# Relational and Structural Embeddedness as Buyer-Supplier Network Governance Mechanism: The Role of Market Uncertainty

*Nursen Aydin*
*Warwick Business School*

*Young-seok Choi*
*Loughborough University*

*Ha-bin Lee*
*Brunel Business School*

*Byung-Gak Son (b.g.son@city.ac.uk)*
*Cass Business School*

## Abstract

Relational or structural embeddedness play an important role in mitigating partner opportunism in a buyer-supplier relationship. However, we do not fully understand when and how each type of embeddedness works better than the other in the context of information service outsourcing (ISO). This paper aims to fill this gap by comparing the two different dimensions of embeddedness in suppressing supplier opportunism in the presence of two uncertainties prevalent in ISO business environments: which are technological unpredictability and measurement difficulty. For this, we use the game-based simulation approach to model ISO market as a network of service suppliers where a single supplier (a consortium co-ordinator) takes a role of forming a consortium with other suppliers, managing it to the end of a project.

**Key words:** Opportunism; uncertainty; embeddedness; buyer-supplier relationship

## Introduction

Participating in an economic exchange exposes the firms involved to various exchange hazards (Poppo and Zenger, 2002). One of the most discussed such hazards in information service outsourcing (ISO) literature is 'partner opportunism' (Lacity et al. 2010). Partner opportunism refers to an act or behaviour of an exchange partner for its own unilateral gains at the expense of its counterpart (Williamson, 1975; Poppo and Zenger, 2002; Luo, 2007). An inter-firm alliance including a vendor consortium is marred with the hazard of partner opportunism. For example, Batrionics, an Australian battery manufacturer, formed a joint venture for its Chinese operation with Red Dragon Enterprise. Later it realised that its partner greatly exaggerated its capability and financial resources (Rarick, 2004). Furthermore, scholars found that such partner opportunism is prevalent in their empirical research in various types of outsourcing relationships such as IT (Dibbern et al., 2008; Kang et al., 2016; Handley and Benton, 2012), logistics (Handley and Benton, 2012), and R&D (Carlson et al., 2006).

Indeed, partner opportunism in an alliance can do serious economic and relational damage (Handley and Benton 2012; Luo, 2007; Morgan et al., 2007) and it is one of the main causes of undesirable outcomes such as cost escalation and service debasement in information service outsourcing (ISO) (Aubert et al. 1998; Handley & Benton Jr, 2012). The prevention of this behaviour is, therefore, one of the important factors for alliance success (XXX). A firm typically rely on contractual means to mitigate the threat of partner opportunism (Artz and Brush, 2000; Liu et al. 2009; Lumineau and Henderson 2012; Nooterboom and Noorderhaven, 1997; Perry et al., 2004; Poppo and Zenger, 2002). Another mechanism for partner opportunism mitigation is firm's own and other's embeddedness (or social ties) (Lumineau and Henderson 2012; Poppo et al., 2008), which is the focus of this research. Such mechanism is based on the notion that that economic exchanges are embedded in a relationship (Deeds and Hill, 1999) and such embeddedness (or social ties) would act as an effective and cost-efficient alternative to complex legal contract in opportunism mitigation (Granovetter, 1985; Gulati, 1995; Hill, 1990; Uzzi, 1997). Scholars took two distinctive approaches for understanding the role of social ties in opportunism mitigation by considering its structural embeddedness (configuration) and relational embeddedness (quality), (Autry and Griffis, 2008; Dong et al., 2015; Granovetter, 1985; Kim and Henderson, 2015; Gulati, 1998; Moran; 2005; Rowley et al., 2000; Uzzi, 1996, 1997; Uzzi and Lancaster, 2003).

