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The Choice and Effects of Governance Mechanisms for Regulating Client-Contractor Relationships in Large Construction Projects

By

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ABSTRACT

Poor project governance is the main cause of project failure for complex projects. Historically, formal contracting has been the mainstay of project governance for outsourced projects, but in practice, the adversarial and 'incomplete' nature of contractual arrangements has shifted the attentions to the use of alternative governance mechanisms to contracts—relational governance mechanisms. Subsequently, researchers began to study the conditions surrounding the choice and effects of contractual and relational governance mechanisms as well as the interactions between them. Despite the progresses made, there exist gaps in the literature on project governance.

First, the definition of relational governance and its roles in exchange relationships are still vague which contributes to inconsistent research findings. While some studies refer to prior ties, shared norms, and trust as relational mechanisms, others consider these factors as antecedents for the choice between formal contracting and relational contracting in exchange relationships. Furthermore, some studies do not differentiate between the social assets that are embedded within partners' social ties, and joint actions that are implemented through their transactions. These varied interpretations and measurements of the same construct have led to inconsistent findings (e.g., substitutability versus complementarity of relational mechanisms and formal contracts). Drawing upon social capital theory and social exchange theory, this thesis conceptualizes social capital (e.g., prior ties, shared norms, and trust) as ex-ante relational governance mechanism, and

collaboration between partners (e.g., information exchange, joint actions) as ex-post relational governance mechanism to investigate their effects on project performance.

Second, while the ability of partners to observe project team behavior and measure their achievements, and while their knowledge of task organization and resource allocation are considered to be the predicting factors for the choice and effects of governance mechanisms, the impact of governance mechanisms on development of these control capabilities as well as the intervening effect of these developed capabilities on the efficacy of governance mechanisms are unknown. Borrowing from control theory, this study conceptualizes 'project control capability' as a new construct and posits that 'project control capability' not only is affected and enhanced by the use of governance mechanisms, but also plays a mediating role on the way through which governance mechanisms impact on exchange performance.

Finally, despite calls to examine the contingent effect of cultural and legal conditions on the choice and effects of governance mechanisms, few empirical studies have addressed this concern. Drawing on institutional theory, this thesis studies the impact of individualistic/collectivistic culture and low/high contract enforceability on the efficacy of governance mechanisms by conducting a comparative research in two culturally and legally contrasting contexts: Iran and Australia.

A questionnaire survey was designed and implemented targeting executive/project managers of large construction companies in Iran and Australia to study the choice and effects of governance mechanisms in regulating client-contractor relationships in large construction projects. Data collected from 73 Iranian and 38 Australian client-contractor partnerships were then analyzed using the Partial Least Squares Structural Equation Modeling (PLS-SEM) method to test the research hypotheses and validate the research model.

The contributions of this study are threefold; first, it contributes to social capital theory and social exchange theory by revealing that social capital and collaboration play different roles in regulating exchange relationships; for example, the results showed that where there is no substitutive or complementary relationship between social capital and formal contract, collaboration and formal contract complement each other. Second, it contributes to the inter-organizational relationships (IORs) and project management literature by introducing a new construct of 'project control capability' and showing the importance of its role in transaction performance; for example, the findings showed that if collaboration is not effectively implemented to enhance 'project control capability', its impact on project performance will disappear. Third, this thesis enriches the IORs literature by identifying and elaborating how culture and contract enforceability influence the choice and effects of governance mechanisms. For instance, the findings showed that while collaboration is the main contributor to relationship satisfaction in Australia as an individualistic country with high contract enforceability, social capital is the main motivator for relationship satisfaction in Iran with its collectivistic culture and low contract enforceability. Together, this study provides important theoretical and managerial insights and opens the way for more research within IORs context, particularly with regard to complex conditions in large construction projects.

Keywords: *formal contract, social capital, collaboration, project control capability, individualism, contract enforceability.*

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ABBREVIATIONS

CB-SEM	Covariance-based structural equation modeling
CL	Collaboration
FC	Formal contract
IDV	Individualism vs. collectivism
IORs	Inter-organizational relationships
PC	Project control capability
PLS-SEM	Partial least square structural equation modeling
PMP	Performance measurement process
PP	Project performance
PT	Prior ties
RBV	Resource-based view
RS	Relationship satisfaction
SC	Social capital
SCT	Social capital theory
SET	Social exchange theory
SME	Small business enterprise
SN	Shared norms
TCE	Transaction cost economics
TR	Trust
TSI	Transaction-specific investments
UN-ESCAP	United Nations Economic and Social Commission for Asia and the Pacific
WGI	Worldwide governance indicators

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CHAPTER ONE: INTRODUCTION

- ***Background***
- ***Research purpose***
- ***Research questions***
- ***Research design***
- ***Research findings and contributions***
- ***Outline of Chapters***

1.1 Background

Client-contractor relationships in large construction projects have never been simple as what is being delivered is a complex capital asset that will be used over many years (Roehrich & Lewis, 2010). These complex transactions have usually been subject to adversarial relationships and consequently have called for deploying inter-organizational governance mechanisms as remedies for mitigating the adverse consequences (Latham, 1994; Ling, Ning, Ke, & Kumaraswamy, 2013; Ng, Rose, Mak, & Chen, 2002). Detailed formal contracting has been considered as one of the regular solutions through clarifying the legally binding rights and responsibilities of both parties in the relationship (Roehrich & Lewis, 2010), however subsequent studies found that reliance on formal contracting typically results in adversarial relationships between clients and contractors in large construction projects, which exacerbates chances of project failure by thwarting exchange of information, hindering collaboration, and increasing hostility between the parties (Rahman & Kumaraswamy, 2002, 2004). Moreover, the lack of institutionalized structures needed to enforce the contract may undermine the usefulness of formal contracts and high levels of uncertainty and complexity in practice can make it impossible or excessively expensive to construct 'complete' contracts upfront (Lyons & Mehta, 1997; Tuuli, Rowlinson, & Koh, 2010). Consequently, relational governance mechanisms have been proposed as an effective alternative in such situations (Rahman & Kumaraswamy, 2005).

Scholars adopted different theoretical lenses to explain the significance of contractual and relational governance mechanisms in safeguarding exchange relationships, integrating

exchange interactions, or creating value for exchange partners. As such, IORs governance literature explained how formal contracts and relational mechanisms can be used to guard against common transaction hazards such as behavioral uncertainty, environmental uncertainty, or task uncertainty which could render the transactions ineffective (Eisenhardt, 1985; Heide, 1994; Jap & Anderson, 2003; Luo, Liu, Zhang, & Huang, 2011), or to enhance coordination and facilitate cooperation between parties and mitigate performance risks (Gundlach, Achrol, & Mentzer, 1995; Ring & Van de Ven, 1992), or to facilitate value creation through providing access to knowledge (e.g., J. J. Li, Poppo, & Zhou, 2010; Lui, 2009), creating competitive advantage (e.g., Dyer & Singh, 1998), or promoting long-term orientations within IORs (e.g., Yang, Zhou, & Jiang, 2011).

Apart from discussions about the utility of governance mechanisms, a substantial body of literature investigated the conditions that would affect the choice and effects of these mechanisms (e.g., Jap & Ganesan, 2000; Poppo & Zenger, 2002). While some studies focused on transactional conditions (e.g., asset type, asset specificity, environmental uncertainty, behavioral uncertainty, expected future, buyer lock-in) (e.g., D. Chen, Park, & Newburry, 2009; Rhee, Kim, & Lee, 2014), others examined relational conditions (e.g., prior ties, shared norms, trust) (e.g., Y. Liu, Luo, & Liu, 2009; Zhang, Wan, Jia, & Gu, 2009) or institutional conditions (e.g., informal institutions, formal institutions) (e.g., Yuan Li, Xie, Teo, & Peng, 2010; Zhou & Poppo, 2010). Despite the great strides taken by previous scholars to explain the efficacy of different governance mechanisms under various conditions, the findings are inconsistent. Whilst some studies found contractual and relational governance mechanisms to be complementary (e.g., Poppo & Zenger, 2002), others indicated that they are substitutes

(e.g., L. Wang, Yeung, & Zhang, 2011). Recent research suggest that their complementarity or substitutability is contingent on various transactional or environmental conditions (e.g., Abdi & Aulakh, 2014; Rhee et al., 2014), but these conditions have not been fully understood. Moreover, there are ambiguities in the literature that may impact on consistency of findings, and therefore need more clarification.

First, the definition of relational governance is still ambiguous and there are varied ways of measuring this construct. While some studies referred to prior ties and social embeddeness or pre-existing shared norms and/or trust among partners as relational governance mechanisms (e.g., Y. Chen & Bharadwaj, 2009; Lui & Ngo, 2004; Yu, Liao, & Lin, 2006), others regarded these as contingent factors and antecedents for the choice of contractual and relational governance mechanisms (e.g., Luo, 2002; Wuyts & Geyskens, 2005). Further, some studies considered joint actions and collaborations during exchange relationships as relational governance mechanisms and measured accordingly (e.g., Cannon, Achrol, & Gundlach, 2000; e.g., Hoetker & Mellewigt, 2009). With the measurement of the relational governance construct, some used first-order constructs (e.g., Abdi & Aulakh, 2014; Poppo & Zenger, 2002), while others treated it as a second-order construct (e.g., Arranz & Arroyabe, 2012; Y. Liu et al., 2009). These inconsistencies in the definition and measurement could be the source of inconsistent findings on the interactions between contractual and relational governance mechanisms.

Second, previous studies in project management domain showed that complex processes and various uncertainties in this context should be controlled by project partners and the ability of the partners to apply various types of governance mechanisms will contribute to the

partnership outcomes (Naoum, 2003; Rahman & Kumaraswamy, 2002; Turner & Simister, 2001). In other words, even if the best governance mechanisms are selected, it does not guarantee satisfactory outcomes if the partners lack experience and/or understanding of the mechanisms. However, it is not clear how project control capability of partners interacts with governance mechanisms to impact on project performance.

Third, given the importance of the choice of appropriate governance mechanisms, it is important to know whether the efficacy of contractual and relational governance mechanisms is constant in different cultural and legal contexts. Prior studies referred to the culture and contract enforceability as 'shifting parameters' and suggested that these factors are likely to have a noticeable impact on the efficacy of different governance mechanisms (e.g., Poppo & Zenger, 2002; Yang et al., 2011). Despite the calls for examining the contingent effect of cultural and legal conditions on the choice and effects of governance mechanisms, few empirical studies acknowledged this concern.

1.2 Research purpose

This research aimed to add to the long-lasting debate on the choice and effects of governance mechanisms in regulating exchange relationships in complex transactions. To fulfill this purpose, an extensive review of literature was undertaken and three gaps were identified:

(1) ambiguous definition of relational governance mechanisms and inconsistent findings on the interactions between relational governance and formal contracts in explaining exchange performance;

(2) how project control capability of partners interacts with governance mechanisms and jointly impacts on exchange performance;

(3) how culture and contract enforceability can influence the choice and effects of governance mechanisms in explaining exchange performance.

To address the first gap, this study differentiates between ex-ante and ex-post relational governance mechanisms. One of the main criteria for conceptualizing and measuring relational governance mechanisms can be the nature of the mechanisms. As such, differentiating between the social bonds, norms and trust developed prior to the collaboration, and information exchange, joint actions and social exchanges that take place during the new exchange relationships can be helpful. Drawing upon social capital theory and social exchange theory, this thesis conceptualizes social capital (e.g., prior ties, shared norms, and trust) as ex-ante relational governance mechanism, and collaboration (e.g., information exchange, joint actions) as ex-post relational governance mechanism to investigate the joint effects of the two on exchange performance.

Addressing the second gap, this study borrows from control theory to conceptualize 'project control capability' as a new construct. I submit that to achieve the expected results from exercising governance mechanisms, the project partners must have enough 'project control capability' and this capability can be improved by the use of governance mechanisms. In other words, 'project control capability' plays a mediating role in the relationship between

governance mechanisms and performance, that is, even though governance mechanisms have been appropriately selected, if they cannot enhance the partners' 'project control capability', they will lose their efficacy.

Finally, this study adopts institutional view to examine the contingent effect of culture as informal institution and the legal system as formal institution on the choice and effects of governance mechanisms. According to the institutional theory, established formal and informal institutions can constrain human behavior and structure inter-personal and inter-organizational behavior by increasing the actors' costs in various ways, including economic costs (e.g., increasing risk), cognitive cost (e.g., requiring more thought), and social cost (e.g., reducing legitimacy) (Y. Li et al., 2010; North, 1990; M. W. Peng, Sun, Pinkham, & Chen, 2009; Phillips, Lawrence, & Hardy, 2004). Thus, individualism/collectivism and contract enforceability were selected as representative dimensions of culture and legal system, respectively, to examine their impact on the choice and effects of governance mechanisms.

1.3 Research questions

According to the identified gaps in the literature, the following research questions are recommended:

1. By conceptualizing the prior ties, shared norms, and trust as ex-ante relational governance while collaboration as ex-post relational governance, what are the joint effects of the two on performance?

2. How does 'project control capability' interact with governance mechanisms to impact on performance?
3. How do the culture and the contract enforceability impact the choice and effects of governance mechanisms?

1.4 Research design

To answer the research questions and test the research hypotheses, cross-cultural questionnaire survey was conducted. Since one of the objectives of this research was to examine the impact of individualistic/collectivistic cultures and contract enforceability on the choice and effects of governance mechanisms, this study analyzed the contributions made by various governance mechanisms on exchange performance in two culturally and legally diverse environments; Iran and Australia.

Since this study set out to analyze the choice and effects of governance mechanisms in regulating client-contractor relationships in large construction projects, the client-contractor relationships embedded in projects were chosen as the units of analysis. In this study large construction projects were treated as sets of transactions (Pryke & Pearson, 2006) to identify the effects of governance mechanisms on project performance. To collect data executive/project managers working in large construction contractors were surveyed. From 365 and 241 questionnaires sent to Iranian and Australian companies, 84 and 41 were received in valid and complete form. After removing questionnaires that contained outliers, 73 Iranian and 38 Australian client-contractor partnerships were then analyzed using partial least square

structural equation modeling (PLS-SEM) method to test the research hypotheses and validate the research model.

1.5 Research findings and contributions

The main purpose of this study was to develop the IORs literature on the choice and effects of governance mechanisms in the project context. The findings of this study make multiple contributions to the IORs governance and project management literature. First, drawing on social capital and social exchange theories, this study differentiated between social capital (e.g., prior ties, shared norms, and trust) as ex-ante relational governance and collaboration (e.g., information exchange, joint actions) as ex-post-relational governance and investigated the distinct roles of these relational mechanisms in regulating exchange relationships. The results confirmed that social capital and collaboration act differently in their interactions with formal contract and also in explaining project performance. For example, the research results showed that while social capital and formal contract have no substitutive or complementary relationship, the relationship between collaboration and formal contract is complementary.

Second, borrowing from inter-organizational control theory, 'project control capability' was defined as a new construct to examine the mediating effect of control capability of the project partners on the efficacy of governance mechanisms in explaining project performance. The research findings confirmed the importance of project control capability in successful exercise of governance mechanisms. For example, the results showed that project control

capability mediates the relationship between collaboration and project (time&cost) performance and relationship satisfaction in different contexts.

Third, this study grounded its theoretical framing on Williamson (2000)'s social system model to examine the contingent effect of individualistic/collectivistic culture and high/low contract enforceability on the efficacy of governance mechanisms in regulating exchange relationships in different contexts. The results contribute to IORs governance literature and support Williamson (2000)'s assertion that the institutional environment—formal and informal institutions—impacts the comparative effectiveness of governance mechanisms. The findings showed that in collectivistic cultures with low contract enforceability social capital is a key enabler of project (time&cost) performance and relationship satisfaction and effective collaboration impacts indirectly on relationship satisfaction enabled by 'project control capability'. In contrast, in individualistic cultures with high contract enforceability effective collaboration enabled by 'project control capability' has a pivotal role in the relationship between social capital, formal contract, and project (time&cost) performance. It was also found that in this context working with trusted partners motivates collaboration which in turn leads to relationship satisfaction and also formal contract impacts indirectly on relationship satisfaction through collaboration. Finally, the results indicated that project (time&cost) performance is an important contributor to relationship satisfaction in both contexts.

1.6 Outline of Chapters

Chapter 2 reviews the concept of governance and its application in IORs and provides an overview of prior studies on the choice and effects of governance mechanisms and their interactions to identify the gaps in the literature and develop the research questions. To address these questions, Chapter 3 develops research hypotheses and a theoretical framework, and in Chapter 4, research design for implementing the study is explained. Chapter 5 describes the data analysis process, followed by Chapter 6 that presents the research results and discusses the findings. Finally, the main findings of this thesis are summarized, conclusions are drawn and theoretical and practical implications are presented in Chapter 7, along with the research limitations and avenues for future work.

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CHAPTER TWO: LITERATURE REVIEW

- ***Introduction***
- ***Governance definition***
- ***Governance of inter-organizational relationships (IORs)***
- ***IORs governance mechanisms***
- ***The choice and effects of governance mechanisms***
- ***Gaps in the literature***
- ***Chapter summary***

2.1 Introduction

This chapter contains the relevant literature on the contractual and relational governance mechanisms and their theoretical background, as well as a review of findings from major empirical studies on the choice and effects of governance mechanisms and their interactions under different transactional and contextual conditions. From this review, three gaps in the literature are highlighted and discussed, from which a research agenda is proposed and the research questions, theoretical framework, and research hypotheses are developed.

2.2 Governance definition

The term 'governance' originates from the Greek word 'kubernan' or Latin word 'gubernare', meaning 'to steer' (Muller, 2009; Renz, 2007). The Oxford dictionary defines 'governance' as the "action or manner of governing a state, organization, etc", where 'to govern' is described as "to conduct the policy, actions, and affairs of (a state, organization, or people) with authority", and "to control, influence, or regulate (a person, action, or course of events)". As the definition shows, 'direction and control' and 'checks and balances' are the main concerns of governance arrangements (Renz, 2007). In other words, governance arrangements provide a framework through which not only ownership and control of tasks become clearly distinguished, but also the boundaries for management actions are specifically defined (Muller, 2009). As defined by the United Nations Economic and Social Commission for Asia and the Pacific (UN-ESCAP), governance is the process of decision making and the process by which decisions are implemented. According to UN-ESCAP, there are eight main

characteristics of good governance including participation, rule of law, transparency, responsiveness, consensus oriented, equity and inclusiveness, effectiveness and efficiency, and accountability (Abednego & Ogunlana, 2006).

While the governance terminology was originally applied to describe the government of countries, its meaning and application have expanded through various domains during the past decades, such that nowadays governance is ultimately concerned with creating the conditions for ordered rule and collective actions, not only at government level, but also within organizational and inter-organizational contexts (Muller, 2009; Stoker, 1998). Since the focus of this research is to study the role of governance mechanisms in client-contractor relationships, the literature on inter-organizational relationships (IORs) governance is reviewed in the following section.

2.3 Governance of inter-organizational relationships (IORs)

Although traditional form of conducting a business was through either discrete market transactions—where faceless buyers and sellers exchanged standardized goods or services at a competitive price—or internal hierarchical arrangements—where highly specific structures were tailored to the special needs of the transactions—a growing number of firms over the past decades have been using various new forms of IORs (e.g., strategic alliances, partnerships, coalitions, joint ventures, franchises, research consortia) as hybrid forms of governance structures which fall on a continuum between market and hierarchy (Ring & Van de Ven, 1994; Williamson, 1979). Since then, the performance of IORs governance

mechanisms has become one of the main success factors for business firms (Palmatier, Dant, & Grewal, 2007), and consequently, the subject of research for academics (Ruuska, Ahola, Artto, Locatelli, & Mancini, 2011).

According to the IORs literature, inter-organizational exchanges are subject to two main issues: safeguarding and integration (Gulati, Lawrence, & Puranam, 2005; Hoetker & Mellewigt, 2009; Jones, Hesterly, & Borgatti, 1997). Safeguarding means mitigating opportunistic behavior of engaged parties in an exchange relationship, whereas, integration concerns about integrating dispersed activities and resources as well as aligning sometimes contradictory interests and goals which are critical to the successful implementation of a project (Hoetker & Mellewigt, 2009). Thus, IORs governance mechanisms can be used to guard against common transaction hazards such as behavioral uncertainty, environmental uncertainty, or task uncertainty which could render the transactions ineffective (Eisenhardt, 1985; Heide, 1994; Jap & Anderson, 2003; Luo et al., 2011), or to enhance coordination and facilitate cooperation between parties and mitigate performance risks (Gundlach et al., 1995; Ring & Van de Ven, 1992).

Recently, IORs governance literature has referred to value creation as another concern that must be addressed by governance design. In this context, scholars would consider the role of governance mechanisms in accessing/acquiring knowledge (e.g., J. J. Li et al., 2010; Lui, 2009), creating competitive advantage (e.g., Dyer & Singh, 1998), or promoting long-term orientations within IORs (e.g., Yang et al., 2011).

Due to the complex forms of IORs in terms of inter-firm exchanges (e.g. engineering, procurement, finance, construction, and operation) in construction projects, and also the

fragmented nature of these projects that causes problems with communication and coordination, client-contractor relationships have also been subjected to the same governance problems (W. T. Chen & Chen, 2007) that have been regarded as the main causes of project failure (Ling et al., 2013; Ng et al., 2002). Subsequently, various governance mechanisms have been introduced as solutions, and they are described in the following section.

