performance, slack, and risk taking in organizational decision making". *Academy of Management Journal*, **29**: 562–585.
- Stroh, L. K., J. M. Brett, J. P. Bauman and A. H. Reilly**, 1996, "Agency theory and variable compensation strategies". *Academy of Management Journal*, **39**: 751–767.
- Tece, D. J., G. Pisano and A. Shuen**, 1997, "Dynamic capabilities and strategic management". *Strategic Management Journal*, **18**: 509–533.

- Tirole, J.**, 1999, "Incomplete contracts: Where do we stand?". *Econometrica*, **67**: 741–781.
- Vandaele, D., D. Rangarajan, P. Gemmel and A. Lievens**, 2007, "How to govern business services exchanges: Contractual and relational issues". *International Journal of Management Reviews*, **9**: 237–258.
- Van Echtelt, F. E. A., F. Wynstra, A. Van Weele and G. Duysters**, 2008, "Managing supplier involvement in new product development: A multiple-case study". *Journal of Product Innovation Management*, **25**: 180–201.
- Vanneste, B. S. and P. Puranam**, 2010, "Repeated interactions and contractual detail: Identifying the learning effect". *Organization Science*, **21**: 186–201.
- Walker, G. and D. Weber**, 1984, "A transaction cost approach to make-or-buy decisions". *Administrative Science Quarterly*, **29**: 373–391.
- Wang, L., J. Yeung and M. Zhang**, 2011, "The impact of trust and contract on innovation performance: The moderating role of environmental uncertainty". *International Journal of Production Economics*, **134**: 114–122.
- Williamson, O.**, 1979, "Transaction-cost economics: The governance of contractual relations". *Journal of Law & Economics*, **22**: 628–652.
- Williamson, O.**, 1985, *The economic institutions of capitalism*. New York: Free Press.
- Woodman, R. W., J. E. Sawyer and R. W. Griffin**, 1993, "Toward a theory of organizational creativity". *Academy of Management Review*, **18**: 293–321.
- Zaheer, A., B. McEvily and V. Perrone**, 1998, "Does trust matter? Exploring the effects of interorganizational and interpersonal trust on performance". *Organization Science*, **9**: 141–159.
- Zhang, C., S. T. Cavusgil and A. S. Roath**, 2003, "Manufacturer governance of foreign distributor relationships: do relational norms enhance competitiveness in the export market?". *Journal of International Business Studies*, **34**: 550–566.