The co-ordinator of an ISO vendor consortium can be exposed to different types of opportunism, for example, its suppliers not committing promised resources to a project, and their embeddedness in the supplier network can be a useful tool for its mitigation alongside with a contractual based mechanism. Embeddedness based mitigation mechanism is particularly useful at the very early stage of a project life cycle, consortium formation, when a co-ordinator select its suppliers. In general, a consortium co-ordinator has two partner selection choices, which are (1) exploitation (selecting a partner with a prior tie) and (2) exploration (selecting a partner outside of its usual supplier network) (Beckam et al., 2004; Galaskiewicz and Shatin, 1981; Gulati, 1995; Li and Rowley, 2002). In either cases, a co-ordinator can use embeddedness as a tool to minimise the risk of selecting a supplier with tendency to behave opportunistically. For a potential partner with a prior tie, the co-ordinator can refer to its past experience with the supplier (relational embeddedness) for such purpose (Geringer, 1991; Gulati et al., 1999; Meuleman et al., 2006). For a potential partner without a prior tie, its structural embeddedness can be useful means to gauge its reputation. A potential partner occupying a central location in its network would signal its reputation (Borgatti and Foster 2003; Podolny, 1993). A reputable company is less like to behave opportunistically (Malik and Bouguettaya 2009; Heng et al. 2009).

Similar to any other types of project, an ISO project is characterised by various uncertainties, which are closely related to the extent of partner opportunism (Aubert et al. 1999; Carson et al., 2006; Eisenhardt, 1989; Folta, 2008; Luo, 2007; Perry et al., 2004; Poppo and Zenger, 2002; Wathne and Heide, 2000). Two most prevalent forms of uncertainties of any ISO project are technological uncertainty (TU) and measurement difficulties (MD) (Kim and Chung 2003; Lacity et al. 2010). TU refers to "the inability to accurately forecast the technology sets that are required in future business opportunities by the market for the products of the alliance" (Perry et al., 2004). MD refers to the degree of difficulty in measuring the performance of exchange partner (Eisenhardt, 1989; Lacity et al., 2010; Poppo and Zenger, 2002). Both TU and MD is related to the level of supplier opportunism due as its presence would increase the uncertainty of the supplier's project earnings (Folta, 2008; Luo, 2007; Poppo and Zenger, 2002). Also, high level of MD and TU would render the efficiency of contract based mitigation mechanism (Handley and Benton, 2012; Luo, 2007; Rindfleisch and Heide, 1997) as well as monitoring efforts (Carson et al., 2006; Wathne and Heide, 2000).

It is not fully understood, however, which type of embeddedness is more efficient in supplier opportunism mitigation at the supplier selection stage of an ISO project, when faced with the different level of project TU and MD. Using a game-based simulation approach, we seek to fill this theoretical gap by investigating the efficacy of different types of embeddedness based mitigation mechanism at the formation stage of an ISO consortium. A game-based simulation approach can build a model based on reasonable assumption and can appropriately demonstrate the behaviour of actors who compose a network and affect one another through their interactions, and the performance which is the consequence of their behaviour (Harrison et al. 2007). In addition, this approach is proper in case of challenging to obtain sufficient empirical data at the different levels of the two uncertainties in long-term periods (Davis et al. 2007). Also, traditional approach to develop variance based theories has limitation to reveal the mechanism underlying the cause-effect relationships among variables. Game based simulation approach has widely been used to design and evaluate market mechanisms in Economics (references) and can reveal pros and cons of different mechanisms in diverse market conditions.

The paper itself is at the conceptual level at the moment and, if possible, the results will be presented at the conference in June.

## Theoretical Backgrounds

Partner Opportunism and Embeddedness-based Mitigation Mechanism:

Partner opportunism refers to an act or behaviour of an exchange partner for its own unilateral gains at the expense of its counterpart and (Luo, 2007; Poppo and Zenger, 2002; Williamson, 1975). Partner opportunism in an inter-firm alliance is multi-dimensional concept including several types of behaviours (Deeds and Hill, 1999). The first type is failing to commit or withhold resources to the joint efforts (Aron et al., 2005; Das and Teng 1996; Deeds and Hill, 1999; Eisenhardt 1989; Kandori 1992; Handley and Benton, 2012; Luo, 2007; Shapiro and Stiglitz 1984), which is intentional but passive (Aron et al., 2005; Handley and Benton, 2012). The second type is a firm distorting information to its exchange partner for its own gains (Deeds and Hill, 1999) such as mis-representing one's abilities (Deeds and Hill, 1999; Luo, 2007). Needless to say direct financial consequence of opportunism, it can have negative performance impact, as (1) its mitigation requires significant amount of firms' resources (Das and Teng, 1996; Luo, 2005; Teece, 1986; Poppo and Zenger, 2002) and (2) it prevents accumulation of social capital (Granovetter, 1992; Luo, 2007; Smith and Barclay, 1997; Son et la., 2016; Tangpong, et al., 2010), which is critical for a successful exchange relationship (Carey et al., 2011; Krause et al., 2007; Lawson et al., 2008). Controlling such exchange hazard, therefore, has been one of the critical research topics for ISO literature.