2.4 IORs governance mechanisms

Literature on IORs governance generally categorizes governance mechanisms into two types—contractual and relational governance mechanisms—that are being defined in the following sections.

2.4.1 Contractual governance mechanisms

Detailed formal contracting is regarded as one of the regular solutions for addressing IORs governance concerns (Roehrich & Lewis, 2010). Contractual governance mechanisms, also referred to as formal governance, formal control, formal contract, explicit contract, hard contract, and written contract, focus mostly on the formal and prescribed part of control and utilize more tangible instruments to regulate the IORs. As mentioned in the previous section, IORs governance literature has identified a variety of functions (e.g., safeguarding, integration, and value creation) for each type of governance mechanisms, each of which was established on various theoretical grounds that will be analyzed in this section.

2.4.1.1 Safeguarding approach

In this approach, control is the main function of formal contract. Such perspective assumes control as "a mode of organizing transactions" (Williamson, 1979) or "a mechanism of structuring and regulating the conduct of parties in an exchange" (Mohr, Fisher, & Nevin, 1996) to safeguard their interests (Luo et al., 2011) against market hazards such as partner opportunism, market uncertainty, goal heterogeneity, site conditions, and contractual incompleteness (Eisenhardt, 1985; Heide, 1994; Jap & Anderson, 2003; Luo et al., 2011). Transaction cost economics (TCE), agency theory, and control theory are three underlying theories for explaining this perspective. TCE relies on two behavioral assumptions—bounded rationality and opportunism. Further, TCE's basic unit of analysis is transaction which has three key attributes: asset specificity (the type and degree of specificity of different assets in the transactions), uncertainty (the level of environmental and behavioral uncertainties the transactions are associated with), and frequency (the chance of frequent transactions in the future) (Williamson, 1991). Based on TCE, formal contracts with sufficient elaboration and detailedness can serve as a mechanism for controlling the problems of adaptation, performance, and safeguarding caused by uncertainty, bounded rationality, and the risk of opportunistic behavior (Arranz & Arroyabe, 2012; Ferguson, Paulin, & Bergeron, 2005; Williamson, 1985). That is, explicitly stating how various situations will be handled and how disputes will be resolved will reduce the relational risk in the project (Tarun K Das & Teng, 1998; Mellewigt, Madhok, & Weibel, 2007).

On the other hand, agency theory characterizes these exchanges as relationships between principals and agents, where agents perform some tasks on behalf of the principals

(Bergen, Dutta, & Walker Jr, 1992). In addition to considering bounded rationality and opportunism in TCE, the agency perspective accepts another human assumption of risk aversion that arises when principal and agent have different attitudes towards risk. It is also assumed that exchange parties have goal incongruence and there is information asymmetry between them. Furthermore, agency theory sees information as a commodity that is purchasable. According to these assumptions, agency theory contends that each principal-agent relationship is subject to the problems of moral hazard, adverse selection, and risk sharing that should be addressed by including efficient incentives and rules in the contract (Eisenhardt, 1989).

Another theory that has been used to explain safeguarding problems in the IORs context is control theory, where the main question is to decide whether the contracting orientation will be: (1) a behavior-oriented contract, or (2) an outcome-oriented contract (Eisenhardt, 1989; Ouchi, 1979). While the focus of behavior-oriented contract is to regulate people's behavior by specifying and enforcing desired behaviors and processes, outcome-oriented contract puts the emphasis on outcomes by setting output targets, measuring and evaluating outputs, and rewarding/penalizing the people who are in charge (Aulakh & Gencturk, 2000; Badenfelt, 2010; D. Chen et al., 2009; Tuuli et al., 2010).

2.4.1.2 Integration approach

The second view considers formal arrangements not only as mechanisms for enforcing negotiated agreements and alleviating conflicts, but also as facilitating tools for improving coordination and cooperation among exchange parties (Gulati et al., 2005; Hoetker &

Mellewigt, 2009; L. Li & Ng, 2002; Lumineau & Malhotra, 2011; Reuer & Ariño, 2007). Despite the fact that coordination and cooperation have been used interchangeably in IORs literature, they reflect two different concerns about integration in collaborative exchanges. While the former refers to the problem of the alignment of actions among exchange parties, the latter addresses the alignment of interests (Gulati et al., 2005).

Regarding coordination concern, the TCE perspective contends that exchanges with high idiosyncratic (specific) assets or complex tasks raise coordination concerns that should be addressed by applying appropriate governance mechanisms (Luo, 2002). Additionally, ambiguous environments exacerbate coordination problems due to the possibility of different interpretations about desired actions under different conditions which may dampen integrated responses to changed circumstances (Carson, Madhok, & Wu, 2006; Lawrence & Lorsch, 1967).

Resource-based view (RBV) posits that coordinating the resources in the IORs context is a necessary condition for pooling the resources and realizing the values associated with IORs (Mellewigt et al., 2007). Advocates of the coordination approach posit that specified rights and obligations of both parties as well as defined procedures and guidelines provided by the formal contracts can clarify the scope of actions, facilitate interactions, and pave the ways for negotiations, that will ultimately improve coordination among partners (Carson et al., 2006; Jap & Ganesan, 2000; Mayer & Argyres, 2004; Poppo & Zenger, 2002). Contracts also reduce the monitoring and coordination costs of transactions by providing clear statements about the roles and responsibilities of exchange parties and by defining the monitoring process (Lui & Ngo, 2004; Reuer & Ariño, 2002).

As discussed above, the other aspect of concerns about integration within IORs refers to cooperation between exchange partners arising from conflicts of interests. Such a perspective considers that cooperation or mutual collaboration between parties in allocating and exploiting resources is necessary to maximize joint benefits in recurring exchanges under uncertain conditions (Dyer & Singh, 1998; Luo et al., 2011; Poppo & Zenger, 2002; Song, Di Benedetto, & Zhao, 2008). Stakeholder theory is primarily utilized to explain the influence of formalization in promoting coordination in IORs. Based on stakeholder theory, the main threat to inter-firm exchanges is the imbalance of interests between stakeholders that may affect their cooperation, and which may damage the exchange performance (Clarke, 1998; Donaldson & Preston, 1995). Accordingly, formalization can enhance cooperation between project stakeholders by aligning their objectives and interests (Barringer & Harrison, 2000). Similarly, trust perspective examines the role of trust in promoting coordination and cooperation in IORs and argues that formal arrangements fulfill this purpose by increasing transparency in the exchange relationships and modifying the perceptions of the partners about the situation (Tarun K Das & Teng, 1998; Lui & Ngo, 2004; Mellewigt et al., 2007).

2.4.1.3 Value creation approach

Unlike previous approaches that reflect operational concerns regarding IORs and attempt to improve the exchange efficiency by applying the most appropriate governance mechanisms, the value creation approach primarily focuses on the strategic advantages of IORs and examines the effectiveness of alternative combinations of governance mechanisms. Based on this perspective, a good governance system should not only provide safeguards to

exchanges and promote integration among partners during a current relationship it should also contribute to the partners' strategic goals. Accordingly, value creation is the main motivation for the choice of governance mechanisms, which is why researchers have referred to the variety of benefits associated with inter-firm exchanges, such as learning, commitment, or pooling of resources (e.g., Arranz & Arroyabe, 2012; C. Chen, Zhu, Ao, & Cai, 2013; J. J. Li et al., 2010; Lui, 2009; Lui & Ngo, 2004; Yang et al., 2011) and argued about how different governance mechanisms will achieve the expected values. The resource-based view and inter-organizational learning theory are the most popular theories for describing this perspective. Drawing upon resource-based view, some studies referred to IORs as carriers for accessing valuable resources (Mellewigt et al., 2007). For example, Dyer and Singh (1998) argued that IORs can be an excellent source for organizations to develop their competitive advantage by collaborating on relationship-specific assets, knowledge-sharing routines, or complementary resources/capabilities. In this perspective, resources are categorized into two general types of property-based (tangible) and knowledge-based (intangible) resources (Tushar K Das & Teng, 2000). Through the lens of a resource-based view, previous studies found that formal contract is a useful apparatus for exchanges where property-based resources are more dominant (D. Chen et al., 2009; Hoetker & Mellewigt, 2009).

By differentiating knowledge access and knowledge acquisition, relationship learning theory posits that formal contracts are suitable mechanisms for knowledge acquisition (e.g., Lui, 2009), whereas some studies within relationship learning found that contractual governance mechanisms can help transfer explicit knowledge by specifying formal operating procedures and codifying performance metrics (e.g., J. J. Li et al., 2010).

Table 2-1 shows a summary of theoretical perspectives towards contractual governance mechanisms. Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms are also presented in Appendix A.

Table 2-1 : Theoretical perspectives towards contractual governance mechanisms

Performance domain	Description	Representative theory
Safeguarding	• Reduces behavioral uncertainty and incongruence through providing binding rules and procedures, and crystallizing partners' expectations about project scope and objectives; • Decreases environmental uncertainty by stating how unexpected future events will be handled and how disputes will be resolved; • Protects the relationship against opportunistic behavior by establishing sanctions for breach of contract.	• Transaction cost economics (TCE) • Agency theory • Control theory
Integration	• Enhances cooperative and collaborative atmosphere in the project environment by aligning partners' objectives and interests; • Promotes coordination among project partners by clarifying the rights and responsibilities of both parties and providing appropriate linkages between two different and interdependent task units; • Facilitates coordination by increasing the predictability of each party's actions and structuring communication channels; • Reduces monitoring cost by improving the relationship's transparency and specifying monitoring objects.	• TCE • Resource-based view • Stakeholder theory • Theory of trust
Value creation	• Contributes to the transfer of explicit knowledge among partners, and consequently, increases partners' competencies and provides more value for project parties; • Facilitates knowledge exchange and collaborative innovation by reducing the associated costs and risks through providing conflict resolution provisions.	• Resource-based view • Inter-organizational learning theory

2.4.2 Relational governance mechanisms

Despite the positive aspects of formal contracting discussed above, a reliance on formal contracting could lead to adversarial relationships between the contracting parties when both sides delve into the legalistic aspects (Sitkin & Roth, 1993). Studies have found that adversarial relationships often cause project failures (Ling et al., 2013; Ng et al., 2002). Relational governance can be an alternative governance choice to formal contracting by providing more flexibility and mitigating unexpected disturbances throughout the project (Yang et al., 2011). Relational governance mechanisms are also referred to as social governance, relational control, social control, informal control, informal contracts, or social embeddedness, and primarily focus on deploying informal means to regulate the IORs. As with contractual governance, the literature on relational governance mechanisms applied different theoretical lenses to explain different functions of relational mechanisms, such as: (1) safeguarding, (2) integration, and (3) value creation.

2.4.2.1 Safeguarding approach

This approach refers to relational governance mechanisms as informal arrangements for safeguarding exchange parties against exchange hazards (e.g., bounded rationality, opportunism, behavioral uncertainty, environmental uncertainty). Relational contracting, theory of trust, social network theory, institutional theory and control theory have been cited by previous studies as underlying theories for this perspective. Unlike TCE which has a 'uni-time' view towards agreement between exchange partners by assuming the original agreement

as the reference point for adaptation, relational contracting theory assumes that the contract has expanded through the entire relationship phase (Ferguson et al., 2005; Macneil, 1978), that is, exchanges and adaptations take place from the beginning to the end of a relationship through the exchange of relational norms (Macneil, 1980). Relational contracting theory argues that working together through long term interactions and deploying different social means may help partners to create a shared culture and shared norms, and subsequently, to reduce the goal and preference incongruence while increasing commitment, mutuality, solidarity and flexibility (Kohtamäki, Vesalainen, Varamäki, & Vuorinen, 2006; Patzelt & Shepherd, 2008; Poppo, Zhou, & Zenger, 2008; E. T. Wang & Wei, 2007). As noted by Jap and Ganesan (2000), relational bonds can promote solidarity that shifts the partners' views from self-centered behavior to 'we-ness' feeling. Exchanging information, on the other hand, reduces asymmetries through communication that leads to harmonizing the conflict and honesty in the project. Additionally, by reducing the rigidity of formal contracts, relational mechanisms provide more flexibility in adapting to environmental uncertainty (Ferguson et al., 2005).

By extending the reasoning for the safeguarding function of relational mechanisms, the theory of trust examines the impact of various forms of trust on mitigating opportunism and reducing uncertainty in IORs. The literature has identified three general forms of trust, including competence trust, calculative trust, and benevolent trust (Doney & Cannon, 1997; Lui & Ngo, 2004; Yu et al., 2006). Competence trust is primarily based on the shared confidence among partners about each other's capabilities to fulfill their roles and is usually measured by estimating the partner's resources and reputation. Shared competence trust

among exchange partners can mitigate the performance risk (Lui & Ngo, 2004). On the other hand, calculative trust is more rational and is primarily affected by the chance of future collaborations among partners (Yu et al., 2006). In this sense, calculative trust can remove incentives for opportunistic behavior by promising future work and introducing sanctions in the form of the loss of future business (Carson et al., 2006; Heide & Miner, 1992). Finally, goodwill (benevolent) trust refers to the degree to which one party is confident that the other party will not behave opportunistically in an uncertain condition (Tarun K Das & Teng, 1998; Nooteboom, Berger, & Noorderhaven, 1997; Ring & Van de Ven, 1994; Yang et al., 2011). As the duration of successful relationships increases, the benevolent trust becomes greater and deeper between partners, and as a result, the chance of opportunistic behavior will decrease (Dyer & Chu, 2000; Yu et al., 2006).

Based on social network theory, the structure and the quality of the social relations between partners can affect their economic actions (Granovetter, 1985; Uzzi, 1997). For example, Uzzi (1997) showed that social embeddedness—historical and structural embeddedness of social relations—can reduce behavioral and environmental uncertainties and safeguard the IORs against opportunism. Similarly, Mike W Peng and Heath (1996) found that social interactions play a significant role in alleviating uncertainties in emerging economies such as China.

In the same way, institutional theory assumes that recurrent interactions between organizations leads to institutionalized norms that are no longer based on individuals, but are embedded at the organizational level. When IORs reach this level of institutionalization, the shared norms act as control mechanisms by increasing the costs of opportunistic behavior.

These deviation costs may be exercised in different ways including economic costs (increasing risk), cognitive costs (requiring more thought), or social costs (reducing legitimacy)(Y. Li et al., 2010; Mike, Sunny, Brian, & Hao, 2009).

Finally, control theory defines clan control as a social mechanism which is based on congruent goals and shared norms between partners (Ouchi, 1979, 1980). When the level of agreement between partners is wide and deep, clan control can be exercised, because the clan type relationship between partners can exert proper behavior through tradition, implicit knowledge, and embedded work processes that guarantee a high level of commitment to those socially prescribed behaviors (Kirsch, Ko, & Haney, 2010; Ouchi, 1979, 1980). Clan control can motivate the desired behavior by rewarding those members whose behavior is consistent with group expectations, norms, and values (Fortado, 1994), and also restrain deviations from accepted codes of conducts by sanctioning the offenders (Westphal & Khanna, 2003).

2.4.2.2 Integration approach

As discussed before, this approach focuses primarily on coordination and cooperation concerns in exchange relationships. Relational contracting theory, theory of trust, social network theory, social exchange theory, and control theory are the underlying theories used to explain the integrative role of relational governance mechanisms. For example, relational contracting theory posits that the development of relational norms such as solidarity, participation, and information exchange may provide the parties with a degree of confidence through which coordination will be facilitated and a cooperative atmosphere will be enhanced (Hatten, James, Fink, & Keeler, 2012; Macneil, 1978). Similarly, the trust perspective holds

that trustful relationships facilitate joint actions (Claro, Hagelaar, & Omta, 2003) by ensuring the partners about capabilities of the exchange partner (competence trust) and its goodwill (benevolent trust). By adopting the lens of social network theory, Sohn (1994) contended that embedded social knowledge enhances coordination between exchange parties by making the partner's behavior both foreseeable and understandable, while control theory posits that when clan culture is developed through socialization and recurrent interaction, it would lead to shared values and shared objectives which would consequently promote coordination and cooperation among partners (Kirsch et al., 2010; Ouchi, 1979). However, social exchange theory views partner's behavior in terms of exchanges of resources and claims that a lack of resources encourages parties to engage with each other to obtain valuable inputs (Tushar K Das & Teng, 2002). Social exchange theorists argue that the formation and continuation of social exchanges based on reciprocated behavior may promote commitment between exchange parties, and thereby facilitate integration and increase the probability of future collaboration (Young-Ybarra & Wiersema, 1999; Yu et al., 2006).

2.4.2.3 Value creation approach

As mentioned before, in this approach the ultimate goal of arranging an IORs governance system is to create more value for exchange partners. The resource-based view, inter-organizational learning theory, and social capital theory are the primary theories that can be used to explain the role of relational governance mechanisms in the value creation process. The resource-based view posits that relational mechanisms can increase the capability of exchange partners by providing unique opportunities for sharing resources and inter-

organizational learning (J. J. Li et al., 2010). According to past empirical studies, relational governance mechanisms are the primary mechanisms that were used to exploit knowledge-based resources (D. Chen et al., 2009; Hoetker & Mellewigt, 2009). Based on inter-organizational learning theory, relational governance mechanisms can facilitate the transfer of tacit knowledge and know-how by strengthening the social bonds and enhancing the level of interactions between partners (J. J. Li et al., 2010). On the other hand, social capital theory considers shared norms and trust as forms of capital which are embedded within IORs through recurrent interactions. Based on this assumption, social capital theory posits that social embeddedness which is the product of a long history of collaborations between partners provides a fertile ground for more investment, and thereby contributes to the value creation process (Adler & Kwon, 2002). For instance, Yu et al. (2006) argues that the existence of trust in IORs helps stabilizing a partnership and ensuring that the partners will form committed relationships.

Table 2-2 summarizes the theoretical perspectives of relational governance mechanisms. Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms are also presented in Appendix A.

Table 2-2 : Theoretical perspectives towards relational governance mechanisms

Performance domain	Description	Representative theory
Safeguarding	• Reduces goal and preference incongruence by creating shared culture and shared norms and increasing commitment, mutuality, solidarity and flexibility; • Provides more flexibility in controlling environmental uncertainty by reducing the rigidity of formal contracts; • Enhances competence trust among exchange partners that mitigates the performance risk; • Promotes calculative trust by raising the expectations about future works that removes incentives for opportunistic behavior; • Boosts benevolent trust, and as a result, decreases the chance of opportunistic behavior; • Fortifies social embeddeness and institutionalizes the norms of behavior in a clan-type relationship through recurrent interactions which can reduce behavioral and environmental uncertainties and safeguard the IORs against opportunism.	• Relational contracting theory • Theory of trust • Social network theory • Institutional theory • Control theory
Integration	• Provides the parties with a degree of confidence through which the cooperative atmosphere will be enhanced; • Facilitates joint actions by ensuring the partners about capabilities of the exchange partner and its goodwill; • Enhances coordination between exchange parties by making the partner's behavior more foreseeable and understandable; • Creates clan culture (e.g., shared values, shared objectives) through socializations and recurrent interactions which promotes coordination and cooperation among partners; • Facilitates social exchanges based on reciprocal arrangements which leads to higher levels of commitment and more integrative relationships.	• Relational contracting theory • Theory of trust • Social network theory • Social exchange theory • Control theory
Value creation	• Expedites capability development of exchange partners by providing unique opportunities for resource sharing and inter-organizational learning; • Facilitates the transfer of tacit knowledge and know-how by strengthening the social bonds and enhancing the level of interactions between partners; • Facilitates the exploitation of knowledge-based resources by providing the opportunities for open discussions and open information exchange and spreading the common language; • Accelerates the partnership stabilization process by providing a trustful atmosphere.	• Resource-based view • Inter-organizational learning theory • Social capital theory

2.5 The choice and effects of governance mechanisms

Given the definition of contractual and relational governance mechanisms and their associated theoretical perspectives, this section reviews the literature on the choice and effects of these governance mechanisms and their interactions under different transactional and contextual conditions to identify the gaps in the literature and specify the scope of this research.

The choice and effects of contractual and relational governance mechanisms and their interactions have been the focus of a substantial body of literature but the findings are inconsistent. Whilst some studies found these two types of mechanisms to be complementary (e.g., Poppo & Zenger, 2002), others indicated that they are substitutes (e.g., L. Wang et al., 2011). However, recent research suggest that their complementarity or substitutability is contingent on various transactional or environmental conditions (e.g., Abdi & Aulakh, 2014; Rhee et al., 2014). A summary of the findings of the major empirical studies are presented in Table 2-3.

It is worthwhile noting that the conditions under which the interactions between governance mechanisms have been studied can be categorized into three main groups: (1) transactional conditions (e.g., asset type, asset specificity, environmental uncertainty, behavioral uncertainty, expected future, buyer lock-in), (2) relational conditions (e.g., prior ties, shared norms, trust), and (3) institutional conditions (e.g., informal institutions, formal institutions).