A firm can rely on (1) contractual governance or/and (2) relational governance to mitigate the threat of partner opportunism (Artz and Brush, 2000; Liu et al. 2009; Lumineau and Henderson 2012; Nooterboom and Noorderhaven, 1997; Perry et al., 2004; Poppo and Zenger, 2002). In many cases, firms try to mitigate the hazard of opportunism using a formal legal contract (Artz and Brush, 2000; Das and Teng, 1996; Eisenhardt, 1989; Lumineau and Henderson 2012; Poppo and Zenger, 2002). A formal contract deters partner opportunism by creating ex-post cost to opportunistic behaviours to the defected party (Williamson, 1985). However, a contract is an imperfect tool to control opportunism (Crocker and Masten, 1991; Artz and Brush, 2000) since (1) developing a comprehensive contract for all eventuality would be difficult due to bounded rationality (Lumineau and Henderson 2012; Williamson 1979) and (2) is costly (Teece, 1986). Moreover, enforcement of a contract is resource intensive (Dickson et al., 2006; Teece, 1986).

Another mechanism for a firm to mitigate partner opportunism is relying on its own and others' embeddedness (or social ties) (Lumineau and Henderson 2012; Poppo et al., 2008). Such mechanism is called non-contractual mitigation mechanism (Artz and Brush, 2000; Lumineau and Henderson 2012) or "relational contract". The idea of non-contractual mitigation mechanism is based on the notion that that economic exchanges are embedded in a relationship (Deeds and Hill, 1999) and embeddedness (or social ties) would act as an effective and cost efficient alternative to complex legal contract in opportunism mitigation (Granovetter, 1985; Gulati, 1995; Hill, 1990; Uzzi, 1997). Scholars took two distinctive approaches for understanding the place of embeddedness (or social ties) in an exchange relationship by looking not only into their configurations (structural embeddedness) but also their quality (relational embeddedness), (Autry and Griffis, 2008; Dong et al., 2015; Granovetter, 1985; Kim and Henderson, 2015; Gulati, 1998; Moran; 2005; Rowley et al., 2000; Uzzi, 1996, 1997; Uzzi and Lancaster, 2003).

Relational embeddedness refers to the strength of dyadic ties (Granovetter, 1973; Kim, 2014; Moran, 2005) that is the extent to which it develops close and personal relationships with other members in a network (Dong et al., 2015). Relational embeddedness is created and leveraged during the history of interaction between actors (Granovetter, 1990), and is a multi-dimensional concept (Nahapiet and Ghoshal, 1998) including trust (Putnam, 1995), benevolence (Carey et al., 2011), commitment (Coleman, 1994) and obligation (Coleman, 1994; Granovetter, 1992). Relational embeddedness functions as an informal governance mechanism complementing a contractual governance (Rowley et al., 2000; Tangpong et al., 2010; Lumineau et al., 2012) in mitigating partner opportunism in following ways. Firstly, repeated interactions with partners can provide the firm information about their incentives to behave opportunistically and this enables the firm to come up with effective mitigation strategy (Barden and Mitchell, 2007; Uzzi, 1997). Secondly, the main outcome of positive interactions is an accumulation of goodwill and trust (Granovetter, 1992; Tangpong, et al., 2010, Smith and Barclay, 1997; Son et al., 2016). Such relational outputs alleviate fears of opportunism in the relationship and foster a sense of openness and reciprocity (Kale et al, 2000; Tsai and Ghoshal, 1998; Zaheer et al., 1998). Similarly resulting outcomes such as commitment and obligation would serve to uphold agreed norms of interaction reducing partner opportunism (Coleman, 1994, 1998; Granovetter, 1992; Perry et al., 2004). Thirdly, positive interactions in the past, would increase parties' expectation of the continuity of their relationship. Such expectation of continuity reduces partner opportunism (Heide and Miner, 1992; Heide, 1994; Nooterboom and Noorderhaven, 1997; Artz and Brush, 2000; Luo, 2007), since it encourages them to look at long-term return from the relationship (Poppo and Zenger, 2002).

Structural embeddedness refers to impersonal configuration of linkages/relationships among actors (Barden and Mitchell, 2007; Dong et al., 2015; Grewal et al., 2006; Gulati and

Gargiulo, 1999; Nahapiet and Ghoshal, 1998; Moran, 2005). While, relational embeddedness is at dyadic and personal level (Autry and Griffis, 2008; Barden and Mitchell; 2007 Landoli et al., 2012), structural embeddedness is related to impersonal and network level (Barden and Mitchell, 2007; Dong et al., 2015; Landoli et al., 2012; Nahapiet and Ghoshal, 1998). While relational embeddedness acts as a mitigation mechanism at dyadic level, structural embeddedness based mechanism works at network level (Deeds and Hill, 1999; Granovetter, 1985; Nooterboom and Noorderhaven, 1997; Williamson, 1975). Firstly, a firm's network position represents its reputation which is an indicator of past performance and a predictor of future behaviour (Malik and Bouguettaya 2009; Heng et al. 2009). For example, a potential partner occupying a central location in a network would signal the others its reputation (Borgatti and Foster 2003; Podolny, 1993), which is a collective measure of its reliability rooted in the evaluation of counterparties (Jøsang et al. 2007, Lee and Roh 2012). For this reason, at the formation stage of an ISO consortium, by checking a potential partner's network position, a co-ordinator can reduce a chance of selecting untrustworthy partners. At the execution stage, if such partners behave non-collaboratively in a relationship, such news would travel fast through a network and could potentially damage its reputation (Aral and Walker, 2014; Rowley et al., 2000). Therefore, a reputational partner (e.g., high level of network centrality) would refrain from behaving opportunistically because the damage on its reputation caused by such behaviour is proportionally larger than those with lesser degree of structural embeddedness (Kandori 1992).

The above two forms of non-contractual mitigation mechanism should be deployed complementarily rather than as a substitute to a formal contract for the purpose of overcoming its limitations (e.g., inflexibility of contractual governance) (Artz and Brush, 2000; Liu et al. 2009; Lumineau and Henderson 2012; Perry et al., 2004; Poppo and Zenger, 2002).

Partner Opportunism and Uncertainties of ISO (Technological Unpredictability and Measurement Difficulty):

The link between different types of uncertainty and partner opportunism has been extensively investigated by researchers (e.g., Dickson et al., 2006; Dyer, 1997; Joshi and Stump, 1999; Luo, 2007; Poppo and Zenger, 2002; Sako and Helper, 1998; Williamson, 1999). Among them, technological uncertainty and measurement difficulty are particularly relevant for this study, since these are two of the most widely studied transactional attributes in ISO literature (Kim and Chung 2003; Lacity et al., 2010).

Technological uncertainty is an exogenous uncertainty (Folta, 2008), which refers to "the inability to accurately forecast the technology sets that are required in future business opportunities by the market for the products of the alliance" (Perry et al., 2004). In ISO context, it is related to the definition of IS requirements, emerging technologies, and/or environmental factors" (Lacity et al. 2010). Technological uncertainty would expose a firm to a problem raised from unforeseen changes, however, such exogenous uncertainty is generally beyond a firm's control (Folta, 2008; Poppo and Zenger, 2002). Therefore, when exposed to it, a firm tends to behave opportunistically, for example, limiting resources commitment to a joint project, to decrease its exposure to negative consequences such as a project failure (Folta, 2008; Luo, 2007). Secondly, high level of technological uncertainty will make (1) developing a contractual safeguard against opportunistic behaviours, (2) monitoring and enforcing it (Handley and Benton, 2012; Luo, 2007; Rindfleisch and Heide, 1997), and (3) contract renewal and related negotiations (Poppo and Zenger, 2002) difficult and costly. This would significantly impair the efficacy of contractual mitigation mechanism resulting in increase in partner opportunistic behaviours. Considering the nature of ISO industry, where the technology clock speed is fast, and such uncertainty poses a significant exchange hazards to consortium leaders (Poppo and

Zenger, 2002).