The first group includes conditions that are characterized by the types of transactions that take place in an exchange relationship. As described in the previous section, RBV assumes that the asset type (e.g., knowledge-based assets, property-based assets) is a strong predictor of the efficacy of governance mechanisms (D. Chen et al., 2009). It was also discussed that from TCE perspective, transactional factors such as asset specificity, uncertainty, and expected future (frequency) are the main antecedents for the choice of governance mechanisms. Further, TCE assumes that buyer lock-in—the difficulty that a buyer faces in replacing the supplier—affects the transaction performance by increasing the switching costs for the buyer and enhancing the chances for supplier's opportunistic behavior (Rhee et al., 2014; Williamson, 1985).

The second group describes the characteristics of the relationships between exchange partners including the history of relationships between partners, the extent to which they share goals and values, and the level of trust between them. These factors have been suggested by sociologists as complementary conditions to transactional conditions and are assumed to have an impact on the choice of governance mechanisms (Granovetter, 1985; Y. Liu et al., 2009; Zhang et al., 2009).

Finally, the institutional group is concerned about the role of informal institutions—the culture of the society—and formal institutions—the legal system—on the efficacy of different governance mechanisms (Williamson, 2000).

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
1	Cannon et al. (2000)	US	Buyer-supplier	Not specified	Legal bonds	Cooperative norms	Low uncertainty (environmental and task): Cooperative norms are redundant.	High uncertainty (environmental and task): Cooperative norms moderate the impact of formal contract on performance
2	Jap and Ganesan (2000)	US	Retailer-supplier	Chemical products	Explicit contract	Relational norms: Information exchange; Solidarity; Participation	- Exploration phase: Supplier's TSIs substitute explicit contract and relational norms. - Maturity phase: Relational norms are redundant.	- Build-up phase: Relational norms moderate the impact of TSIs and explicit contracts on performance. - Decay phase: Both explicit contracts and relational norms are necessary.
3	Poppo and Zenger (2002)	US	Buyer-supplier	Not specified	Contractual complexity	Relational governance	-	- In early years of relationships: Focus is on formal contracts. - At the maturity phase: Focus is on relational governance. - High uncertainty (environmental): Focus is on relational governance. - High asset specificity: Focus is on formal contracts.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
4	Luo (2002)	China	IJV members	Wide range of equity manufacturing joint ventures	Contract: Term specificity; Contingency adaptability	Cooperation	-	- Long history of cooperation: The focus will be on contingency adaptability. - High contingency adaptability: Cooperation will be increased. - High term specificity and contingency adaptability: The impact of cooperation on performance will be increased
5	Lui and Ngo (2004)	Hong Kong	Architect-contractor	Construction	Contractual safeguards	Trust: Goodwill trust; Competence trust	- High goodwill trust: Detailed contractual safeguards are redundant. - Detailed contract: Goodwill trust is redundant.	- High competence trust: Greater contractual safeguards are needed. - Detailed contract: Focus must be on competence trust.
6	Wuyts and Geyskens (2005)	Netherlands	Buyer-supplier	Machinery and computer equipment; Electronic and electrical equipment	Detailed Contract	Close partner selection	- Long history of relationships: The impact of detailed contract on controlling opportunistic behavior will be decreased.	- Short history of relationships: The impact of detailed contract on controlling opportunistic behavior will be enhanced. - Very high levels of closeness increase the chance of opportunistic behavior.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
7	Ferguson et al. (2005)	US, Canada, Mexico	Client-account manager	Commercial	Contractual governance	Relational governance	-	In established exchanges: Focus is on relational governance.
8	Lee and Cavusgil (2006)	US	Alliance members	Not specified	Contractual-based governance	Relational-based governance	- In terms of strengthening the alliance: Contractual governance has negative effect. - In terms of stabilizing the alliance: Contractual governance is redundant. - In terms of knowledge transfer: Contractual governance has negative effect.	- In initial stages of alliance formation: Focus is on relational governance.
9	Yu et al. (2006)	China, Taiwan	Buyer-supplier	Wide range of industries	Formal governance	Trust: Calculative trust; Benevolent trust (Assist-giving routines and Length of relationships)	- High calculative trust: Reliance on formal governance is decreased.	- Low benevolent trust in terms of history of relationships: Focus is on formal governance.
10	Carson et al. (2006)	US	R&D Client-sponsor	Wide range of industries	Fixed price contract; Negotiable price contract	Reputation; Continuity; Trust; History of relationships	- Low volatility (environmental uncertainty) and low ambiguity (perception of environmental uncertainty): Either mechanism is usable.	- High volatility: Focus is on relational contracting. - High ambiguity: Focus is on Formal contracts.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
11	Mellewigt et al. (2007)	Germany	Company-HR vendor	Not specified	Contractual complexity	Trust	Low trust: Contractual complexity plays dual roles of control and coordination.	High trust: Contractual complexity plays coordination role.
12	Y. Chen and Bharadwaj (2009)	US	Client-vendor	IT	Monitoring; Property rights protection; Dispute resolution; Contingency; Contract extensiveness	Prior interactions	-	High level of past interactions: Except property rights provisions, other parts of contracts become more detailed.
13	Şengün and Wasti (2009)	Turkey	Pharmacy-drug wholesaler	Medical	Output control	Trust; Social control	- High trust: Output control is destructive. - High social control: Output control is destructive.	- Trust moderates the negative impact of output control on performance. - Trust enhances social control.
14	Lui (2009)	Hong Kong	Buyer-supplier	Toy trading	Formal contract	Competence trust; History or relationships; Expected future	-	- Knowledge accessing: Focus is on competence trust. - Knowledge acquisition: Focus is on formal contract. - Long history: The impact of formal control and competence trust on knowledge acquisition is increased. - Long history: While the impact of competence trust on knowledge accessing is increased, the impact of formal control is decreased. - Short expected future: The impact of competence trust on knowledge accessing is increased.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
15	Zhang et al. (2009)	China	PPP members	Medical	Formal contract	Informal contract; Shared values; Prior ties	-	- Prior ties and shared values enhance informal contract. - Long history and high level of shared values: Focus is on informal contracts. - Formal contracts are more useful for achieving explicit outcomes (direct effects) - Informal contracts are more useful for achieving implicit outcomes (knowledge creation and social effects)
16	Hoetker and Mellewigt (2009)	Germany	Alliance members	Telecom	Formal governance	Relational governance	-	- Knowledge-based assets are prevalent: Focus is on relational governance. - Property-based assets are prevalent: Focus is on formal governance.
17	D. Chen et al. (2009)	China	Parent organizations -IJV	Wide range of industries	Formal control: Output control; Process control	Social control	-	- Knowledge-based resources: Focus is on process control and social control. - Property-based resources: Focus is on output control and process control.
18	Y. Liu et al. (2009)	China	Manufacturer -distributer	Household appliance	Transactional mechanisms: Contract; Transaction-specific investment	Relational mechanisms: relational norms; trust	-	- Opportunism is the main concern: Focus is on transactional governance mechanisms. - Relationship performance is the main concern: Focus is on relational governance mechanisms.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
19	Zhou and Poppo (2010)	China	Buyer-supplier	Wide range of industries	Explicit contracts	Relational reliability		- Strong perception of legal enforceability: Focus is on explicit contracts. - Weak perception of legal enforceability: Focus is on relational reliability.
20	J. J. Li et al. (2010)	China	Local firm-foreign subsidiary	Not specified	Formal contract	Relational mechanisms: Brokered access; Shared goals; Trust		- For acquiring tacit knowledge: Focus is on trust. - For acquiring explicit knowledge: Focus is on formal contract. - For acquiring both explicit and tacit knowledge: Focus is on shared goals. - High Formal contract: Increases the impact of trust and shared goals on acquiring tacit and explicit knowledge.
21	Y. Li et al. (2010)	China	Local firm-foreign supplier	Not specified	Formal control	Social control; Length of cooperation; Institutionalizatiion	- In domestic partnerships: formal control and social control are substitutes.	- Long history of relationships: More social control is applied in international partnerships. - Long history of relationships: More formal control is used in domestic partnerships. - High institutionalization: Promotes the use of formal and social control mechanisms in both domestic and international partnerships. In international partnerships: Formal control and social control are complement.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
22	Zhao and Wang (2011)	China	Manufacturer-distributer	Not specified	Formal contract	Relational trust; Relationship learning	-	- Knowledge-based assets: Focus is on relational trust and relationship learning. - Property-based assets: Focus is on formal contract. - High relational trust: Declines the impact of relationship learning on relationship performance. - High market uncertainty and regulatory variability: Focus is on relational mechanisms.
23	Yang et al. (2011)	China	Manufacturer-distributer	Wide range of industries	Formal control	Trust; Social ties strength	- Strong social ties: Formal control decreases trust. - Strong social ties: While trust promotes long-term orientation, formal control decreases long-term orientation. - Strong social ties: While trust reduces opportunism, formal control doesn't have significant effect on controlling opportunistic behavior.	- Weak social ties: Formal control enhances trust. - Weak social ties: Both formal control and trust increase long-term orientation. - Weak social ties: Both formal control and trust curb opportunism.
24	L. Wang et al. (2011)	China	Manufacturer-supplier	Wide range of manufacturing industries	Contract	Trust	- For high innovation performance: Trust will be preferred. - High environmental uncertainty: Contract will be redundant and the impact of trust on innovation performance will be increased.	-

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
25	Arranz and Arroyabe (2012)	Europe	R&D partners	Bio-tech	Formal contract	Relational mechanisms: Relational norms; Trust	-	- High level of ambiguity (e.g., exploration projects): The focus will be on relational governance. - High level of volatility (e.g., exploitation projects): The focus will be on formal contracts.
26	Wallenburg and Schäffler (2014)	Germany	Alliance between logistics service providers	Not specified	Output control; Process control	Ex-ante joint action; Ex-post joint action	- In ex-ante performance measurement process (PMP): Joint action has its strongest direct effect on reducing opportunism and substitutes formal control.	- In ex-post performance measurement process (PMP): Joint action complements formal control.
27	Rhee et al. (2014)	Korea	SME's partnerships	Wide range of industries	Formal control: Transactional provision; Relational provision	Social control; Prior ties	- High environmental uncertainty: Using transactional contract provisions with social control is harmful to the relationship quality.	- High environmental uncertainty: relational contract provisions and social control complement each other. - Buyer lock-in (monopoly): Transactional contract provisions and social control complement each other.
28	L. Chen and Manley (2014)	Australia	Client-contractor	Construction	Formal mechanisms: Risk and reward sharing regime; Collective cost estimation; Risk sharing of service providers	Informal mechanisms: Leadership; Team workshops; Relationship manager; Communication systems; Design integration	-	- Informal mechanisms are greater predictor of project performance. - The relationship between formal governance and project performance is mediated by informal governance mechanisms.

Table 2-3 : Selected empirical studies on the choice and effects of governance mechanisms and their interactions (Cont.)

No.	Study	Country	Type of exchange	Industry	Contractual elements	Relational elements	Conditions for substitutability	Conditions for complementarity
29	Ping, Shuping, Lamei, Ping, and Xiaoyan (2014)	China	Client-contractor	Construction	Contractual governance: Fundamental elements; Change elements; Governance elements	Relational governance: Trust; Relational norms	-	- Contractual governance is more important for improving project performance. - Relational governance is more useful for mitigating opportunism.
30	Abdi and Aulakh (2014)	US	Foreign market entry partnership	Not specified	Contractual governance	Relational governance	- High level of environmental uncertainty: More formal contracting and relational governance mechanisms move toward a mutually weakening relationship.	- High level of behavioral uncertainty: More formal contracting and relational governance mechanisms move toward a mutually strengthening relationship.

Considering the types of resources used in the exchange, Hoetker and Mellewigt (2009) studied the efficacy of formal and relational governance mechanisms in exploiting knowledge-based and property-based assets in German alliance partnerships and showed that while formal governance was more useful in alliances with great extent of property-based assets, relational mechanisms were preferred in alliances where most of the assets were knowledge-based. Interestingly, the same results were found by D. Chen et al. (2009) and Zhao and Wang (2011) who investigated Chinese parent-IJVs relationships and manufacturer-distributer relationships, respectively. Likewise, Arranz and Arroyabe (2012) studied European R&D partnerships and showed that while a formal contract was more reliable in exploiting projects which were more explicit and predictable, relational governance was more effective in exploring projects which were more ambiguous.

With regard to asset specificity, Poppo and Zenger (2002) found that in exchanges with a high degree of asset specificity, formal contract was the primary mechanism for regulating the buyer-supplier relationships in US.

In terms of environmental uncertainty, the contingent effects of volatility and ambiguity were investigated. For example, Cannon et al. (2000) found that in buyer-supplier exchanges with a high level of task and environmental uncertainty, cooperative norms would moderate the impact of formal contract on performance. However, when uncertainty was low, cooperative norms were redundant, which shows how formal contract has a substitutive effect on cooperative norms. Similarly, Poppo and Zenger (2002) showed the complementary interactions between relational governance mechanisms and formal contracts in conditions of high uncertainty, with an emphasis on relational mechanisms. Although these findings were

supported by some other studies (Carson et al., 2006; Zhao & Wang, 2011), some contradictory results were also reported. For example, L. Wang et al. (2011) indicated that in highly volatile conditions, while trust promoted innovative performance, contract were destructive, and as a result, was redundant. Similarly, Abdi and Aulakh (2014) showed that as environmental uncertainty increased, formal contracting and relational governance mechanisms moved towards a mutually weakening relationship. However, Rhee et al. (2014) distinguished between transactional and relational contract provisions and reconciled the substitutive and complementary perspectives by showing the substitutive and complementary effects of transactional and relational contract provisions on social control, respectively. Carson et al. (2006) showed that when environmental uncertainty was high, contractual and relational governance mechanisms complemented each other, however, formal contracts seemed to be preferred choice under such conditions.

Behavior uncertainty was another contextual factor which Abdi and Aulakh (2014) found to be effective when the study investigated the partnerships between US companies and other foreign companies and showed that behavioral uncertainty encouraged contractual and relational governance mechanisms.

Regarding the role of expected future in knowledge accessing and knowledge acquisition, Lui (2009) investigated the buyer-supplier relationships in Hong Kong and found that when the chance of future transactions was low, competence trust became very critical in knowledge accessing, but it did not have significant impact on knowledge acquisition.

As shown in Table 2-3, buyer lock-in is another factor that received attention by Rhee et al. (2014) who analyzed the small business enterprise (SME) partnerships in Korea. The

results showed that in markets with a high degree of buyer lock-in, transactional contract provisions not only replace relational contract provisions, but also complement social control mechanisms.

As discussed before, some scholars referred to the history of relationships between partners as an antecedent for the interactions between governance mechanisms. For example, Luo (2002) found that the history of cooperation between partners determined the focus of a contract, that is, a longer history of interactions turned the focus of contract from term specificity to contingency adaptability. Wuyts and Geyskens (2005) reported that a detailed contract was substituted by close partner selection when the partners shared a long history of cooperation, however, the impact of formal contract on controlling opportunistic behavior was enhanced in short-term partnerships. In contract, (Y. Chen & Bharadwaj, 2009) showed that in IT client-vendor partnerships with a long history of collaborations the contracts, except property rights provisions, were typically very detailed. Lui (2009) considered interactions between formal contract and competence trust and then suggested that longer buyer-supplier relationships in Hong Kong increased the reliance of partners on formal control and competence trust for knowledge acquisition. However, the study also found that formal contract was not effective for knowledge accessing. Zhang et al. (2009) also showed that PPP members with a long history of prior interactions mainly relied on informal contracts. However, in a comparative study of domestic and international partnerships in China, Y. Li et al. (2010) found that while longer history of collaborations reinforced the reliance on social control mechanisms in international partnerships, it facilitated the use of formal contracts in domestic IORs.

The relationship phase has also been considered as another factor for analyzing the impact of prior ties on the choice of governance mechanisms; for example, Jap and Ganesan (2000) divided the history of relationships between partners into four phases: the build-up phase, the exploration phase, the maturity phase, and the decay phase. At the first stage, transaction-specific investments (TSIs) and explicit contract bounded partners' commitments while the relational norms moderated their impact on relationship performance. In the exploration phase, however, neither explicit contract nor relational norms were reliable and TSIs were primarily used to promote commitment among parties. The maturity phase was primarily governed by accumulated shared norms, which meant trying to promote relational norms was redundant. Finally, in the decay phase, both explicit contract and relational norms were essential for keeping the partners committed to the relationship. Poppo and Zenger (2002) divided the relationship background into the early years of relationships and the maturity phase, and showed that while formal contract was the main focus of governance in the early years, relational norms were more effective in the maturity phase. Ferguson et al. (2005) also supported the primary reliance on relational governance mechanisms in established exchanges, however, the results from Lee and Cavusgil (2006) challenged Poppo and Zenger (2002)'s findings by stating that the initial stages of forming an alliance were primarily governed with relational governance mechanisms. Another study conducted by Yang et al. (2011) showed that when the social ties among partners were weak, formal control enhanced trust and jointly promoted long-term orientation. However, with strong ties, formal control decreased trust and while trust promoted long-term orientation, formal control was destructive. Wallenburg and Schäffler (2014) applied another form of categorization by

dividing the performance measurement process (PMP) in horizontal alliances into ex-ante PMP and ex-post PMP phases. The study of German alliances showed that in an ex-ante PMP phase, joint action reduced opportunism directly and substituted formal control, whereas in an ex-post PMP phase, joint action and formal control were complementary.

The contingent effect of shared norms on the choice and effects of governance mechanisms has also been explored in some empirical studies. For example, Zhang et al. (2009) showed that the high level of shared values between partners enhanced the use of informal contract, while in another study, Y. Li et al. (2010) found that institutionalized shared norms promoted the use of formal and social control mechanisms in both domestic and international partnerships in China.

Prior empirical studies have referred to trust as one of the key contingency factors for the choice of governance mechanisms. For instance, Lui and Ngo (2004) showed that with a higher level of competence trust between partners, greater contractual safeguards were needed, but the same study also suggested that detailed contracts were redundant when the level of goodwill trust was high. In another study, Yu et al. (2006) showed that low goodwill trust led to a reliance on formal governance. Examining the control and coordination functions of governance mechanisms, Mellewigt et al. (2007) indicated that in low trust conditions, contractual complexity played a dual role of control and coordination, but in high trust relationships, trust took a safeguarding role and contract's function were limited to coordination. Şengün and Wasti (2009) showed that in a trusting atmosphere, output control was destructive, however, trust moderated the negative impact of output control on perceived performance. It was also found that trust enhanced the efficacy of social control, however

Zhao and Wang (2011) showed that a high level of relational trust reduced the impact of relationship learning on relationship performance. Regarding the contingent effect of calculative trust, Yu et al. (2006) found that high calculative trust decreased the reliance on formal governance mechanisms.

The contingent effect of culture and institutional environment on the efficacy of different governance mechanisms has already been considered in some previous empirical studies, but they are few in number. For example, Zhou and Poppo (2010) investigated the efficacy of explicit contracts and relational governance mechanisms in Chinese buyer-supplier relationships under different levels of legal enforceability. The results showed that where the perception of legal enforceability was strong, the focus of governance was on explicit contract, but when legal enforceability was perceived to be weak, the focus turned to the use of relational governance mechanisms. Y. Li et al. (2010) referred to institutional and cultural differences between domestic and international partnerships in China and showed that in these partnerships, formal control and social control mechanisms are substitutive and complementary, respectively.

Table 2-4 summarizes the conditions related to the choice and effects of governance mechanisms.

Table 2-4 : Main conditions studied in previous research regarding the choice and effects of governance mechanisms and their interactions

Category	Main factor	Dimensions	Representative research
Transactional conditions	Asset type	Property-based (tangible)	(Arranz & Arroyabe, 2012; D. Chen et al., 2009; Hoetker & Mellewigt, 2009; Zhao & Wang, 2011)
		Knowledge-based (intangible)	(Arranz & Arroyabe, 2012; D. Chen et al., 2009; Hoetker & Mellewigt, 2009; Zhao & Wang, 2011)
	Asset specificity	-	(Poppo & Zenger, 2002)
	Environmental uncertainty	Volatility (e.g., market dynamism, technological change)	(Abdi & Aulakh, 2014; Cannon et al., 2000; Carson et al., 2006; Poppo & Zenger, 2002; Rhee et al., 2014; L. Wang et al., 2011; Zhao & Wang, 2011)
		Task ambiguity (e.g., measurement difficulty)	(Cannon et al., 2000)
		Environmental ambiguity (e.g., uncertainty in the perception of environmental conditions and events)	(Carson et al., 2006)
	Behavioral uncertainty	-	(Abdi & Aulakh, 2014)
	Expected future	-	(Lui, 2009)
	Buyer lock-in (e.g., monopoly)	-	(Rhee et al., 2014)
Relational conditions	Prior ties	History of relationships	(Y. Chen & Bharadwaj, 2009; Y. Li et al., 2010; Lui, 2009; Luo, 2002; Wuyts & Geyskens, 2005; Zhang et al., 2009)
		Relationship phase (e.g., weak or strong social ties)	(Ferguson et al., 2005; Jap & Ganesan, 2000; Lee & Cavusgil, 2006; Poppo & Zenger, 2002; Wallenburg & Schäffler, 2014; Wuyts & Geyskens, 2005; Yang et al., 2011)
	Shared norms (e.g., shared goals, shared values)	-	(J. J. Li et al., 2010; Y. Li et al., 2010; Zhang et al., 2009)
	Trust	Competence trust	(Lui & Ngo, 2004; Şengün & Wasti, 2009)
		Goodwill (benevolent) trust	(J. J. Li et al., 2010; Lui & Ngo, 2004; Mellewigt et al., 2007; Şengün & Wasti, 2009; Yu et al., 2006; Zhao & Wang, 2011)
		Calculative trust	(Mellewigt et al., 2007; Yu et al., 2006)
Institutional conditions	Institutional environment (e.g., legal enforceability)	-	(Zhou & Poppo, 2010)
	Domestic or international partners (e.g., culture)	-	(Y. Li et al., 2010)

2.6 Gaps in the literature

In this section, three gaps in the literature are identified and discussed.