Measurement difficulty refers to the degree of difficulty in measuring the performance of exchange partner (Eisenhardt, 1989; Lacity et al., 2010; Poppo and Zenger, 2002). Unlike to technological uncertainty, measurement difficulty is task specific, which arises when execution requires joint efforts with substantial time requirement (Eisenhardt, 1989). From agency theory perspective, it specifically refers to a situation, where a principal has difficulty in measuring the performance of its agency (Eisenhardt, 1989). Such difficulty has been linked with an agent opportunism in the form of withholding resources commitment (Eisenhardt, 1989). This is mainly because an appropriate reward requires accurate measurement (Poppo and Zenger, 2002). If an agent perceives the uncertainty related to its reward increases due to the principal's inability to measure its contribution accurately, it might decide to limit its resources and efforts for the exchange (Eisenhardt, 1989; Poppo and Zenger, 2002). Moreover, the presence of measurement difficulty in an exchange suggests (1) the existence of complexity (Eisenhardt, 1989) and (2) the lack of investment by the principal for monitoring (Poppo and Zenger, 2002). Resulting information asymmetry will make it difficult for a principal to detect the agent defection, therefore, increases the chance of the agent behaves opportunistically (Carson et al., 2006; Wathne and Heide, 2000).

Partner Selection Strategy:

Embeddedness-based mitigation mechanism is especially useful at the initial stage of an alliance formation. The topic of partner selection has received relatively low attention in alliance research (Dekker, 2008; Li et al., 2008). Rushing in partner selection can have serious consequence (Shan and Swaminathan (2008); Hamel, 1999), therefore critical for alliance success (Büyüközkan et al., 2008; Cummings and Holmberg, 2012; Hitt et al., 2000; Holmberg and Cummings, 2009; Li et al., 2008; Meuleman et al., (2006). However, selecting a right partner is a difficult task since it is full of uncertainties (Li and Rowley, 2002). The main focus of the partner selection literature has been to understand when a firm select a new partner (exploration) or a partner with a prior tie (exploitation) (Beckam et al., 2004; Galaskiewicz and Shatin, 1981; Gulati, 1995; Li and Rowley, 2002).

Positive past engagement is the main reason for a firm to return to partners with prior experience (Geringer, 1991). Moreover, from the inertia perspective, a firm tend to reply on historical experience and return to known solutions when faced with high-level of uncertainty (Li and Rowley 2002). Selecting partners with prior ties will help a firm to (1) reduce cost and time requirement for searching for a new partner (Barden and Mitchell, 2007; Chung et al., 2000; Hagedoorn, 2006; Goo et al. 2007; Gulati and Gargiulo, 1999; Li and Rowley, 2002) and (2) enhance collaboration efficiency due to the resulting familiarity (Barden and Mitchell, 2007; Hagedoorn, 2006). Also, repeated interaction would result in accumulation of social capital such as trust, commitment and benevolence, which provide positive performance impact on firms (Brown et al. 2004; Carey et al., 2011; Hagedoorn, 2006; Son et al., 2016). Selecting a partner with an existing tie, however, would create "path-dependent" learning reducing a firm's capability to innovate (Li et al., 2008). In addition, repeated interactions would make a firm more vulnerable, since such partners can appropriate the firm's knowledge easily due to the familiarity to its know-how, operating routines and managerial practices (Li et al., 2008; Li and Rowley, 2002).

There are situations when a company seeks for a new partner for an alliance beyond its usual circle. Such selection strategy will enable a firm to have access to a new knowledge and a novel innovation (Bellamy, 2014; Borgatti and Li, 2009; Li et al., 2008; Li and Rowley, 2002). Therefore, if the purpose of an alliance is for creating innovation or requires new knowledge to achieve its goals, a firm tends to search for a new partner beyond the boundary of its usual network. For this reason, firms in a fast-growing industry with highly dynamic environments

(such as ISO) tend to favour exploration strategy for alliance formation, since (Rowley et al. 2000; Yamakawa et al. 2011) novel information from distant partners is a key to firm's survival. Also, a firm faces a firm-specific uncertainty, which is unique to itself, it can try to control it by diversification (Brealey and Myers, 2003) by seeking for a new partner with new information and resources (Granovetter 1973, Beckam et al., 2004). In ISO consortium formation, technical requirements may change for different IT services, therefore forming a consortium may require a coordinator to seek out new partners to fill technical gaps, when such capability does not exist in its usual suppliers. In some cases, a firm considers switching to a new partner despite the existing partners pose required technology, skills and resources for various reasons such as seeking for better price and dissatisfaction with prior interactions (Ferguson and Johnston, 2011; Low and Johnston, 2006). In any case, working with new partners can potentially expose co-ordinators to the risk of opportunistic behaviours from new partners due to information asymmetry on the new technologies, for example.