2.6.1 Ex-ante and ex-post relational governance mechanisms

A quick look at the reviewed studies shows that the definition of relational governance is still ambiguous and there are varied ways of measuring this construct. While some studies referred to prior ties and social embeddeness or pre-existing shared norms and/or trust among partners as relational governance mechanisms (e.g., Y. Chen & Bharadwaj, 2009; Lui & Ngo, 2004; Yu et al., 2006), others regarded these as contingent factors and antecedents for the choice of contractual and relational governance mechanisms (e.g., Luo, 2002; Wuyts & Geyskens, 2005). Further, some studies considered joint actions and collaborations during exchange relationships as relational governance mechanisms and measured accordingly (e.g., Cannon et al., 2000; e.g., Hoetker & Mellewigt, 2009). With the measurement of the relational governance construct, some used first-order constructs (e.g., Abdi & Aulakh, 2014; Poppo & Zenger, 2002), while others treated it as a second-order construct (e.g., Arranz & Arroyabe, 2012; Y. Liu et al., 2009).

These inconsistencies in the definition and measurement of relational governance mechanisms have contributed to the inconsistent findings on the interactions between contractual and relational governance mechanisms and made it difficult to accumulate and develop knowledge based on the previous work. For example, Lui and Ngo (2004) considered

goodwill trust as a relational governance mechanisms where the results supported the substitutive effect of relational governance on formal contracts. In contrast, Poppo and Zenger (2002) examined the role of relational governance by measuring the level of trust and shared goals between partners as well as their joint collaborations during the exchange and found that relational mechanisms and formal contacts are complementary.

One of the main criteria for conceptualizing and measuring relational governance mechanisms can be the nature of the mechanisms. As such, differentiating between the social bonds, norms and trust developed prior to the collaboration, and information exchange, joint actions and social exchanges that take place during the new exchange relationships can be helpful. As following discussion will show, such differentiation may help reconcile the seemingly contradictory findings in previous studies.

To address this issue, I used the social capital theory and social exchange theory to differentiate the role of ex-ante and ex-post relational governance mechanisms and conceptualize them as social capital and collaboration, respectively.

2.6.1.1 Social capital as ex-ante relational governance

Recurring interactions between partners can gradually create shared norms and promote a trustful atmosphere that may function as a governance mechanism (Poppo & Zenger, 2002). Previous studies examined the role of prior ties (e.g., Y. Chen & Bharadwaj, 2009), shared norms (e.g., Zhang et al., 2009), or trust (e.g., Mellewigt et al., 2007) in exchange performance. For example, Wuyts and Geyskens (2005) found that contract efficacy is contingent on the history of relationships between partners, such that the longer the past

relationships, the less will be the need for formal contracts to control opportunistic behavior. Similarly, Zhang et al. (2009) pointed out that prior ties and shared values among partners promotes the use of social control mechanisms. The same results was reported by Mellewigt et al. (2007) regarding the role of trust in safeguarding the relationships against opportunistic behavior. Supported by the extant literature on relational governance mechanisms and drawing on social capital theory I contend that prior ties, shared norms, and trust can be regarded as mechanisms for regulating the IORs and reflect different aspects of social capital. As discussed in the literature, social capital is a valuable asset obtained through social relationships by gaining access to other resources (Granovetter, 1985). According to the literature, social capital refers to the sum of the actual and potential resources that is embedded within, available through, and derived from social relationships, as well as the goodwill made available through such relationships (Adler & Kwon, 2002; Nahapiet & Ghoshal, 1998). As mentioned by Adler and Kwon (2002), "social capital resembles some kinds of capital and differs from others". This notion of social capital makes it particularly appropriate for this thesis.

According to the definition, capital is something valuable that is already available and is ready to be exploited. Social capital, like every form of capital, "is a long-lived asset into which other resources can be invested, with the expectation of a future flow of benefits such as superior access to information, power, and solidarity" (Adler & Kwon, 2002), and therefore it is arguably different from the social relationships from which social capital stems. That is, social capital itself is of value, regardless of whether the social interactions continue or not. First, as mentioned earlier, social capital provides access to some benefits which are not

available without it; second, "social capital is convertible to other kinds of capital such as economic capital" (Adler & Kwon, 2002), so in terms of the cost of governance, the existing shared norms and trust between partners may reduce the costs of negotiation, contract writing, and monitoring (Barney & Hansen, 1994; Cannon et al., 2000; Mellewigt et al., 2007); third, like other forms of capital, "social capital can either be a substitute for or can complement other resources" (Adler & Kwon, 2002).

For example, Yang et al. (2011) showed that in strong relationships, trust is better than formal contracts because formal mechanisms may promote distrust in the working environment. On the other hand, Mellewigt et al. (2007) considered both control and coordination concerns in exchange relationships and suggested that under high-trust situations, trust complements contractual complexity because formal contracts enable coordination in exchange relationships, whereas a trustful atmosphere addresses the control concerns and mitigates the probability of any opportunistic behavior.

In sum, I would argue that existing social capital among project partners which stems from past social relationships and collaboration between partners and is manifested by prior ties, shared norms and trust, can serve as a relational governance mechanism.

2.6.1.2 Collaboration as ex-post relational governance

As articulated by Adler and Kwon (2002), social capital should be maintained through regular recreation and reconfirmation of social bonds, otherwise it would lose its efficacy. I would argue that the process of creation/recreation and reconfirmation of social bonds is another form of relational governance that can be called collaboration. In other words,

collaboration is an ex-post relational governance that is not social capital by the time of application, but it includes tools and processes by which social capital is created. In this sense, the presence of ex-post relational governance in project partners' relationships could be identified by discovering the extent to which the partners openly exchange information, widely share ideas and initiatives, solve their conflicts and problems through joint consultation and discussions and participate in joint decision making (Heide & John, 1992; Jap & Ganesan, 2000; Y. Liu et al., 2009; Macneil, 1980). Based on social exchange theory and relational contracting theory, collaboration can promote solidarity that shifts the partners' views from self-centered behavior towards 'we-ness' feeling, whereas information exchange, on the other hand, reduces asymmetries through communication that can harmonize of conflict and honesty in the project. Finally, collaboration enables the partners to share common decisions and establish or revise the project objectives (Y. Liu et al., 2009; Rokkan, Heide, & Wathne, 2003). All these advantages can help the partners to control the opportunism, support integration, and promote value creation in joint activities.

To summarize, this study distinguishes between ex-ante and ex-post relational governance by referring to the former as social capital (e.g. prior ties, shared norms, trust) that has been embedded into partners' relationships through previous collaborations, and defining the latter as collaboration in the current exchange relationship (e.g. information exchange, solidarity, participation). In this study it is argued that these two forms of relational mechanisms can make different contributions to exchange performance. Accordingly, the first research question is as follows:

RQ1: By conceptualizing prior ties, shared norms, and trust as ex-ante relational governance while collaboration as ex-post relational governance, what are the joint effects of the two on performance?

2.6.2 The mediation effect of project control capability

Construction projects involve many complex processes and various uncertainties that should be controlled by project partners. For a successful partnership, project parties should be able to precisely specify their requirements and objectives, determine the characteristics of the proposed transactions, and identify the factors that cause transactional difficulties (Rahman & Kumaraswamy, 2002). For example, Naoum (2003) suggested that the ability of partners to define mutually agreed and measurable targets is an essential requirement for improving the productivity of the partnership. In another study, Turner and Simister (2001) showed that one of the main criteria for choosing between different types of governance mechanisms is the ability of the project partners to resolve the problems, indeed these findings showed that the ability of the partners to apply various types of governance mechanisms will contribute to the partnership outcomes. In other words, even if the best governance mechanisms are selected, it does not guarantee satisfactory outcomes if the partners lack experience and/or understanding of the mechanisms.

For example, since many construction activities need to comply with various technical and management standards, behavior control seems most likely because identifying and correcting errors early on in the construction process is critical. As a result, their ability to identify the activities and their sequences and interrelationships, and to assign resources to the

specified activities, and then monitor the progress of the project team towards project objectives, means that it is necessary to have effective behavior/process control. Similarly, to exercise output control, the partners should be able to set the project objectives and measure their compliance to the expected outcomes. Hence, project control capability appears to be a critical factor in the choice and effects of governance mechanisms.

Prior studies within the organizational control domain suggested that the choice of control mechanisms can be affected by task programmability and outcome measurability (Eisenhardt, 1985; Kirsch, 1996; Ouchi, 1977, 1979; Tuuli et al., 2010). Borrowing from Perrow (1965), Reeves and Woodward (1970), and Thompson (1967), Ouchi in his seminal framework (Ouchi, 1977, 1979) argued that understanding the transformation process and being able to measure outputs are the two antecedents for the choice of control mechanisms (e.g., behavior control, output control). Ouchi explained (Ouchi, 1977, p. 4):

> *"… in order to apply behavior control, the organization must possess at least agreement, if not true knowledge, about means-ends relationships. The process through which inputs are transformed into outputs must be felt to be known before supervisors can rationally achieve control by watching and guiding the behavior of their subordinates."*

However, he also believed that adopting output control was different and "the transformation process need not be known at all, but a reliable and valid measure of the desired outputs must be available" (Ouchi, 1977, p. 4).

In his subsequent work (Ouchi, 1979), Ouchi introduced clan control as a new control mechanism and argued that if an organization is unable to exercise monitoring or evaluate the

outputs, the preferred control mechanism will be clan control which can be exercised through social exchanges between personnel and sharing organizational attitudes, values, and beliefs.

		Knowledge of the transformation process	
		Perfect	Imperfect
Ability to measure outputs	High	Behavior control or Output control	Output control
	Low	Behavior control	Clan control

Figure 2-1 : Conditions for the selection of control mechanisms (Adapted from Ouchi, 1979)

Eisenhardt (1985) showed that the choice between behavior-oriented contract or outcome-oriented contract was contingent on the level of task programmability. That is, the more knowledge the partners have about the project tasks and transformation process, the more the contract will be behavior-oriented. While Eisenhardt (1985) emphasized the contingent effect of task characteristics by referring to task programmability and outcome measurability, Kirsch (1996) distinguished between task characteristics and controller's capabilities—understanding and utilizing task information for control purposes—and suggested that the latter is important in the choice of control mechanisms. That is, even if the information about the transformation process and the outcome measures is available, the controller must be able to transform the information into knowledge and use it to exercise the control, otherwise the information will remain useless (Kirsch, 1996; Kirsch, Sambamurthy, Ko, & Purvis, 2002).

Similarly, Tiwana and Keil (2009) distinguished between attempted and realized control where attempted control refers to the degree to which a controller implements governance mechanisms, and realized control reflects the degree to which the controller can successfully

exercise the governance mechanisms (Tiwana & Keil, 2009). Based on this differentiation, Tiwana and Keil (2009) explained the contradictory results on the relationship between the use of governance mechanisms in internal and outsourced projects and project performance. The results showed that while outsourced projects had greater usage of governance mechanisms compared to internal projects, the improvement in performance was less observed in outsourced projects. The study suggested that even though attempted control is motivated by transaction hazards, realized control is facilitated by meeting specific informational and social prerequisites, and since the specific informational and social requirements were not developed very well in outsourced projects, control realization was not achieved as expected.

Although this differentiation was developed in past literature, one question remained unanswered; how control capability interacts with governance mechanisms to impact on exchange performance?

Building on the aforementioned argument and addressing the above question, I submit that to achieve the expected results from exercising governance mechanisms, the project partners must have enough 'project control capability' and this capability can be improved by the use of governance mechanisms. In other words, 'project control capability' plays a mediating role in the relationship between governance mechanisms and performance, that is, even though governance mechanisms have been appropriately selected, if they cannot enhance the partners' 'project control capability', they will lose their efficacy. Supporting this proposal, Tuuli et al. (2010) showed how formal control mechanisms can particularly be redundant in construction projects when the project partners are inexperienced or do not have

enough knowledge of the project. As another example, previous research into the construction industry recognized that ineffective communications between the project partners was the main obstacle to success (Cheng, Li, Love, & Irani, 2001; Thamhain, 1992; S. R. Thomas, Tucker, & Kelly, 1998), and S. R. Thomas et al. (1998) identified six critical concerns regarding communications (Table 2-5) that should be considered in implementing effective collaborations. In other words, since the establishment and implementation of communication channels incur additional costs and require the project team to spend some time for interactions, ignoring these concerns may lead to ineffective communications and project failure.

Table 2-5 : Critical concerns regarding communication setup (S. R. Thomas et al., 1998)

Critical concern	Description
Accuracy	The accuracy of information received as indicated by the frequency of conflicting instructions, poor communications, and lack of coordination
Procedures	The existence, use and effectiveness of formally defined procedures outlining scope, and methods, etc.
Barriers	The presence of barriers (interpersonal, accessibility, logistic, or other) interfering with communications between supervisors or other groups
Understanding	An understanding of information expectations with supervisors and other groups
Timeliness	The timeliness of information received including design and schedule changes
Completeness	The amount of relevant information received

In sum, I contend that (1) appropriate combination and effective use of governance mechanisms can promote 'project control capability', and (2) 'project control capability' mediates the impact of governance mechanisms on exchange performance. Thus, the second research question is as follows:

RQ2: How does 'project control capability' interact with governance mechanisms to impact on performance?

2.6.3 Contingent effect of culture and contract enforceability

Given the importance of the choice of appropriate governance mechanisms, it is important to know whether the efficacy of contractual and relational governance mechanisms is constant in different cultural and legal contexts. As noted by North (1990), contract enforceability is likely to have a noticeable impact on the efficacy of different governance mechanisms. For example, North and Weingast (1989) suggested that in countries without effective legal systems, formal contracts are not reliable because it is very difficult to enforce expectations and promises.

On the other hand, some scholars referred to the national culture as a 'shifting parameter' and argued that a country's culture impacts on the choice of IORs governance mechanisms (Yang et al., 2011). For instance, in individualistic and low uncertainty avoidance cultures (e.g., Western countries) formal mechanisms are more reliable (de Pablos, 2005), whereas in collectivist cultures with high uncertainty avoidance (e.g. East Asia and middle east) social norms and relational mechanisms play the primary role in regulating these relationships (Luo, 2007).

To better understand of the relationship between culture and the legal system, and their interactions with IORs governance mechanisms, it is necessary to put them in a larger context of a social system. In doing so Williamson (2000) identified four levels of social analysis to show the relationships between different levels of a social system (Figure 2-2), where the solid arrows show the constraints imposed by a higher level construct to the immediate below level

construct, and the dashed arrows indicate the feedback from bottom levels towards the upper levels.

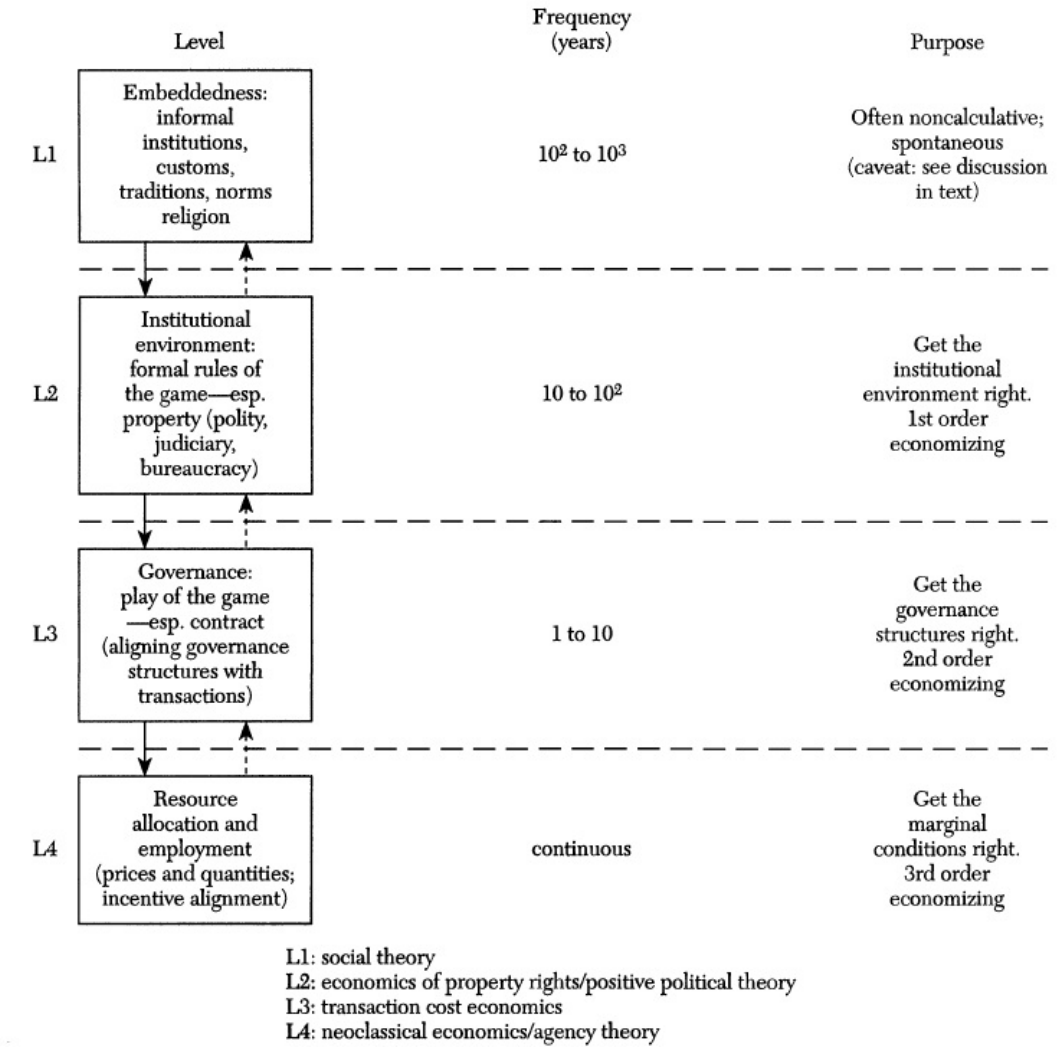

Figure 2-2 : Inter-relationships between different levels of a social system (Williamson, 2000)

The first level is dedicated to culture (social embeddedness) in which the norms, beliefs, customs, and traditions are located. As defined by Kroeber and Parsons (1958, p. 583), culture includes "transmitted and created content and patterns of values, ideas, and other symbolic-meaningful systems as factors in the shaping of human behavior and the artifacts produced

through behavior". This level has been taken as a given by most institutional economists who believe that the mechanisms through which culture and its informal institutions arise and are maintained have principally unplanned origins; in other words there is no deliberate or calculated choice involved (Williamson, 2000). These informal institutions are formed through an evolutionary process and gradually adopted by the people, and after a while the resulting informal institutions become an inseparable part of a society that displays a great deal of inertia.

The second level is referred to as 'institutional environment' which is partly affected by the evolutionary formation of informal institutions despite there being design opportunities for establishing 'formal rules' such as constitutions, laws, and property rights. As a result, first-order economizing can begin from this level by establishing a formal framework and formulating 'rules of the game' (Williamson, 1991), because as Williamson (2000) stated, "executive, legislative, judicial, and bureaucratic functions of government as well as the distribution of powers across different levels of government" are common instruments for establishing formal institutions at this level. Furthermore, it features the establishment and enforcement of property rights and contract laws.

Although formal institutions are necessary tools for improving the economic productivity of an economy by eliminating chaos in the business environment, to streamline the working process through established legal systems (the rules of the game), there is a need for institutions through which contractual relations (the play of the game) could be regulated; in fact these are governance institutions located at the third level. Since exchange parties are mainly responsible for managing contracts and resolving disputes—e.g. through private

ordering—the governance of contractual relations must be addressed at this level, that is, proper contractual and relational governance mechanisms should be selected by the exchange parties to regulate the IORs (Williamson, 2000).

As shown in Figure 2-2, the governance mechanisms located on the third level of the social system are probably affected by the two upper levels—the legal system and culture, so these two factors must be considered as important contextual factors that influence the choice and effects of governance mechanisms.

2.6.3.1 Governance mechanisms and the culture

As described earlier in this chapter, TCE is one of the underlying theories regarding the choice and effects of governance mechanisms in which opportunism is a key assumption, however, such an emphasis on opportunistic nature of all human beings has received a large number of criticisms (C. C. Chen, Peng, & Saparito, 2002; Conner & Prahalad, 1996; Granovetter, 1985; Kogut & Zander, 1996). Consequently, researchers tried to clarify and strengthen this assumption by introducing a number of contingent factors such as culture to explain the variation of this behavioral feature in different contexts. For example, Ghoshal and Moran (1996) argued that it may be unrealistic to assume opportunism as a constant factor across individuals and organizations around the world. In the same way, C. C. Chen et al. (2002) made further theoretical progress by explaining the impact of cultural differences on the likelihood of opportunistic behavior as well as the efficacy of governance mechanisms to mitigate this problem. Drawing upon social and cross-cultural psychology literature, they pointed out that "an economic actor's opportunistic propensity is affected by one's cultural

prior conditioning of individualism-collectivism and its associated feelings of moral obligations toward different transactions" and proposed a number of hypotheses to be examined in future studies. However, despite frequent calls to examine the role culture plays on the efficacy of governance mechanisms (e.g., Poppo & Zenger, 2002; Reuer, Ariño, & Mellewigt, 2006), to the best of my knowledge, very few studies (e.g. Y. Li et al., 2010) have addressed this concern. For example, Y. Li et al. (2010) compared the role of formal and social control mechanisms in domestic and international buyer-supplier relationships in China and found that while formal and social control mechanisms are a substitute in domestic partnerships, they complement each other in international transactions.

Although a comparison of domestic and international partnerships provides some useful information about the impact of culture on the choice and effects of governance mechanisms, since the international partners are usually from a variety of cultures, the results are not very informative. To address the gap, this study aimed to examine the impact of culture on the efficacy of governance mechanisms through conducting a cross-cultural study in two culturally different countries.

Hofstede's national culture dimensions (Hofstede, 2001; Hofstede, Hofstede, & Minkov, 2010) are one of the most widely used measures for cross-cultural comparisons. The six dimensions of culture include power distance, individualism, masculinity, uncertainty avoidance, pragmatism, and indulgence. In the most recent edition of Hofstede's work (Hofstede et al., 2010), scores on each of these six dimensions were calculated and listed for 76 countries and regions around the world.

Of these six dimensions, individualism has consistently been regarded as a core dimension for distinguishing different cultures (Cannon, Doney, Mullen, & Petersen, 2010; Cialdini, Wosinska, Barrett, Butner, & Gornik-Durose, 1999; Crossland & Hambrick, 2011; Hofstede, 1980), so this study used this dimension as a contingent factor for the choice and effects of governance mechanisms in two different cultural contexts. Individualism and collectivism represent opposite ends of the same dimension because in individualistic cultures self-serving behavior prevails and people prioritize their own interests over the interests of the society, whereas in collectivist societies loyalty and strong long-term commitment to group members overrides most other considerations and violating the social norms leads to shame and loss of face (Hofstede, 1980).

2.6.3.2 Governance mechanisms and the contract enforceability

Based on the conventional view of economic development, formal institutions, such as courts and contracts, enable economies to grow and to be successful and the inability to develop a court system that can enforce contracts is the most important basis for both historical depression and current underdevelopment in the third world (Mahoney, 2005; North, 1990; Zhou & Poppo, 2010). As noted by Williamson (2000), the establishment of property rights is of second importance after culture in the economics of institutions in a social system. Coase (1959, p. 12) asserted that "a private-enterprise system cannot function properly unless property rights are created in resources … a legal system to define property rights and to arbitrate disputes is, of course, necessary". Similarly, Williamson (2000) highlighted the importance of the definition and enforcement of property rights and contract laws in regulating

contractual relations. While unpredictability of legal institutions discourages reliance on contractual agreements and in turn encourages managers to substitute formal contracts with relational mechanisms, an effective legal system may alleviate the need to rely on relational mechanisms (Mike W Peng, 2003; Xin & Pearce, 1996).

Based on the above argument, it is expected that contract enforceability causes significant impact on the choice and effects of contractual and relational governance mechanisms in regulating transactional relationships, however, this area of research is still underexplored and very few studies have addressed this concern (e.g., Y. Li et al., 2010; Zhou & Poppo, 2010). As explained in the previous section, Y. Li et al. (2010) conducted a comparative study between domestic and international partnerships in China and explained the differences in the two samples by referring to the cultural and legal differences, but they did not specify any criterion for measuring the cultural and legal differences in the cases. By measuring the perceived contract enforceability, Zhou and Poppo (2010) examined the choice and effects of explicit contracts and relational reliability in buyer-supplier relationships in China and found that the formality or informality of governance mechanisms changed in different partnerships depending on the perceived contract enforceability. However, the authors questioned the generalization of their findings by referring to the limited context of the study—only two Chinese provinces—and called for further research to assess the role of contract enforceability in countries with established legal systems. To fill the gap, this thesis aimed to conduct a comparative study in order to examine the impact of contract enforceability in countries with weak/strong legal systems on the efficacy of governance mechanisms.

In recent years, aggregate indices of the quality of governance, called Worldwide Governance Indicators (WGI), have become very popular in cross-national studies (Langbein & Knack, 2010). WGI was developed by a group of World Bank researchers and since 1996, covers over two hundred countries for six aggregate indicators of broad dimensions of political governance, including: (1) voice and accountability, (2) political stability and the absence of violence/terrorism, (3) governance effectiveness, (4) regulatory quality, (5) rule of law, and (6) control of corruption (Kaufmann, Kraay, & Mastruzzi, 2011). Although the validity and reliability of directly using these dimensions as theoretical constructs in hypotheses has been doubted and criticized by some scholars (Apaza, 2009; Langbein & Knack, 2010; M. A. Thomas, 2010), they could be used as a good differentiator between countries. For example, the index of 'rule of law' was defined as: "the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence" (Kaufmann et al., 2011).

To summarize, this thesis attempts to fill the gap in the previous IORs governance literature by conducting a comparative research in two culturally and legally different countries, in order to study the impact of individualistic/collectivistic attitudes and high/low contract enforceability on the choice and effects of governance mechanisms in client-contractor relationships. Thus, the third research question is as follows:

RQ3: How do culture and contract enforceability impact the choice and effects of governance mechanisms?

2.7 Chapter summary

In this chapter the concept of governance and its applications in the IORs domain were described and multiple functions of contractual and relational governance mechanisms (e.g., safeguarding, integration, value creation), as well as their underlying theoretical perspectives were explained. Then, the literature on the choice and effects of governance mechanisms was reviewed and three major gaps were identified. First, the review showed that previous studies did not differentiate between relational mechanisms such as prior ties, shared norms, and trust that are originated from past relationships and other relational mechanisms such as information exchange and joint actions which were established during the current exchange relationships. Since the source of these two types of relational governance is different, this study conceptualized the former as social capital—ex-ante relational governance—and the latter as collaboration—ex-post relational governance—and posited that they act differently in explaining the exchange performance. The second gap in the literature was related to the impact of partners' control capabilities on exercising governance mechanisms. Although past literature regarded the partners' knowledge of the transformation process and their ability to measure the outcomes as antecedents for the choice of governance mechanisms (e.g., behavior control, outcome control, clan control), it did not consider the influence of utilizing governance mechanisms on the development of these control capabilities and the consequent impact of these capabilities on exchange performance. Thus, this study conceptualized a new construct of 'project control capability' to examine the mediation effect of this construct on the relationship between governance mechanisms and exchange performance. Finally, the

literature did little to explain the impact of culture and contract enforceability on the choice and effects of governance mechanisms. As such, this thesis aimed to fill the gap by conducting a comparative research in two culturally and legally different contexts.

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CHAPTER THREE: THEORETICAL FRAMEWORK

- ***Introduction***
- ***Research questions***
- ***Theoretical framework and hypotheses***
- ***Chapter summary***

3.1 Introduction

An exhaustive review of the IORs literature on the choice and effects of governance mechanisms led to the identification of three gaps in the past literature and shaped the scope of this research. Addressing the identified gaps, this chapter presents the research questions and develops the research hypotheses and the theoretical framework.

3.2 Research questions

According to the identified gaps in the literature, the following research questions are recommended:

4. By conceptualizing the prior ties, shared norms, and trust as ex-ante relational governance while collaboration as ex-post relational governance, what are the joint effects of the two on performance?
5. How does 'project control capability' interact with governance mechanisms to impact on performance?
6. How do the culture and the contract enforceability impact the choice and effects of governance mechanisms?

Addressing these research questions, research hypotheses and theoretical framework are developed in the following sections.

3.3 Theoretical framework and hypotheses

3.3.1 Interactions between governance mechanisms

As explained in previous chapter, this study differentiates between social capital and collaboration as ex-ante and ex-post relational governance mechanisms, respectively. At this part, I examine interactions between formal contract, social capital, and collaboration.

3.3.1.1 Social capital and formal contract

The literature on the relationship between social capital and formal contract supports their substitutability. The advocates of this view believe that trust reduces the transaction costs by "replacing contracts with handshakes" (Adler, 2001). Dyer and Singh (1998) argued that informal agreements which are self-enforcing and are based on trust and reputation can supplant formal arrangements. Gulati (1995) contends that trust avoids contracting and monitoring costs and provides more flexibility for adaptation to new exchange conditions. Similarly, Uzzi (1997) believes that embedded norms within social structures reduce transaction costs by alleviating the time and cost needed for contract negotiations. In line with this substitutive view, some scholars refer to the negative effect of formal contracts on trust and believe that detailed negotiated contracts signal the lack of trust and discourages cooperation (Kadefors, 2004; Macaulay, 1963). For example, Luo (2002) believed that although prior ties between partners enhances contractual completeness, it reduces term specificity. Therefore, I hypothesize:

H1: *Social capital has negative impact on the use of formal contract.*

3.3.1.2 Formal contract and collaboration

With providing an institutional framework, formal contract can guide the course of cooperation among project partners (Chua, Lim, Soh, & Sia, 2012; Poppo & Zenger, 2002). Baker, Gibbons, and Murphy (1994) argue that formal contracts not only discourage the pursuit of short-term gains by specifying a long-term commitment to exchange, but also limit the gains from opportunistic behavior by providing clear provisions that specify punishment. This reduction in short-term gains consequently motivates the gains from cooperation in the exchange relationship. As noted by Poppo and Zenger (2002), more customized contracts can also increase the level of established and developed norms, and consequently, promote collaborations. Similarly, Chua et al. (2012, p. 21) revealed that "formal controls can establish shared structure, cognition, and relationships to facilitate the development of clan control or reinforce/inhibit clan norms". In sum, formal contract introduces formal procedures and guidelines for communications among project team members and senior managers (e.g., information exchange, reports, meetings) that lead to more structured and regular interactions among project partners. Therefore, I hypothesize:

H2: *Formal contract has positive impact on collaboration between partners during the project.*

3.3.1.3 Social capital and collaboration

Some scholars hold that social capital can facilitate information exchange and knowledge transfer among partners (Adler & Kwon, 2002; Inkpen & Tsang, 2005; Nahapiet & Ghoshal, 1998) and promote clan control (Chua et al., 2012; Kirsch et al., 2010). For

example, Kirsch et al. (2010) asserted that social capital with its all three forms of structural social capital (e.g., access to individuals and information resources), cognitive social capital (e.g., shared values, shared goals), and relational social capital (e.g., trust) provides conditions for informal interactions, open discussions, and free-flowing communications which are building blocks of clan control. In the same way, Chua et al. (2012) suggested that social capital is necessary for building the clan, and without social capital in place, leveraging the clan is impossible. Similarly, Morgan and Hunt (1994) contended that trust promotes relational norms such as information exchange, solidarity, and participation. It means that social capital, as a product of intensive social interactions in the past, provides trustful environment and enhances partners' understanding of each others' priorities, cultures, and objectives which can lubricate the relationships for doing joint activities and joint decision making. Thus, I hypothesize:

H3: *Social capital has positive impact on collaboration between partners during the project.*

3.3.2 The impact of governance mechanisms on project control capability

To examine the second research question regarding the impact of governance mechanisms on project control capability, relevant hypotheses are developed in this part.

3.3.2.1 Collaboration and project control capability

As proposed by L. Liu and Zhu (2007), the levels of task programmability and outcome measurability increase throughout the project life cycle. That is, information exchange and socialization among project partners can enhance partners' confidence about the project work

and counterpart's behavior and facilitate joint decision making and joint problem solving (Selnes & Sallis, 2003). In other words, with more collaboration between project team members, they can more effectively transfer their accumulated knowledge and experience, and consequently, have a better understanding of the project process and project tasks as well as the sequence of the activities and resource allocation. In the same way, more collaboration can make project team's behavior and the way they approach expected project outcomes more observable and traceable. When partners exchange information about the project progress and different issues encountered during the project, they can update project plans and track the updated version of the project performance to estimate divergence from initial objectives and take remedial actions if needed. Therefore, I hypothesize:

H4: *Collaboration between partners has positive impact on project control capability.*

3.3.2.2 The mediation effect of collaboration

Formal contracts are effective tools for bringing transparency into partners' relationships by clarifying all the rights and responsibilities of the two sides, defining the scope, objectives, and expected outcomes of the project, and determining the measures and procedures for controlling the project team's behavior as well as the team's progress towards project outcomes. Contracts set specific project targets which propels project partners to collaborate in order to successfully deliver the project through resolving problems. It can also enhance project control capability by providing a common ground for sharing knowledge and experience on contract negotiation and contract development as well as contract enforcement. However, these advantages would not be achieved in the absence of collaboration between

partners (Rahman & Kumaraswamy, 2002). Although unambiguous contract provides clear targets for project partners, the effective delivery requires close collaboration between partners. That is, the provisions specified within the contract should be effectively and exhaustively communicated in order to be usefully and successfully implemented. Therefore, I hypothesize:

H5: *The positive impact of formal contract on project control capability is fully mediated by collaboration between partners.*

On the other hand, social capital may account for project control capability through providing more information about the partner's behavior and sharing more confidence between project parties (Adler & Kwon, 2002). The partners who have been working together for a long time may have good understandings of the points of strengths and weaknesses in counterpart's behavior. It will, consequently, assist them to find the bottlenecks in their relationships and focus on those areas. Additionally, shared goals and values may reduce the asymmetries and enable the parties to better communicate their aims and objectives about the project (Zhang et al., 2009). Correspondingly, this knowledge enhances the controllability of the project and reduces the uncertainty. However, social capital by itself cannot guarantee the expected advantages. That is, social bonds among partners need to be recreated and reconfirmed through collaborative joint actions and information exchange. Otherwise, they may lose their efficacy (Adler & Kwon, 2002), and as a result, their significant impact on project control capability may be disappeared. Therefore, I hypothesize:

H6: *The positive impact of social capital on project control capability is fully mediated by collaboration between partners.*

3.3.3 The impact of governance mechanisms on exchange performance

As explained in literature review section, the governance mechanisms may have different functions (e.g., safeguarding, integration, value creation), and the aim of using these mechanisms may be different. As shown in previous chapter, the efficacy of governance mechanisms and their interactions may differ based on the expected outcomes. Following Lui and Ngo (2004) and Jin, Doloi, and Gao (2007), this study differentiates between project (time&cost) performance and relationship satisfaction. Where project (time&cost) performance refers to the integration function of governance mechanisms which promotes coordination and cooperation among partners and leads to successful implementation of the project in terms of meeting time and cost objectives, relationship satisfaction adopts the value creation view and attempts to measure the long-term benefits of the cooperation by referring to the partners' satisfaction with their cooperation, its contribution to their core competencies, and their hope for future collaborations.

3.3.3.1 Relational governance mechanisms and relationship satisfaction

Prior research in IORs domain shows that relational governance mechanisms promote relationship satisfaction. For example, Lui and Ngo (2004) showed how goodwill trust between partners enhances relationship satisfaction in terms of achieving goals and adding to partners' long-term success. Similarly, Jap and Ganesan (2000) indicated how information exchange, solidarity, and participation can develop commitment between partners and enhance the chance of future collaborations.

Sociologists and psychologists refer to trust and reciprocity as "the basis of all human systems of morality" (Nowak & Sigmund, 2000) and differentiate between trust and social exchanges by referring to the former as the main motivator for emergence of the latter (Coleman, 1990; Messick & Brewer, 1983). The common sense in previous cross-cultural research was that in a collectivistic culture people place more importance on relationships than individualists and therefore trust would be higher among collectivists (C. C. Chen, Chen, & Meindl, 1998; Triandis, 1995), however, a deeper examination of social behavior in two cultures revealed that in a collectivist society in-group and out-group members are treated very differently (Triandis, 1995). For example, Watkins and Liu (1996) asserted that the quality of social interactions between individuals in a collectivist society differs substantially when the exchange partner changes from an in-group member to an out-group member. That is, people in collectivist societies are relatively suspicious of strangers and commonly use avoidance behaviors and even try to compete with and exploit out-groups more extensively than those of individualistic cultures (Huff & Kelley, 2005; Watkins & Liu, 1996). Watkins and Liu (1996), then concluded that trust within in-groups would be higher for collectivists than individualists, while trust for out-groups would be higher for individualists than collectivists. Similarly, Buchan, Croson, and Dawes (2002) suggested that the speed at which universal solidarity will be realized is likely to vary across different cultures. In this study, people from different cultures were asked to participate in multiple experiments. Experiments were designed to examine the extent to which the level of trust and reciprocity with in-groups and out-groups changes based on the cultural differences between participants. The results of the study showed that where individualist participants quickly adopted the notion of the group

by reflecting higher levels of trust toward 'neighbors' than toward 'strangers', collectivist participants did not embrace the group, but instead persisted in treating all participants in the experiment as strangers. The authors concluded that in collaborating with new partners collectivists should travel relatively longer road to embrace solidarity comparing with individualists that cope much easier to new partnerships (Buchan et al., 2002).

Based on the above argument, I contend that in a collectivistic culture, social capital plays the main role in promoting relationship satisfaction, however, when the partners are new to each other and the level of social capital is low, they are suspicious of each other and try to evaluate each other's capabilities. If their collaboration added to project control capability, they gradually accept the new partner as an in-group member and this collaboration leads to successful partnership with developing commitment and opening new avenues for future work. Thus, I hypothesize:

H7a: *In countries where the culture is collectivistic,*

1. *social capital has positive impact on relationship satisfaction;*
2. *collaboration has indirect effect on relationship satisfaction through project control capability.*

In individualist cultures, although social capital is important and provides better conditions for collaboration, the focus is on current relationship and the level of reciprocity between partners. Therefore, even in the absence of social capital and past relationships, the partners put their effort to develop their social interactions to exploit the opportunities and develop commitment and their core competencies. Hence, I hypothesize:

H7b: *In countries where the culture is individualistic,*

1. *collaboration has positive impact on relationship satisfaction;*
2. *social capital has indirect effect on relationship satisfaction through collaboration.*

3.3.3.2 Formal contract and relationship satisfaction

The findings of prior studies regarding the impact of formal contract on relationship satisfaction are inconsistent. For example, Jap and Ganesan (2000) showed that formal contract decreases the partners' commitment by impeding flexibility and signaling distrust. However, Lui and Ngo (2004) indicated that the negative effect of contractual safeguards on relationship satisfaction is contingent to the level of trust between partners. That is, while in low trust conditions formal contracts have positive impact on relationship satisfaction, in high trust relationships it can be destructive. In contrast, some studies asserted that formal contracts have positive impact on relationship satisfaction (Ferguson et al., 2005). Reconciling this debate, some scholars contended that the negative effect of formal contract depends on use of the relational governance mechanisms. That is, when the partners utilize formal contract along with relational mechanisms such as joint actions and social interactions, the joint effect of these mechanisms on relationship satisfaction would be complementary and positive (J. J. Li et al., 2010; Luo, 2002). The reason for this complementary effect is that relational mechanisms can mitigate the negative consequences of formal contracts by providing flexibility and trustful conditions.

Other factors that may be influential in determining the efficacy of formal contracts are cultural and legal characteristics of the exchange environment. For example, North and Weingast (1989) suggested that in countries without effective legal systems, formal contracts

are not reliable because it is very difficult to enforce expectations and promises. Similarly, Zhou and Poppo (2010) showed that formal contract can enhance relationship satisfaction only if the partners have strong perception of legal enforceability. Otherwise, formal contract loses its efficacy and the partners will focus on relational governance mechanisms. With respect to the cultural characteristics, formal contracts are more likely to be used in individualistic cultures (de Pablos, 2005), however, in collectivist cultures social norms and relational mechanisms play the primary role in regulating the relationships (Luo, 2007).

According to above arguments, I contend that in countries with collectivistic culture and low contract enforceability, formal contract cannot contribute to relationship satisfaction. In contrast, in individualistic societies with high level of contract enforceability, formal contract plays considerable role in enhancing relationship satisfaction, however, its positive impact is conditional to the use of relational mechanisms such as social interactions and information exchanges. Thus, I hypothesize:

H8a: *In countries where the culture is collectivistic and the contract enforceability is low, formal contract has non-significant impact on relationship satisfaction.*

H8b: *In countries where the culture is individualistic and the contract enforceability is high, formal contract has indirect effect on relationship satisfaction through collaboration.*

3.3.3.3 Relational governance mechanisms and project (time&cost) performance

Relational governance mechanisms such as relational norms can help partners to fulfill time, cost, and quality requirements of the project by facilitating coordination and cooperation

among partners (Hatten et al., 2012; Jha & Iyer, 2007; Macneil, 1978). Similarly, trustful relationships facilitate joint actions (Claro et al., 2003) by ensuring the partners about capabilities of the exchange partner (competence trust) and its goodwill (benevolent trust). For example, Sohn (1994) contended that embedded social knowledge enhances coordination between exchange parties by making the partner's behavior both foreseeable and understandable. It is also argued that social interactions lead to shared values and shared objectives which would consequently promote coordination and cooperation among partners (Kirsch et al., 2010; Ouchi, 1979). However, the dark side of these relational mechanisms has been addressed by some scholars as well (Cheng et al., 2001; Thamhain, 1992; S. R. Thomas et al., 1998). For example, S. R. Thomas et al. (1998) argued that ineffective communication between project partners may hinder project success.