**Simulation Model**

Single partner dominant multi-vendor outsourcing, which is widely used in ISO market (Koo et al. 2017), is assumed in this study. This model is preferred also widely used by European Commission for awarding and managing research projects (Drath and Wayman 2010). The developed simulation model reflects the efforts to establish ISO consortia with suitable partners, which are frequently observed in the real ISO market in which the coordinators of the projects strive for building their consortia with reliable and competent partners to win a project. Then, a full factorial design of experiment is going to be used for efficient simulation tests and systematic analyses. An experimental design has two or more factors and each of them has discrete possible values, which are called levels. The combinations of levels are also called experimental points. Then, the tests at all of the possible experimental points are conducted in a full factorial design. Therefore, this experimental design is beneficial when the interaction effects of two or more factors on outcomes are investigated. Furthermore, a full factorial design including factors (for these study, TU and MD) especially with two levels is widely used in research work because the results drawn from this fundamental design perform the role of a basis of other designs with a variety of practical levels (Montgomery, 2009).

## References


Adler, P. S., S. -W. Kwon. 2002. Social capital: Prospects for a new concept. *Acad. Management Rev.* **27**(1) 17-40.

Afuah, A. 2000. How much do your co-opetitors' capabilities matter in the face of technological change? *Strategic Management J.* **21**(3) 397-404.

Aubert, B. A., S. Dussault, M. Patry, S. Rivard. 1999. Managing the risk of IT outsourcing. *Proc. 32nd Annual Hawaii Internat. Conf. System Sciences,* Hawaii.

Aubert, B. A., M. Patry, S. Rivard. 1998. Assessing the risk of IT outsourcing. *Proc. 31st Annual Hawaii Internat.Conf. System Sciences*, Hawaii.

Bahli, B. and Rivard, S. 2013. Cost escalation in information technology outsourcing: A moderated mediation study. Deision Support System 56 37 – 47.

Balaji, S., C. V. Brown. 2010. The effects of client governance mechanisms relational exchange on IS outsourcing effectiveness. *Proc. 31st Internat. Conf. Inform. Systems*, St. Louis.

Banerjee, A. V., E. Duflo. 2000. Reputation effects and the limits of contracting: A study of the indian software industry. *Quart. J. Econom.* **115**(3) 989-1017.

Barthelemy, J. 2001. The hidden costs of IT outsourcing. *MIT Sloan Management Rev.* **42**(3) 60-69.

Beckman, C. M., P. R. Haunschild, D. J. Phillips. 2004. Friends or strangers? Firm-specific uncertainty, market uncertainty, and network partner selection. *Organ. Sci.* **15**(3) 259-275.

Borgatti, S. P., P. C. Foster. 2003. The network paradigm in organizational research: A review and typology. *J. Management* **29**(6) 991-1013.

Brown, M., A. Falk, E. Fehr. 2004. Relational contracts and the nature of market interactions. *Econometrica* **72**(3) 747-780.

Davis, J. P., K. M. Eisenhardt, C. B. Bingham. 2007. Developing theory through simulation methods. *Acad. Management Rev.* **32**(2) 480-499.

De Leeuw, T., Lokshin, B., and Duysters, G. 2014. Returns to alliance portfolio diversity: The relative effects of partner diversity on firm's innovative performance and productivity. Journal of Business Research 67, 1839 - 1849.

Dibbern, J., T. Goles, R. Hirschheim, B. Jayatilaka. 2004. Information systems outsourcing: A survey and analysis of the literature. *ACM SIGMIS Database* **35**(4) 6-102.

DiMaggio, P., H. Louch. 1998. Socially embedded consumer transactions: For what kinds of purchases do people most often use networks? *Amer. Sociol. Rev.* **63**(5) 619-637.

Drath, P., S. Wayman. 2010. *How research project co-ordinators choose partners for ICT proposals (report for a survey)*, Ideal-ist, Document D5.6.1. http://www.ideal-ist.eu/sites/default/files/news/D5-6-1.doc

Dwyer, F. R., P. H. Schurr, S. Oh. 1987. Developing buyer-seller relationships. *J. Marketing* **51**(2) 11-27.

Eisenhardt, K. M. 1989. Agency theory: An assessment and review. *Acad. Management Rev.* **14**(1) 57-74.

Flemming, R., G. Low. 2007. Information systems outsourcing relationship model. *Aust. J. Inform. Systems* **14**(2) 95-112.

Gargiulo, M., M. Benassi. 2000. Trapped in your own net? Network cohesion, structural holes, and the adaptations of social capital. *Organ. Sci.* **11**(2) 183-196.

Garvin, D. A. 1988. *Managing quality: The strategic and competitive edge*. Free Press, New York.

Gilsing, V., Vanhaverbeke, W., and Pieters, M. 2014. Mind the gap. Balancing alliance network and technology portfolios during periods of technological uncertainty. Technological Forecasting & Social Change 81, 351 – 362.

Goo, J., R. Kishore, K. Nam, H. R. Rao, Y. Song. 2007. An investigation of factors that influence the duration of IT outsourcing relationships. *Decision Support Systems* **42**(4) 2107-2125.

Granovetter, M. 1995. *Getting a job: A study of contacts and careers*, University Of Chicago Press.

Handley, S.M. and Benton Jr., W.C. 2012. The influence of exchange hazards and power on opportunism in outsourcing relationships. Journal of Operations Management 30 55 – 68.

Hansen, M. T. 1999. The search-transfer problem: The role of weak ties in sharing knowledge across organization subunits. *Administrative Sci. Quart.* **44**(1) 82-111.

Harrison, J. R., Z. Lin, G. R. Carroll, K. M. Carley. 2007. Simulation modeling in organizational and management research. *Acad. Management Rev.* **32**(4) 1229-1245.

Heng, C. S., W. Du, Y. Feng. 2009. Investigating vendors' decision to terminate IT oursourcing contracts. *Proc. 30th Interanat. Conf. Inform. Systems*, Phoenix.

Hill, C. W. L. 1990. Cooperation, opportunism, and the invisible hand: Implications for transaction cost theory. *Acad. Management Rev.* **15**(3) 500-513.

Jøsang, A., R. Ismail, C. Boyd. 2007. A survey of trust and reputation systems for online service provision. *Decision Support Systems* **43**(2) 618-644.

Kandori, M. 1992. Social norms and community enforcement. *Rev. Econom. Stud.* **59**(1) 63-80.

Kern, T., L. Willcocks. 2002. Exploring relationships in information technology outsourcing: The interaction approach. *Eur. J. Inform. Systems* **11**(1) 3-19.

Ketler, K., J. Walstrom. 1993. The outsourcing decision. *Internat. J. Inform. Management* **13**(6) 449-459.

Kim, S., Y. S. Chung. 2003. Critical success factors for is outsourcing implementation from an interorganizational relationship perspective. *J. Comput. Inform. Systems* **43**(4) 81-90.

Koo, Y., Lee, J.N., Heng, C.S., and Park, J. 2017. Effect of multi-vendor outsourcing on organizational learning: A social relation perspective. Information & Management 54 (3), 396 – 413.

Kraatz, M. S. 1998. Learning by association? Interorganizational networks and adaptation to environmental change. *Acad. Management J.* 41(6) 621-643.

Kronman, A. T. 1985. Contract law and the state of nature. *J. Law, Econom. Organ.* **1**(1) 5-32.

Lacity, M. C., S. Khan, A. Yan, L. P. Willcocks. 2010. A review of the IT outsourcing empirical literature and future research directions. *J. Inform. Technology* **25**(4) 395-433.

Lant, T. K., F. J. Milliken, B. Batra. 1992. The role of managerial learning and interpretation in strategic persistence and reorientation: An empirical exploration. *Strategic Management J.* **13**(8) 585-608.

Larson, A. 1992. Network dyads in entrepreneurial settings: A study of the governance of exchange relationships. *Administrative Sci. Quart.* **37**(1) 76-104.

Lee, J. -N., Y. -G. Kim. 1999. Effect of partnership quality on is outsourcing: Conceptual framework and empirical validation. *J. Management Inform. Systems* **15**(4) 29-61.

Lee, J. -N., Y. -G. Kim. 2005. Understanding outsourcing partnership: A comparison of three theoretical perspectives. *IEEE Trans. Engrg. Management* **52**(1) 43-58.