Since the project (time&cost) performance is measured based on pre-specified objectives in the contract, it is probable to be affected by contract enforceability. That is, if the contract enforceability is high, it would be more likely to have link between exercising control and achieving good project (time&cost) performance. On the contrary, where the contract enforceability is low, even if the partners hold well-developed control capabilities and effectively exercise control mechanisms, there is no guarantee for meeting project objectives. So in the absence of enforceable and practicable contracts, social capital is the only effective mechanism that can keep the project on the track. That is, under uncertain conditions in which contract cannot be enforced, if the partners share high level of social capital, their relationships would no longer be based on reciprocal transactions, but it would noticeably be trust-based. In other words, if one of the partners could not fulfill its promises, the other party

keeps doing its work, because he is confident about his partner's goodwill and knows that sooner or later he would accomplish his allocated task. Consequently, interruptions in project work would considerably be decreased and project objectives would be less affected. Additionally, the efficacy of relational governance mechanisms may be affected by the cultural context of the project. Where social capital that is based on in-groups relationships is very influential in improving project (time&cost) performance in collectivistic cultures, collaboration that is built on reciprocity among partners would be more effective in individualistic cultures.

Based on the above arguments, I posit that social capital is the primary governance mechanism for improving project (time&cost) performance in countries with collectivistic culture and low contract enforceability. In contrast, in individualistic countries with high contract enforceability, collaboration has more contribution to project (time&cost) performance, however this contribution is conditional and is mediated by project control capability and relationship satisfaction. That is, it is effective collaboration that improves project (time&cost) performance. If the collaboration could not enhance project control capability, it would be considered redundant. Because ineffective collaboration not only imposes extra time and money on project partners without providing any tangible outcome, but also leads to adversarial relationships. Thus, I hypothesize:

H9a: *In countries where the culture is collectivistic and the contract enforceability is low, social capital has positive impact on project (time&cost) performance.*

H9b: *In countries where the culture is individualistic and the contract enforceability is high, Collaboration has indirect effect on project (time&cost) performance through project control capability.*

3.3.3.4 Formal contract and project (time&cost) performance

The findings of prior research show that formal contract has positive impact on project (time&cost) performance by specifying rights and obligations of both parties, defining procedures and guidelines, clarifying the scope and objectives of the project, and paving the ways for negotiations, that will ultimately improve coordination among partners (Carson et al., 2006; Jap & Ganesan, 2000; Mayer & Argyres, 2004; Poppo & Zenger, 2002). Contracts can also reduce the monitoring and coordination costs by providing clear statements about the roles and responsibilities of exchange parties and by defining the monitoring process (Lui & Ngo, 2004; Reuer & Ariño, 2002). However, some studies argued that the efficacy of formal contracts is substantially affected by cultural and legal context. For example, North and Weingast (1989) suggested that in countries without effective legal systems, formal contracts are not reliable because it is very difficult to enforce expectations and promises. Similarly, Luo (2007) showed that in collectivistic cultures formal contracts are not effective and may signal distrust. In contrast, de Pablos (2005) showed that in individualistic cultures formal mechanisms are more effective.

Based on the above argument, I hypothesize:

H10a: *In countries where the culture is collectivistic and the contract enforceability is low, formal contract has non-significant impact on project (time&cost) performance.*

H10b: *In countries where the culture is individualistic and the contract enforceability is high, formal contract has positive impact on project (time&cost) performance.*

Based on the research hypotheses, theoretical framework was developed (Figure 3-1).

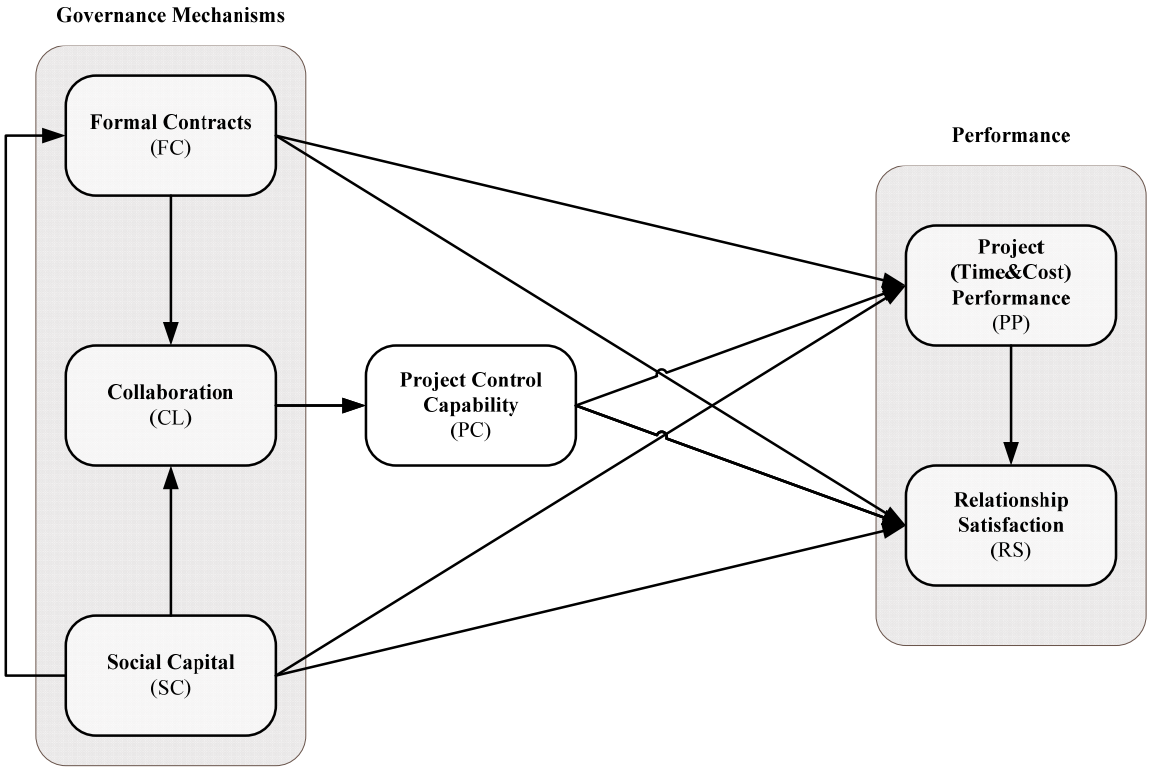

Figure 3-1 : Theoretical framework

3.4 Chapter summary

This chapter presented the research questions, and subsequently research hypotheses were developed to address the research questions. The first group of hypotheses (H1, H2, and H3) referred to the interactions between formal contract, social capital, and collaboration. The second group (H4, H5, and H6) were concerned with the interactions between governance

mechanisms and project control capability. H7a,b and H8a,b as the third group and H9a,b and H10a,b as the fourth group examined the impact of governance mechanisms on relationship satisfaction and project (time&cost) performance, respectively. Finally, according to the research hypotheses, the research framework was developed and presented.

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CHAPTER FOUR: RESEARCH DESIGN

- ***Introduction***
- ***Research process***
- ***Selecting the research design***
- ***Selecting the data collection method***
- ***Cross-sectional vs. longitudinal study***
- ***Focus of study***
- ***Sampling frame***
- ***Survey administration***
- ***Selecting the data analysis method***
- ***Chapter summary***

4.1 Introduction

This chapter describes the research design developed for this thesis. In broad terms 'research design' describes the process by which research data is collected and analyzed in order to answer the proposed questions, and to provide a framework for undertaking the research (A. Bryman & Bell, 2003).

First, inductive and deductive approaches to research are compared and the approach adopted is substantiated based on the literature and gap analysis; second, various research methods are overviewed and the comparative approach and cross-sectional survey are explained, and finally, details about the survey administration and data analysis approach using the PLS-SEM method are explained and vindicated.

4.2 Research process

Since logic and observation are two pillars of social science, any scientific explanation of the social world must make sense and conform to what we observe. These two elements link the three major aspects of social science: theory, data collection, and data analysis. Where theory communicates the logical aspect of science and provides rational explanations of the world, data collection deals with the observational aspect, and data analysis looks for potential patterns in observations and checks the conformity of logical expectations with real observations (Babbie, 2013).

Generally, there are two alternative approaches for conducting research: (1) the inductive approach, and (2) the deductive approach. As Figure 4-1 shows, the inductive

approach begins with observation and data collection and proceeds with data analysis to discover patterns of relationships between variables; this is followed by a theory to explain the relationships found among the variables. Unlike an inductive approach that begins with data collection, deductive research starts with theory from which specific hypotheses are deduced and tested by collecting and analyzing data to determine whether the theory can be supported (Babbie, Halley, Wanger, & Zaino, 2013). Put simply, "deduction can be seen as reasoning from general understandings to specific expectations, whereas induction can be seen as reasoning from specific observations to general explanations" (Babbie et al., 2013, p. 9). Given the differences between inductive and deductive approaches, the goal of both is to develop theories to better understand and explain the real world (Babbie et al., 2013).

The extent to which research is clear about its underlying theories affects the design of the research process regarding its inductive or deductive approach (Saunders, Saunders, Lewis, & Thornhill, 2009), because as Saunders et al. (2009) noted, the most important criteria a researcher uses to decide whether an inductive or deductive approach is best, is the research topic itself. For instance, a deductive approach is better suited to topics supported by a wealth of literature, from which a theoretical framework and hypotheses can be developed, whereas conducting research into a new and emerging topic without supportive literature, may better suit inductive approach beginning with observations and data collection, and then analyzing and reflecting upon what theoretical themes emanate from the data. As reviewed in previous chapters, the literature on IORs governance is conceptually and empirically rich, so a deductive approach appears to be more appropriate for this research, as well as being more manageable in view of time limitations for a PhD study and the risks associated with

concluding the research (Saunders et al., 2009). As a result, a deductive approach was adopted in this thesis and the research process was developed.

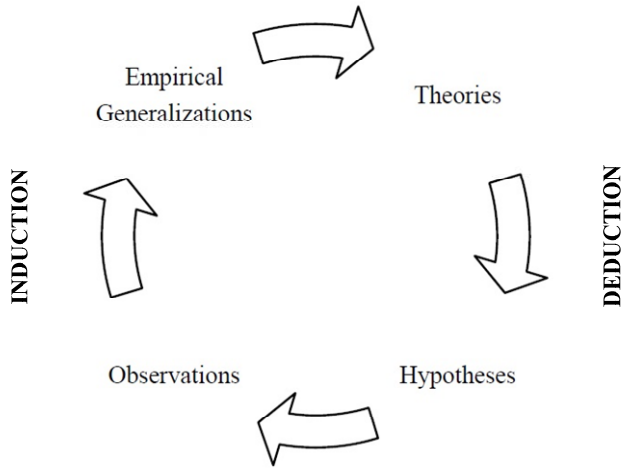

Figure 4-1 : The wheel of science (Babbie, 2013, p. 22)

To reiterate, deduction begins with theory and continues with hypothesis development, while concepts are building blocks for theories that describe the relationships between concepts. Theory development typically involves developing new constructs or identifying new relationships among constructs (Babbie et al., 2013). This study primarily focuses on the latter. Testing hypotheses is a common way to discover new relationships because hypotheses are falsifiable predictions of causal relationships between variables; that is, a well-developed hypothesis is a tentative statement that predicts changes in one or more variables due to variations in another variable. Therefore, having established the hypotheses, the next step is to design and conduct an empirical study to validate them. The research framework for this thesis is presented in Figure 4-2 and describes the steps taken from a literature review and development of hypotheses, to data analysis, discussions, and conclusions. The literature review process and development of a conceptual framework were discussed in previous

chapters. In the sections that follow, the research design and data collection steps are explained.

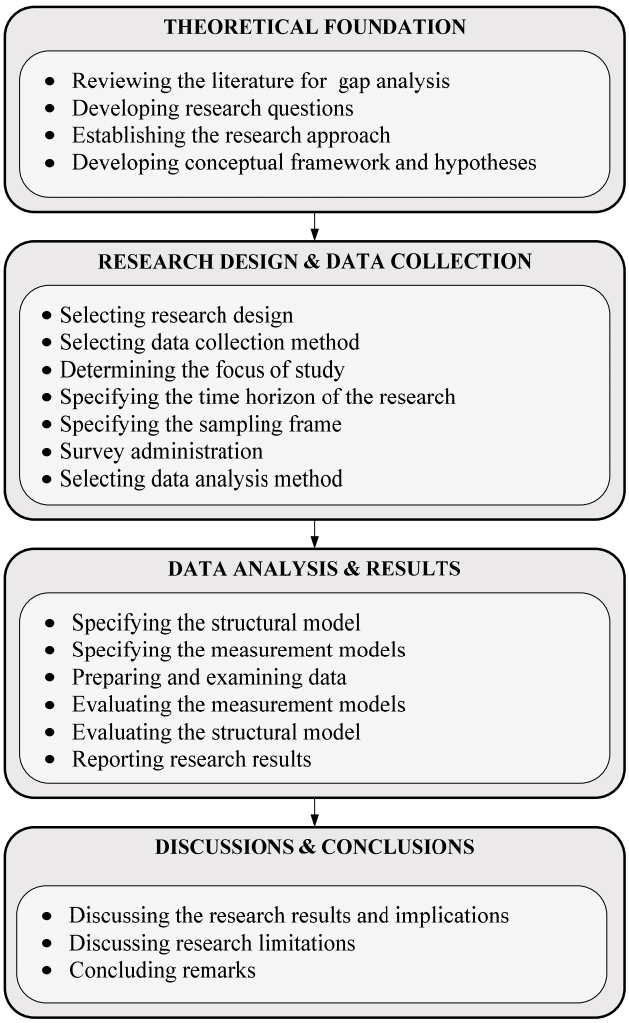

Figure 4-2 : Research process

4.3 Selecting the research design

Research design is the framework for turning research questions into a research project (Robson, 1997). As mentioned previously, how a researcher chooses to answer their research

questions depends on the approach adopted, such that, informed by the research questions, the researcher develops a plan on how to answer the questions that covers data collection and data analysis. The researcher specifies the data sources and addresses the strategies required to deal with constraints associated with the research (e.g. access to data, time, location, and money), as well as ethical issues (Saunders et al., 2009). Following Saunders et al. (2009), this study distinguished between research design and research tactics. Where the former is concerned with the overall plan of the research, the latter is concerned with the different quantitative and qualitative data collection techniques (e.g. questionnaires, interviews, historical archive analysis), and subsequent quantitative and qualitative data analysis procedures (e.g. data analysis method, bias checking, validity and reliability evaluation).

In the following paragraphs different research designs will be introduced, and reasons are given for selecting survey design over alternative options. It is important to note that no research design is inherently superior or inferior to others; the preference for a particular research design is based on how well it enables the researcher to answer their questions and meet research objectives (Saunders et al., 2009).

4.3.1 Experiment

Experimental design is the most popular method used in natural science and also have a strong association with social science research, particularly psychology (Saunders et al., 2009). Experiments are used to study patterns of causal relationships between independent and dependent variables (Hakim, 2000). In a classic experiment, one experimental group and one control group are established and members are randomly assigned to each. Both groups

should have exactly the same characteristics in all aspects relevant to the research, except for controlled factors (independent variables) that have been intentionally changed in the experimental group but which remain unchanged in the control group. The dependent variable is then measured in both groups to see if there are any significant differences between them that can be attributed to the intervention (Saunders et al., 2009). As Saunders et al. (2009) noted, experiments are often conducted in laboratories rather than in the field, and while this strategy promotes internal validity, it puts external validity at risk. The second problem with laboratory experiments is their weak link to the real world of organizations which limits the generalizations of the research findings. Field experiments follow the same process as lab experiments, but take place in a natural setting, which gives them much greater external validity despite limiting the researcher's control over the research setting and impeding accurate conclusions about causality (Flynn, Sakakibara, Schroeder, Bates, & Flynn, 1990). In addition to these weaknesses in the experimental method, preparing the experimental setting to analyze the choice and effects of governance mechanisms is very time consuming and expensive, so I did not use experiment in this study.

4.3.2 Case study

In case study research the researcher investigates a particular phenomenon within real life settings (Robson, 1997), where context is an inherent part that cannot separate the phenomenon from its context (Yin, 2009). Unlike experiments that are undertaken within a highly controlled environment, case study researchers do not manipulate the contextual factors (Saunders et al., 2009). Various data collection techniques can be used in combination with

the case study method, including interviews, observations, historical archive analysis, and questionnaire.

Case study is of particular interest to studies that are exploratory and need a deep understanding of the context of the research (Morris & Wood, 1991). As mentioned before, this is not the case in the field of IORs governance mechanisms. However, the case study method is limited by its generalization of the findings that are bounded by the cases studied (Flynn et al., 1990). For answering research questions and validating the conceptual framework proposed in this thesis, a large sample size which represents the whole population would be needed, and since case study would be too costly and time consuming, it was not selected.

4.3.3 Panel study

In a panel study, a group of experts analyze different solutions for the questions raised by a coordinator in order to reach a final agreement. Panel studies usually follow a structured process for problem solving, which is why the Delphi method is popular. Here, experts propose their solutions to a series of questions, anonymously and in writing, and then the responses are circulated among members to help them revise their answers until the group finally reaches a consensual solution (Flynn et al., 1990). As Flynn et al. (1990) noted, panel study is usually used to define terms and make predictions, which means it does not fit the research objectives of this thesis.

4.3.4 Focus group

A focus group, like a panel study, consists of a group of experts that discuss particular issues through a structured procedure to arrive at a final decision. However, unlike panel study, the group members are physically present in meetings and know each other, and group discussions are oral, not in written form. A facilitator usually leads these meetings and tries to get all the experts involved in discussions so they arrive at proper solutions for the problems raised (Flynn et al., 1990). Since focus groups match the same topics as panel studies, it too was not an appropriate method for this study's research questions.

4.3.5 Survey

Arguably, survey design is one of the most popular and common methods used in construction management research (Dainty, 2008). Surveys are usually associated with a deductive approach and are most frequently used to answer who, what, where, how much, and how many questions (Saunders et al., 2009). Survey is probably the best method available for collecting original data to study a large population (Babbie, 2013). The main reason for its popularity is its ability to collect a large amount of data from a sizeable population in a cost-efficient way and in a short time. Survey questionnaires, in particular, can increase the amount of responses by providing anonymity and privacy to the respondents. By standardizing the data gathered, it may also facilitate comparison. Furthermore, compared to other methods, its results are easy to explain and understand. Sampling makes it possible to study particular relationships between variables in a small portion of a vast population, develop models of

these relationships, and then generalize the representative models to the whole population. However, despite its noticeable advantages, survey also has some considerable disadvantages; by applying standardized questionnaire items, the data collected from a survey questionnaire is cross-sectional with little information about the dynamic relationships between variables (Saunders et al., 2009). Moreover, survey is subject to various biases such as response bias (Babbie, 2013; Alan Bryman, 2012).

Since the aim of this research is to compare the effects of governance mechanisms in client-contractor relationships within two culturally and legally contrasting contexts, this study has adopted the survey approach. As noted before, survey design is appropriate for deductive research and can generalize findings through hypothesis testing. The validity threats associated with survey design are addressed in detail in the survey administration section.

4.4 Selecting the data collection method

As discussed in the research design section, this study differentiates between research design and research tactics. While the former referred to the structure of the research, the latter is concerned with the appropriateness of techniques for collecting or analyzing research data.

As explained in the previous section, survey was selected as the research design for this study, so in this section, I overview common techniques that are usable in survey design for data collection, and then explain the logic behind choosing questionnaire as a desired technique.

4.4.1 Historical archive analysis

Unobtrusive measures, including physical traces and archives (Bouchard, 1976), are used for historical archive analysis (Flynn et al., 1990), and since the providers of the research data are not aware of observation, archival data are usually unbiased. However, having no control over the environment may limit researcher's access to the desired data set, which is why they usually use archival analysis in conjunction with survey, panel study, or case study design, to triangulate the collected data with historical factual data from respondents (Flynn et al., 1990).

In this study I collected data about the history of relationships between clients and contractors in large construction projects and the impact of different governance mechanisms on exchange performance. Since the samples in Iran and Australia were large and dispersed, and most of the data about surveyed projects were not publicly available, I did not use historical archive data.

4.4.2 Participant observation

In this method the observers become part of the working process to directly monitor the actions or interactions between participants, and collect the desired data. This technique is very effective when building theories and formulating hypotheses, because the participants are usually aware of being observed, even though their awareness may affect their behavior. Participant observation is a proper data collection technique in case study and panel study

design (Flynn et al., 1990), and since I used survey design to collect more data in the study, participant observation was not an appropriate method for this research.

4.4.3 Interviews

Dainty (2008) reported that conducting interviews was one of the most common techniques used in case studies in the construction management field because it does not mean only talking with participants and taking notes; rather, the researcher should have a specific design to conduct a structured interview without sacrificing the richness of conversations. In a structured interview the researcher prepares a script which specifies the key questions, and while they should be followed, other questions can also be asked based on the direction of the conversation (Flynn et al., 1990). By conducting face to face interviews, the researcher can be confident about the response rate and also mitigate the risk of having too many unanswered questions and missing values. Interviews are effective and suitable ways to study complicated research subjects that require thorough consideration and deep analysis or need clarification of the questions or terminologies used. Moreover, interviewers can observe the respondents' behavior during Q&A that may help them to understand the context and refine their questions to obtain the best answer(s). This observation can also contribute to the research by providing some contextual information (Babbie, 2013). Despite the benefits of this technique, the drawbacks are also considerable. For example, it would be very costly and time consuming to collect data through interviews if the research needs to treat a large sample; so too would having to transfer interviews to manuscripts and find patterns of data in the text. Therefore,

the best option for using the interview technique is within case study design that deals with limited cases and individuals which is not the case in this research.

4.4.4 Questionnaires

As Dainty (2008) reported, questionnaire has been one of the most popular data collection techniques in the construction management field. Indeed, self-administered questionnaires are generally faster and more cost efficient than face to face interviews, which makes it an ideal method for a research student with limitations in time and budget. Moreover, unlike other methods such as observations or interviews which need the researcher to be present at the site, a questionnaire survey at the national or even cross-national level can be undertaken at about the same costs as a local survey without taking a trip or even making a call. Moreover, it needs less administrative work, takes less time, and requires fewer staff members. Furthermore, respondents sometimes feel uncomfortable having to respond to controversial or personal questions in interviews, but are happy to fill in an anonymous self-administered questionnaire (Babbie, 2013).

For these reasons, questionnaire is the preferred method for collecting cross-national data within Iran and Australia. In addition, there is a large body of literature on IORs governance with sophisticated definitions of key constructs and validated instruments for measuring the constructs, and therefore the questionnaire survey was used to collect field data to test the hypotheses developed in the previous chapter.

4.5 Cross-sectional vs. longitudinal study

So far I have addressed the research design and the research method, and I will now establish the framework of my research by considering the two time related options that are available, i.e., a cross-sectional study or a longitudinal study.

In cross-sectional studies a researcher samples a population at one point in time, whereas in longitudinal studies, sampling is extended over period of time or multiple snapshots of the time. Although longitudinal study is the best way to study changes over time, it is more difficult for quantitative studies such as large scale surveys (Babbie, 2013). O'Sullivan and Rassel (1994) argued that cross-sectional studies are better for collecting data on many variables, from a large group of subjects, and from subjects which are geographically dispersed.

A longitudinal study of large samples of construction projects requires resources and time commitments beyond my PhD study, so due to the limitations associated with PhD research in terms of time, cost, and scope of the study, I conducted a cross-sectional study.

4.6 Focus of study

Cross-cultural studies are becoming increasingly important in different disciplines, particularly in the field of construction management (Chan & Tse, 2003). These studies generally have two main purposes: (1) to extend the generalization of implications across borders, and (2) to identify cultural differences regarding phenomena and relationships (Hult et al., 2008; Mintu, Calantone, & Gassenheimer, 1995). Although scholars such as Marsh

(1967) believe that comparative sociology should be considered as a separate field because its data and objectives are different from studies that focus on a single society, others argue that comparison is a generic aspect of human thought and has nothing to do with research methodology (Lewis, 1955; Neuman, 2000; Warwick & Osherson, 1973). They believe the only thing that differs between the comparative and non-comparative wings of social science is the range of variations considered in each view, or the types of problems addressed.

By its very nature, comparison is the process of finding and studying similarities and differences among phenomena (Warwick & Osherson, 1973). As explained by Warwick and Osherson (1973), a comparative approach refers to social scientific analyses where observations are extended to more than one social system, or in the same social system at more than one point in time. Unlike single-study research that analyzes differences between different cases while explaining the covariation of one variable with another, comparative research examines patterns of similarities and differences across cases in different social contexts and tries to come to terms with their diversity (Neuman, 2000; Ragin, 1987).

A comparative study may also reveal weaknesses in research design and can improve its quality by improving measurement and conceptualization by incorporating several viewpoints from different social contexts and various cultures. Hidden biases, assumptions, and values can be discovered by considering a wider range of events or behavior in multi-cultural settings. Moreover, it can change or give alternative explanations for causal relationships, indeed, through comparative research, new questions may also be raised that lead to new theory building (Neuman, 2000).

Despite these advantages, comparative studies do have some disadvantages: it is more difficult, more costly, and more time consuming than non-comparative research, and it has problems with the types of data that can be collected and the equivalency of collected data (Neuman, 2000).

Kohn (1987) identified four types of comparative research, that included: (1) case-study comparative research, (2) cultural-context research, (3) cross-national research, and (4) transactional research.

In case-study comparative research, the idea is to compare particular societies or cultures, but not for broad generalizations, where the researcher examines a small number of cases in depth, in order to identify trivial differences (Ragin, 1987). Another type of comparative research is cultural-context research where the researcher studies cases that represent particular types of societies or cultural units (Neuman, 2000). In yet another type of comparative research the nation is the unit of analysis and variations in unique features across nations are measured. Cross-national researchers need to study at least 30 nations for the purpose of statistical analysis. The final form of comparative research is transactional research where the focus moves from isolated units to multi-nation units, as blocs of nations.

In this study, the efficacy of different governance mechanisms in two culturally and legally different environments is examined and the results are compared to determine whether these contextual factors make any difference. For that reason, the second comparative design—cultural-context research—was used to study two sets of data from two different countries, representing countries with individualistic/collectivistic cultures and high/low

contract enforceability. This comparative study provided the opportunity to find similarities and differences in two contexts.

4.7 Sampling frame

In this part the reasons for choosing the research cases, unit of analysis and survey respondents are introduced.

4.7.1 Case selection

As discussed in previous chapters, one of the objectives of this research is to examine the impact of individualistic/collectivistic cultures and contract enforceability on the choice and effects of governance mechanisms. To achieve this objective, this study analyzed the contributions made by various governance mechanisms on exchange performance in two culturally and legally diverse environments.

Regarding culture, while Iran has an IDV of 41 and is considered to be a collectivistic society, Australia, with an IDV of 90, is recognized as a highly individualistic culture (Hofstede, 2001; Hofstede et al., 2010). With regard to the contract enforceability, I used World Bank's data on WGI. According to the data for the period between 2002 and 2012, Iran's average score on the 'rule of law' was 23, and the average score for Australia was 96 (Kaufmann, Kraay, & Mastruzzi, 2013) which means these cases represent two contrasting contexts as far as their cultural and legal characteristics are concerned. Furthermore, replicating the survey in two distinct institutional contexts reduces the risk of random test and

provides an opportunity to investigate the boundary conditions and the ability to generalize the findings (Hubbard, Vetter, & Little, 1998; Sakhdari, 2014). Finally, since I, as the researcher, was studying in Australia and my home country is Iran, 'convenience' and 'familiarity' were two other reasons for selecting Iran and Australia as research cases (Yin, 2009).

4.7.2 Unit of analysis

The unit of analysis refers to the basic unit which is examined within the sample to create a summary description of all such units, and to explain variations between them (Babbie, 2013). Depending on the research questions, individuals, groups, organizations, projects, or social interactions can be used as the unit of analysis (Babbie, 2013; Flynn et al., 1990). The unit of analysis in IORs governance studies are generally inter-organizational relationships between exchange partners (Woolthuis, Hillebrand, & Nooteboom, 2005), because all the transactions occur in bi-lateral relationships and contractual and relational governance mechanisms are applied to regulate these relationships. However, the choice of governance arrangements not only depend on the history of relationships between exchange partners, it is also motivated by characteristics of transactions (Granovetter, 1985; Uzzi, 1997; Williamson, 1979). Since this study has set out to analyze the choice and effects of governance mechanisms in regulating client-contractor relationships in large construction projects, the client-contractor relationships embedded in projects are the units of analysis. In this study large construction projects were treated as sets of transactions (Pryke & Pearson, 2006) to identify the effects of governance mechanisms on project performance.

4.7.3 Selection of survey respondents

To collect data large construction contractors were approached because: (1) Contractors play a key role in large construction projects (Eccles, 1981) and as a result are more focused on the project, (2) Clients in large construction projects are generally publicly owned and are not as professional at project business as the contractors, (3) Contractor companies are more identifiable and approachable, (4) Regarding the sampling issue, there are more public data available about the population of contractor companies, and (5) Since large construction companies usually undertake large construction projects, there is more chance to acquire data about large construction projects.

To identify a sample of large construction contractors in Iran, government directories of construction companies in five branches of the construction industry, including Building, Water, Transportation, Power, and Oil & Gas were analyzed. Since the focus of this study was on large construction projects, the sample was limited to contractors that hold tier 1 and tier 2 grades in the fields mentioned previously. In these fields there are generally 5 professional grades, with each contractor starting from level 5, and with specific limitations on the size and number of projects they are allowed to undertake, after which they can apply for higher levels based on their increased capabilities and records of project implementation. Holders of tier 1 and tier 2 grades are very large companies usually able to handle mega projects. Based on the government database, there were 365 construction contractors holding tier 1 or tier 2 grades in the nominated fields, so they were selected as samples from Iran.

In Australia, contractors were sampled based on two popular listings of top construction companies; namely the Australian Constructors Association (ACA) and Australian Industry Group. Accordingly, 56 companies and their state subsidiaries (241 in total) were selected for data collection.

To obtain the data required executive/project managers in the nominated companies were approached. The respondents should have been involved in large construction projects, but to ensure they were knowledgeable about project and relationship characteristics, I included guidelines in the questionnaire explaining the conditions for taking part (See Appendix C). The respondents were requested to provide data about a recently completed construction project (completed during last 3 years or with at least 80% progress to date) with a total contract value of more than AU$5 M.

In the following section, the process undertaken for survey administration is explained.

4.8 Survey Administration

There were two consecutive phases through which questionnaire survey was conducted and data was collected: (1) survey preparation, and (2) survey implementation. The following paragraphs describe the process through which these two phases were implemented in this study.

4.8.1 Survey preparation

To collect data, a structured questionnaire was designed based on a review of previous empirical studies to capture the perception of practitioners with experience in large construction projects.

4.8.1.1 Measurement considerations

Measurement is an underlying concept in conducting a questionnaire survey. Basically, measurement is the process of allocating numbers to a variable based on a set of rules (Hair, Celsi, Money, Samouel, & Page, 2011; Hair, Hult, Ringle, & Sarstedt, 2014). To measure a concept (often referred to as an operational definition) it is necessary to have an indicator or indicators that represent the concept (Alan Bryman, 2012). Although operationalization is very straightforward for some concepts such as age or level of education, it is much more difficult for variables such as trust or performance, so where the concept is abstract, complex, and not directly observable, latent (unobservable) variables or constructs are applied (Hair et al., 2014). Latent variables are theoretical creations based on observations that cannot be observed directly or indirectly and must be inferred from measurable or observable indicators (manifest variables) (Babbie, 2013; Polites, Roberts, & Thatcher, 2012). Each of these indicators that serve as proxy variables would represent a single separate aspect of a larger abstract concept (Hair et al., 2014).

The conceptual model presented in the previous chapter (Figure 3–1) consists of latent variables such as Formal Contract (FC), Social Capital (SC), Collaboration (CL), Project

Control Capability (PC), Project (time&cost) Performance (PP), Relationship Satisfaction (RS), and Project Size (PS). As advised by Diamantopoulos, Sarstedt, Fuchs, Wilczynski, and Kaiser (2012), all the main constructs in this study were measured using multiple items (as opposed to single-item measures). In such cases, several measures of multiple items were combined to form a single composite score for the latent variable. Using several individual indicators to measure an abstract concept made it more likely to capture all the different aspects of the concept, so the measure would be more accurate (Hair et al., 2014). That is, it reduced measurement error which is the difference between the true value of a variable and the value obtained by a measurement. This form of design accommodates the research approach by allowing constructs to be represented by a combination of variables that can be measured.

The second issue in developing a measurement instrument is the measurement scale. A measurement scale is "a tool with a predetermined number of closed-ended responses that can be used to obtain an answer to a question" (Hair et al., 2014, p. 7). Measurement scales are categorized into four different types, including nominal, ordinal, interval, and ratio. Each of these scales represents a different level of measurement (Babbie et al., 2013; Hair et al., 2014). Nominal scales are the lowest level of scales because they restrict the analysis options by assigning names or numbers to variables that enable us to identify or classify those variables (e.g. industries, companies, people, etc.). These scales can be composed of several categories, but they should all be mutually exclusive. The ordinal scale is the next higher level of scale that arranges attributes of variables in some order: from low to high, from more to less, and so on, with the result being they add the quality of rank ordering to the measured variables

(Babbie et al., 2013). However, these ranked values are not based on equal differences between variables, so the means or variances for ordinal data cannot be calculated. The interval scale is the next measurement scale, and it not only gives the same ranking capability as an ordinal scale, it also provides precise information on the distances between the attributes of variables by capturing the differences in values. This precision in distances is necessary for having so-called 'equidistance' scales that are needed for certain analysis techniques such as structural equation modeling (SEM) (Hair et al., 2014). Although interval scale enables the researcher to carry out almost any type of mathematical computations, including the mean and standard deviation, it does not provide the absolute zero point, and therefore the value of zero in an interval scale does not mean there is no value (Mooi & Sarstedt, 2011). To include this information in measurement, the ratio scale should be used that is at the highest level of measurement (Hair et al., 2014).

After choosing the scales to measure the indicators and constructs, the next thing that should become clear is the coding style. Coding is about assigning numbers to categories in a way that facilitates measurement (Hair et al., 2014). Coding is a critical issue in the application of multivariate analysis; for instance when Likert scales (which are very popular in questionnaire surveys) are used in a research, it is necessary to code the categories so they are symmetric and equidistant. After fulfilling this requirement the outcome values can be treated as the results of interval scale. This means that while the Likert scale is ordinal, it can approximate an interval-level measurement and the corresponding variables can be used in multivariate analysis (Hair et al., 2014).

The measurement scale and coding style applied in this study are described in the following paragraphs. The next part also shows the construction of the designed questionnaire.

4.8.1.2 Questionnaire construction

The questionnaire consists of several sections. In section one, the respondents were asked to give some general information about the project such as the project field, total planned budget, and total planned duration. The project field was defined as a nominal variable and the respondents were given five categories of projects, including building, water, transportation, power, and oil & gas to assign the nominated project to the most relevant field. The total planned budget and total planned duration were defined as ordinal variables. The defined order for total planned budget was: AUD5-10, AUD10-50, AUD50-100, AUD100-500, AUD500-1000, and More than AUD1000. Similarly, the order for total planned duration was defined as: Less than 12 months, 12-18 months, 18-24 months, 24-36 months, 36-48 months, and more than 48 months. The total planned budget and total planned duration were used as two indicators of the Project Size (PS). PS was used as a control variable in the model. PC was measured by seven items from which 5 items were adopted from Kirsch et al. (2010) and 2 items were developed as new scales. All the items related to PC construct were defined as ordinal variables to arrange different attributes of the construct in order. These items were rated on a seven point Likert scale (1= Strongly disagree, 7= Strongly agree).

In the second section, respondents were asked to describe the social ties embedded within the client-contractor relationships. Social Capital (SC) was used as a second-order construct that consisted of Prior Ties (PT), Shared Norms (SN), and Trust (TR). This construct

reflected the level of social capital between partners that had accumulated by recurring interactions through past collaborations. PT was measured by two indicators adopted from Zhang et al. (2009), that reflected previous collaborations between partners. SN was measured by three indicators adopted from the work of Y. Li et al. (2010), that reflected the extent of shared goals and values among partners. To measure TR, three items were obtained from Şengün and Wasti (2009) that showed the extent to which past collaborations convinced the firm to believe that its partner was honest and benevolent (Kumar, Scheer, & Steenkamp, 1995). As with items in the previous section, the items included in SC were defined as ordinal variables and were rated on a seven point Likert scale (1= Strongly disagree, 7= Strongly agree).

The third section of the questionnaire was devoted to measuring the degree to which contractual and relational governance mechanisms were used to regulate client-contractor relationships within the current project. Collaboration (CL) was operationalized using six items adopted from Selnes and Sallis (2003), Zhang et al. (2009),Yang et al. (2011), and Luo et al. (2011). This construct refers to the mechanisms that were deployed in the current project to enrich relational ties and promote a trusting environment between the partners. The next construct measured in this section of the questionnaire was FC that referred to the legal bonds established within partners' relationships to specify the responsibilities and rights of both parties and consider contingencies that might emerge in the future. To measure the reliance of parties on Formal Contract (FC), five items were obtained from Zhang et al. (2009) and Y. Li et al. (2010). The questions in this section were also defined as ordinal variables and rated on a seven point Likert scale (1= Strongly disagree, 7= Strongly agree).

In the fourth section of the questionnaire, exchange performance was measured. Following Lui and Ngo (2004) and Jin et al. (2007), this study differentiated between Project (time&cost) Performance (PP) and Relationship Satisfaction (RS) because where the former referred the extent to which the project was successfully implemented and met its planned time and cost objectives, the latter measured the partners' satisfaction with their cooperation and their hope for future collaborations. RS was operationalized using four items adopted from Saxton (1997), while the indicators were defined as ordinal variables and rated on a seven point Likert scale (1= Strongly disagree, 7= Strongly agree). To measure PP, two types of questions were developed; in the first the respondents were asked to rate the time and cost performance of the project compared to similar projects in the field. These questions were rated on a seven point Likert scale (1= Very poor to 7= Excellent). In the second part the respondents were asked to choose whether the project had been progressed, or finished ahead of schedule, on schedule, or behind schedule. For this question, a nine point Likert scale was used (1= Behind the schedule (+100%), 2= Behind the schedule (50%-100%), 3= Behind the schedule (25%-50%), 4= Behind the schedule (0-25%), 5= On schedule, 6= Ahead of schedule (0-25%), 7= Ahead of schedule (25%-50%), 8= Ahead of schedule (50%-100%), 9= Ahead of schedule (+100%)). Similarly, they should declare the cost performance of the project by specifying whether the final cost of the project was below the planned budget, on budget, or above the budget. This item was also measured by a nine-point Likert scale (1= Above the budget (+100%), 2= Above the budget (50%-100%), 3= Above the budget (25%-50%), 4= Above the budget (0-25%), 5= On-budget, 6= Below the budget (0-25%), 7= Below the budget (25%-50%), 8= Below the budget (50%-100%), 9= Below the budget (+100%)).

The final section of the questionnaire asks about some background information of the respondents such as their designation in the company or project, their experience in the construction industry, their age, and their level of education. A summary of the measured items is listed in Table 4-1.

Table 4-1 : Measurement items

Constructs and indicators	Source
Project Control Capability (PC):	
PC1: It was possible to check the project team's progress towards project goals through formal reviews and reports.	(Kirsch et al., 2010)
PC2: It was possible to monitor how well the project team was meeting project goals.	
PC3: It was possible for us to determine whether the project team built a product (or deliverable) that satisfied the users' requirements.	
PC4: There were quantifiable measures of the extent to which project cost targets were achieved.	
PC5: It was possible for us to determine whether the project team completed the project work on time.	
PC6: There was a well-understood way to carry out project tasks.	New scale
PC7: The project team had substantive experience with this type of project.	
Social Capital (SC):	
Prior Ties (PT)	(Zhang et al., 2009)
PT1: Before this project, we had extensive collaboration with this partner on other projects.	
PT2: It has always been pleasant during our collaboration.	
Shared Norms (SN)	(Y. Li et al., 2010),
SN1: Both organisations had a mutual understanding of each others organisational culture, values, and operations.	
SN2: Both organisations had a common vision and ambition for the cooperative venture.	
SN3: A comprehensive set of norms of action was well developed in the cooperation.	
Trust (TR)	(Şengün & Wasti, 2009)
TR1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	
TR2: During our previous collaborations, this partner has been an excellent source of accurate information.	
TR3: During our previous collaborations, this partner has been reliable.	
Collaboration (CL):	(Luo et al., 2011), (Selnes & Sallis, 2003), (Yang et al., 2011), (Zhang et al., 2009)
CL1: The two sides exchanged information on changes related to organisations' strategies and policies.	
CL2: The two sides exchanged information on successful and unsuccessful experiences.	
CL3: The two sides have been communicating with each other via frequent interaction and informal socialization.	
CL4: The two sides agreed to effectively do things for each other.	
CL5: The two sides agreed to work together to resolve the problems caused by whichever party.	
CL6: The two sides have been communicating with each other about events and changes that would affect collaboration.	
Formal Contracts (FC):	(Y. Li et al., 2010), (Zhang et al., 2009)
FC1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	
FC2: In our contract with our partner we defined project targets in detail.	
FC3: There were well-specified responsibilities and rights for each partner.	
FC4: There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	
FC5: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	

Table 4-1 : Measurement items (Cont.)

Constructs and indicators	Source
Relationship Satisfaction (RS): RS1: This cooperation contributed to our core competencies and competitive advantage. RS2: This cooperation realised the objectives we set out to achieve. RS3: This cooperation improved our relationship and increased the likelihood of working together in the future. RS4: Overall, we were satisfied with the performance of this cooperation.	(Saxton, 1997)
Project (time&cost) Performance (PP): PP1: Project time performance (comparing to similar projects in the field) PP2. Project cost performance (comparing to similar projects in the field) PP3: Project time performance against the planned schedule PP4: Project cost performance against the planned budget	-
Project Size (PS): PS1: Total planned budget (Million AUD) PS2: Total planned duration (Months)	-

4.8.1.3 Translation procedure

One of the key challenges that researchers must address with cross-national studies is data equivalency among different cultures (T. Peng, Peterson, & Shyi, 1991), that is, when developing instruments to measure indicators, several types of equivalences should be considered, such as vocabulary, or a translation that is equivalent to the original language in which the instrument was developed, idiomatic equivalence which could become a serious problem when some idioms unique to one language cannot be translated into other languages, grammatical and syntactical equivalence, which is especially important when translating long passages, or the inferences drawn by respondents in various cultures from a given statement, and finally, conceptual equivalence where the meaning of certain concepts such as love may differ in different cultures (Sekaran, 1983).