Lee, J., J. Lee, H. Lee. 2003. Exploration and exploitation in the presence of network externalities. *Management Sci.* **49**(4) 553-570.

Lee, J., J. J. Roh. 2012. Revisiting corporate reputation and firm peformance link. *Benchmarking: An Internat. J.* **19**(4) 649-664.

Levie, D. and Rosenkopf, L. 2006. Balancing exploration and exploitation in alliance formation. Academy of Management Journal 49 (4) 797 – 818.

Lin, N. 1999. Building a network theory of social capital. *Connections*, **22**(1) 28-51.

Malik, Z., A. Bouguettaya. 2009. Rateweb: Reputation assessment for trust establishment among web services. *VLDB J.* **18**(4) 885-911.

March, J. G. 1991. Exploration and exploitation in organizational learning. *Organ. Sci.* **2**(1) 71-87.

McFarlan, F. W., R. L. Nolan. 1995. How to manage an IT outsourcing alliance. *Sloan Management Rev.* **36**(2) 9-23.

Montgomery, D. C. 2009. *Design and analysis of experiments*. John Wiley & Sons, New York.

Moran, P. 2005. Structural vs. Relational embeddedness: Social capital and managerial performance. *Strategic Management J.* **26**(12) 1129-1151.

Nahapiet, J., S. Ghoshal. 1998. Social capital, intellectual capital, and the organizational advantage. *Acad. Management Rev.* **23**(2) 242-266.

Nam, K., S. Rajagopalan, H. R. Rao, A. Chaudhury. 1996. A two-level investigation of information systems outsourcing. *Communication of the ACM* **39**(7) 36-44.

Podolny, J. M. 1994. Market uncertainty and the social character of economic exchange. *Administrative Sci. Quart.* **39**(3) 458-483.

Podolny, J. M. 2001. Networks as the pipes and prisms of the market. *Amer. J. Sociol.* **107**(1) 33-60.

Poppo, L., T. Zenger. 2002. Do formal contracts and relational governance function as substitutes or complements? *Strategic Management J.* **23**(8) 707-725.

Provan, K. G., A. Fish, J. Sydow. 2007. Interorganizational networks at the network level: A review of the empirical literature on whole networks. *J. Management* **33**(3) 479-516.

Ravindran, K., A. Susarla, V. Gurbaxani. 2009. Social network and contract enforcement in IT outsourcing. *Proc. 30th Internat. Conf. Inform. Systems*, Phoenix.

Ring, P. S., A. H. Van de Ven. 1992. Structuring cooperative relationships between organizations. *Strategic Management J.* **13**(7) 483-498.

Robertson, T. S., H. Gatignon. 1998. Technology development mode: A transaction cost conceptualization. *Strategic Management J.* **19**(6) 515-531.

Rowley, T., D. Behrens, D. Krackhardt. 2000. Redundant governance structures: An analysis of structural and relational embeddedness in the steel and semiconductor industries. *Strategic Management J.* **21**(3) 369-386.

Shapiro, C., J. E. Stiglitz. 1984. Equilibrium unemployment as a worker discipline device. *Amer. Econom. Rev.* **74**(3) 433-444.

Susarla, A., Subramanyam, R., and Karhade, P. 2010. Contractual Provisions to Mitigate Holdup: Evidence from Information Technology Outsourcing. Information Systems Research 21 (1) 37 – 55.

Uzzi, B. 1996. The sources and consequences of embeddedness for the economic performance of organizations: The network effect. *Amer. Sociol. Rev.* **61**(4) 674-698.

Uzzi, B. 1997. Social structure and competition in interfirm networks: The paradox of embeddedness. *Administrative Sci. Quart.* **42**(1) 35-67.

Wasserman, S., K. Faust. 1994, *Social network analysis: Methods and applications*. Cambridge University Press, New York.

Williamson, O. E. 1991. Comparative economic organization: The analysis of discrete structural alternatives. *Administrative Sci. Quart.* **36**(2) 269-296.

Wiener, M., Saunders, C. (2014) Forced coopetition in IT multi-sourcing, Journal of Strategic Information Systems, 23 (3), 210-225.

Yamakawa, Y., Yang, H., and Lin, Z. 2011. Exploration versus exploitation in alliance portfolio: Performance implications of organizational. Strategic, and environmental fit. Research Policy 40, 287 – 296.