As Sekaran (1983) argued, every type of equivalence mentioned generally refers to 'the equivalence of source and target versions of the instrument, and usually can be ensured with

good back translations by persons who are not only facile with the different languages in question but are also familiar with the cultures involved, and with the usage of the concepts and their meanings in the relevant cultures'.

Accordingly, an English version of the questionnaire was developed first, translated into Persian and then translated back into English, according to the steps suggested by Brislin (1970) and Sekaran (1983). The back translated English version was then checked against the original English version, which was evaluated item by item for clarity, specificity, and representativeness. Some questions in the Persian version were reworded to improve the accuracy of the translation.

4.8.1.4 Pilot testing

Even carefully designed questionnaires can contain ambiguous or wrong questions, or other types of errors (Babbie, 2013), so a pilot study was carried out before conducting the main survey (Krosnick, 1999). Accordingly, the Persian and English versions of the questionnaire were distributed to 14 people, of whom 7 were asked to complete the Persian version and comment on it, while the others commented on the English version. These people were a selection of university professors, construction industry practitioners, and fellow PhD students from Sydney University and The University of New South Wales (UNSW). Based on feedback from the pilot study, some minor modifications and changes were made to the questionnaire and then the final draft was prepared.

4.8.1.5 Considering ethical issues

Ethics and the role of values in the research process are critical issues in social research that must be addressed. The main concerns in this respect are as follows (Alan Bryman, 2012):

- How should we treat the people with whom we conduct research?
- Are there activities in which we should or should not engage in our relations with them?

To address these concerns, Diener and Crandall (1978) specified four main areas that social researchers must consider:

1. Whether the participants will be harmed;
2. Whether there is lack of informed consent;
3. Whether there is an invasion of privacy;
4. Whether deception is involved.

Since this research was conducted at the University of Sydney, the university rules were followed regarding these concerns. After preparing the English and Persian versions of the questionnaire, an application process was undertaken via integrated research management application (IRMA) system to obtain ethical approval. After fulfilling the requirements raised by the review committee, final approvals of English and Persian versions were received by May 20, 2013 and October 23, 2013, respectively. Based on the rules, three sections were added to the beginning of the questionnaire: (1) a participation information statement; (2) a questionnaire guideline; and (3) a participant consent form. In the first part, the research study and the researchers were introduced, including information such as the estimated time to answer the questions, how to withdraw from the study, its potential benefits, and contact

information of the researchers and the university's Human Ethics Administration office. In the second part, key terms used in the questionnaire and some guidelines for answering the questions were introduced. The third part laid out the rights of participants and contained a requested for consent to participate in this research project. Finally, a covering letter explaining the research objectives and assuring confidentiality and access to the summary of our aggregated survey results was developed to be posted with the questionnaires to the construction companies.

4.8.2 Survey implementation

Data used in this study were extracted from a survey conducted between May 2013 and February 2014 in Australia and Iran. There are three main methods for implementing survey questionnaires (Babbie, 2013):

1. A self-administered questionnaire where respondents are required to answer the questions on their own;
2. Surveys administered by interviewers through face-to-face meetings;
3. Telephone survey.

A self-administered survey was adopted in this study because it was faster and more cost effective for such a cross-national study with budget and time limitations.

Since the researcher was in Australia, two people were appointed in Iran as research assistants to distribute the questionnaires, follow up the respondents, collect the completed questionnaires, carry out data entry, and send all the data to the researcher. First, all the information previously acquired from 365 construction contractors (e.g. email address,

telephone number, postal address), including the Persian version of the questionnaire, was sent to the research assistants, and then the research topic and procedure for implementing the mail survey was explained to research assistants. The research assistants then printed 365 copies of the questionnaires and cover letters, and posted them accompanied with reply paid envelopes to the managing directors of the nominated companies. In the cover letter, the research objectives and confidentiality of responses were explained and managing directors of the companies were asked to complete the questionnaires themselves or to ask one of their executive managers/project managers to complete them. After sending out three reminders (e.g. telephone calls, emails), 95 questionnaires were returned, of which 84 were valid and complete, giving a response rate of 23%. To make sure that there was no duplicated data, the project characteristics in data sets, including the size of the company, project field, and planned budget and duration, as well as time and cost performance of the project were checked and no duplications were found.

The same processes took place in Australia, where 241 questionnaires were sent to 56 companies and their state subsidiaries. 49 questionnaires were returned, of which 42 were complete. Each questionnaire was checked for duplication, and data on two projects appeared to be identical, and indeed, it was found that data had been provided by the project director and project manager for the same project; consequently, the data received from the project director was kept, whilst the other was removed from the database. No other identical characteristics were found in collected dataset, which confirmed there were no repeated projects. As a result, 41 unique responses remained for further analysis, giving a response rate of 17%.

The response rate from both countries was reasonable compared to the normal rate in construction industry (Li, Akintoye, Edwards, & Hardcastle, 2005; Ning, Yean, & Ling, 2013) and also for surveys mailed to top managers (Hambrick, Geletkanycz, & Fredrickson, 1993; Lui, 2009). Although the responses were relatively low in Australia, a statistical analysis could still be performed based on the central limit theorem that holds true if the sample size is more than 30 (Field, 2013; Ott & Longnecker, 2001).

Table 4-2 summarizes the respondents' background and shows that 69% of respondents came from the Iranian sample and 78% of respondents in the Australian sample were from top managers from construction companies or in projects. The data also indicated that more than 80% of the respondents in both samples were highly experienced (with more than 10 years working experience in the construction industry).

Table 4-3 is a profile of the projects surveyed in Iran and Australia, and shows that in both samples, the planned budget in about one third of the projects exceeded AU$100 million.

Table 4-2 : A summary of respondents' background information

Profile items		Iran		Australia	
		Number	%	Number	%
Designation of respondent	- Company top managers (e.g. managing director, general manager, state manager)	31	37	4	10
	- Company middle managers (e.g. business support manager, commercial manager)	14	17	4	10
	- Project top managers (e.g. project director, project manager, construction manager, site manager)	27	32	28	68
	- Project middle managers (e.g. project engineer, project risk manager, earthworks construction manager)	6	7	4	10
	- Not specified	6	7	1	2
Experience (years)	< 5	3	4	2	5
	5-10	10	12	6	15
	10-20	33	39	7	17
	20-30	25	30	14	34
	> 30	13	15	12	29
Age (years)	25-30	3	4	3	7
	30-40	31	37	7	17
	40-50	23	27	15	37
	50-60	17	20	14	34
	> 60	10	12	2	5
Education	High school	0	0	1	2
	Diploma	1	1	6	15
	Bachelor	39	47	23	56
	Masters/ Honors	36	43	10	24
	PhD	7	8	1	2
	Not Specified	1	1	0	0

Table 4-3 : Profile of the surveyed projects

		Iran		Australia	
		Number	%	Number	%
Field	Building	24	28	22	54
	Water	8	10	7	17
	Transportation	17	20	8	19
	Power	8	10	0	0
	Oil & Gas	27	32	2	5
	Others	0	0	2	5
Planned budget (Million AUD)	5-10	18	21	7	17
	10-50	38	45	14	34
	50-100	5	6	3	7
	100-500	13	16	11	27
	500-1000	5	6	4	10
	> 1000	5	6	2	5
Planned duration (Months)	< 12	5	6	4	10
	12-18	16	19	12	29
	18-24	23	27	13	32
	24-36	23	27	5	12
	36-48	8	10	3	7
	> 48	9	11	4	10

4.8.2.1 Considering the non-response bias

As Armstrong and Overton (1977) recommended, a potential non-response bias was assessed by analyzing the equality of variances and the means of two representative indicators, i.e., the age of the company and the field of the nominated project between early and late responses. Accordingly, the data from each country was split into two parts based on the response date. For instance, in the Australian case, the first and last questionnaires were received on May 27, 2013 and January 27, 2014, so all the data received in first four months were coded as 1 and later responses were coded as 2, after which an independent t-test was carried out in SPSS Software version 21. As Field (2013) explained, Leven's test was to analyze whether the variances were different in various groups, so if the Leven's test was not significant at $p>0.05$, an assumption about the homogeneity of variances in two groups was approved, otherwise this assumption was violated. In former conditions ($p>0.05$), the test statistics from the row labeled *Equal variances assumed* should be read, whereas, in later situations, the row labeled *Equal variances not assumed* would be considered to check the equality of means. Consequently, the two-tailed values of p should be checked for equality of means. That is, if the p value was greater than 0.05, there was no significant difference between the means of the two groups and as a result, there was no bias in the responses (Field, 2013).

Table 4-4 through Table 4-7 show the results for the Iranian and Australian samples; Table 4-6 and Table 4-7 indicate that Leven's tests and t-tests for the samples in Iran and Australia found no significant difference between the two groups (early and late respondents), suggesting there was almost no threat of a non-response bias.

Table 4-4 :Group statistics for early and late respondents (Iran)

	Response date	N	Mean	Std. Deviation	Std. Error Mean
AGE	1.00	65	4.3538	1.06699	.13234
	2.00	19	4.3684	1.30002	.29825
FLD	1.00	65	2.9846	1.59582	.19794
	2.00	19	3.6384	1.73879	.39891

Table 4-5 : Group statistics for early and late respondents (Australia)

	Response date	N	Mean	Std. Deviation	Std. Error Mean
AGE	1.00	25	4.6000	1.11803	.22361
	2.00	16	4.8667	.51640	.13333
FLD	1.00	25	2.0000	1.22474	.24495
	2.00	16	1.5000	.81650	.20412

Table 4-6 : Independent sample test for considering non-response bias (Iran)

		Leven's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
AGE	Equal variances assumed	.102	.750	-.050	82	.960	-.01457	.29269	-.59684	.56769
	Equal variances not assumed			-.045	25.508	.965	-.01457	.32629	-.68590	.65675
FLD	Equal variances assumed	.731	.395	-.904	82	.369	-.38381	.42465	-1.22858	.46097
	Equal variances not assumed			-.862	27.486	.396	-.38381	.44531	-1.29676	.52915

Table 4-7 : Independent sample test for considering non-response bias (Australia)

		Leven's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
AGE	Equal variances assumed	2.964	.093	-.867	38	.392	-.26667	.30772	-.88961	.35627
	Equal variances not assumed			-1.024	36.246	.312	-.26667	.26034	-.79454	.26121
FLD	Equal variances assumed	1.835	.183	1.438	39	.158	.50000	.34770	-.20330	1.20330
	Equal variances not assumed			1.568	38.895	.125	.50000	.31885	-.14499	1.14499

4.9 Selecting the Data Analysis Method

This section describes the methods used to analyze the survey data; different analytical methods are reviewed and then the reasons for adopting PLS-SEM is given, followed by an explanation of the systematic procedure used to conduct PLS-SEM.

4.9.1 Multivariate analysis methods

There are two general categories of statistical methods for analyzing the relationships between multiple variables, namely first generation and second generation techniques (Fornell, 1982; Haenlein & Kaplan, 2004; Hair et al., 2014). Although first generation techniques have been the dominant tools used by social science scholars to develop and confirm their research findings (Fornell, 1982), since the early 1990s second generation methods have increasingly been applied. This increase has been very significant in some disciplines because almost 50% of empirical studies have applied these methods for statistical analysis (Hair et al., 2014). Scholars have increasingly been turning to second generation techniques to overcome the weaknesses of first generation methods. As Table 4-8 shows, first generation methods not only include approaches such as multiple regression, logistical regression, and analysis of variance, they also embrace techniques such as exploratory factor analysis, cluster analysis, and multi-dimensional scaling. These statistical analysis methods can be applied to both exploratory and confirmatory studies, that is, they can be used as confirmatory tools to test the hypotheses of existing theories and concepts, and to exploratory

research where there is little or no prior knowledge of the relationships between variables and the researcher is looking for latent patterns of relationships in the data (Hair et al., 2014).

Table 4-8 : Classification of multivariate methods

First-generation techniques	Second-generation techniques
• Cluster analysis • Exploratory factor analysis • Multidimensional scaling • Analysis of variance • Logistic regression • Multiple regression	• Confirmatory factor analysis • CB-SEM • PLS-SEM

Despite these capabilities, first generation methods have three limitations (Haenlein & Kaplan, 2004):

1. The postulation of a simple model structure (at least in the case of regression-based approaches);
2. The assumption that all variables can be considered as observable (not able to manage latent variables measured indirectly by indicator variables);
3. The conjecture that all variables are measured without error, which may limit their applicability in some research situations.

Regarding the first limitation, Jacoby (1978, p. 91) stated that "we live in a complex, multivariate world [and that] studying the impact of one of two variables in isolation, would seem … relatively artificial and inconsequential". Although building a research model is always associated with ignoring some aspect of reality (Shugan, 2002), regression-based assumptions may be too limiting for an analysis within more complex and more realistic situations (Haenlein & Kaplan, 2004). This limitation would be more critical when researchers look for mediation or moderation effects of one or more variables on the relationships between

dependent and independent variables because it may result in finding some dependent variables influencing other dependent variables (Haenlein & Kaplan, 2004).

With respect to the assumption of first-order methods about the observability of all variables, McDonald (1996, p. 239) emphasized that a variable can be called observable "if and only if its value can be obtained by means of a real-world sampling experiment". Accordingly, any variable that cannot be represented by an observable object must be considered as unobservable (Babbie, 2013; Dijkstra, 1983). Therefore, it is obvious that only a handful of variables (e.g. age, gender) can be observed directly and can be considered as observable variables, whereas the effects and properties of some concepts such as trust, performance, or satisfaction are usually observed only indirectly through other observable variables (Babbie, 2013; Haenlein & Kaplan, 2004).

The third assumption with first-generation methods was about ignoring errors when measuring variables, but when considering different types of errors associated with each observation within the real world, this conjecture appears to be unrealistic. According to Bagozzi, Yi, and Phillips (1991), each observation in this world is accompanied by at least two types of errors, namely, random error and systematic error. While random error is usually caused by the order of items in a questionnaire or respondent fatigue (Heeler & Ray, 1972), systematic error originates from biases in measurement (e.g. method variance in which variance is attributed to the measurement method rather than the construct of interest) (Bagozzi et al., 1991).

Consequently, structural equation modeling (SEM) techniques have been introduced as second generation methods to overcome these limitations. SEM techniques can

simultaneously model relationships between multiple independent and dependent constructs (Gefen, Straub, & Boudreau, 2000; Haenlein & Kaplan, 2004). As a result, SEM terminology no longer uses the terms dependent and independent variables, it has introduced new terms called exogenous and endogenous latent variables. While the former refers to variables which are not explained by the proposed model (i.e. always act as independent variables), the latter represents variables that are explained by the relationships postulated in the model (Diamantopoulos, 1994).

Furthermore, SEM methods enable the researcher to incorporate unobservable variables (also called latent variables, or constructs) measured by indicator variables (also called items, manifest variables, or observed measures), whilst including the measurement error for the observed variables (Chin, 1998; Haenlein & Kaplan, 2004; Hair et al., 2014; Polites et al., 2012).

Given the advantages of second generation methods, this study chose SEM methods. In the following paragraphs, different SEM approaches are analyzed and the method most relevant to this study will be selected.

4.9.2 Structural equation modeling (SEM) methods

Based on their approach to estimating the parameters of a structural model, SEM methods are generally classified into two groups: (1) covariance-based methods, and (2) variance-based (components-based) methods (Haenlein & Kaplan, 2004; Hair et al., 2014). Covariance-based SEM (CB-SEM) is primarily applied in confirmatory studies to confirm or reject a theoretical model by determining how well the proposed model can estimate the

covariance matrix for a sample data set (Hair et al., 2014), whereas, variance-based SEM such as the partial least squares (PLS-SEM), takes a more exploratory approach to develop theories by explaining the variance in the endogenous constructs within the model. That is, PLS-SEM estimates the path relationships in the model by using sample data to minimize the error terms (i.e. the residual variance) of the endogenous constructs (Hair et al., 2014). Put another way, PLS-SEM calculates the path coefficients to maximize the R^2 values of the endogenous constructs.

Not only are these two methods not competitors, but they can be considered complementary for different research settings because each method may suit specific empirical contexts and objectives (Chin, 2010). Although the results for CB-SEM and PLS-SEM are typically very close and PLS-SEM estimates can be good proxies of CB-SEM results, several conditions should be considered when choosing most appropriate option (Hair et al., 2014). For example, Chin (2010) identified some key issues considered in previous studies as justifications for the choice of PLS-SEM over CB-SEM: (1) soft distributional assumptions; (2) high model complexity as criterion; (3) sample size requirement; (4) exploratory in nature; (5) higher order molar and molecular models; (6) modeling formative measurement items; (7) accuracy of parameter estimation; (8) eschewing the 'true' model for prediction focus; (9) determinate scores/indices for predictive relevance (10) ease of model specification and model interpretation; (11) degree of emphasis on covariance explanation. Similarly, Ringle, Sarstedt, and Straub (2012) reviewed empirical studies where PLS-SEM was used as the method of analysis and were published in the MIS Quarterly journal during 1992 and 2011. Based on the review, among the 65 studies that used PLS-SEM, the most

frequently cited reasons for preferring PLS-SEM over CB-SEM were small sample sizes (24 studies, 36.92%), non-normal data (22 studies, 33.85%), and the use of formatively measured latent variables (20 studies, 30.77%).

Based on the empirical settings used in this study, two critical issues were considered (data set, model properties), as advised by (Hair et al., 2014), and consequently, PLS-SEM was selected for analytical purposes. In the following paragraphs, the justification for using PLS-SEM is highlighted by comparing CB-SEM and PLS-SEM around two issues.

4.9.2.1 Data set

Basically, an analysis of covariance structures is grounded in large sample theory (Byrne, 2010), and although efforts were made to adapt CB-SEM technique to accommodate small sample sizes (e.g. Nevitt & Hancock, 2004), it is still sensitive to sample size and small sample size reduces its statistical power (Kline, 2011). Additionally, MacCallum, Browne, and Sugawara (1996) argued that confidence intervals can also be seriously influenced by sample size. Several factors affect the optimum sample size in CB-SEM, including the number of measurement parameters, the type of estimation algorithm used in the analysis, the distributional characteristics of the data, complexity of the model, and so on (Kline, 2011; MacCallum et al., 1996). A typical sample size in studies where CB-SEM was used is about 200 cases (Kline, 2011). In inter-organizational relationships (IORs) governance literature, the least sample size used for covariance-based SEM was found in two relevant studies undertaken by Zhang et al. (2009) and Fryxell, Dooley, and Vryza (2002) with samples of 124 public-private partnership (PPP) firms and 129 international joint ventures (IJVs),

respectively. Unlike covariance-based SEM, PLS-SEM can handle small sample sizes (Chin, Marcolin, & Newsted, 2003; Hair, Sarstedt, Ringle, & Mena, 2012). There have been a range of studies that systematically evaluated the performance of PLS-SEM with small sample sizes and they all concluded that it is a good choice when the sample size is small (Chin & Newsted, 1999; Hui & Wold, 1982; Reinartz, Haenlein, & Henseler, 2009). A review of construction management studies related to organizational and inter-organizational issues revealed that in studies with small sample sizes (e.g. 41 or 51 cases) the PLS-SEM method was successfully applied (Aibinu, Ling, & Ofori, 2011; Lim, Ling, Ibbs, Raphael, & Ofori, 2010; Ling et al., 2013). As explained in earlier sections, the sample size in this study was 84 and 41 for the Iranian and Australian data sets, respectively, so based on these explanations PLS-SEM was recognized as the preferred method for this study.

Furthermore, the normality of data is another concern when using the CB-SEM method because most estimation techniques used in CB-SEM require normal data in order to obtain reliable estimates (Shook, Ketchen, Hult, & Kacmar, 2004), which means that applying this method with non-normal data could result in distorted goodness-of-fit measures and underestimated standard errors (MacCallum, Roznowski, & Necowitz, 1992). In these conditions, underestimated standard errors may be accounted for significant coefficients in the model and result in inaccurate findings and conclusions (Hult et al., 2006). Fortunately PLS-SEM has no distributional assumption, so unlike CB-SEM which assumes a specific joint multivariate distribution and independence of observations, PLS modeling is based on predictor specification. Thus, not only are no restrictions imposed on the structure of the residual covariance, the residual variance terms are actually minimized under PLS modeling

(Chin, 2010). Small sample sizes are generally subjected to non-normality and need special considerations to fulfill normality assumptions (Field, 2013), but having said that, PLS-SEM becomes the preferred method in studies with small sample sizes, and therefore this study adopted PLS-SEM.

4.9.2.2 Model properties

Confidence intervals can be seriously influenced not only by sample size, but also by model complexity (MacCallum et al., 1996). For example, if the sample size is small and the number of estimated parameters is large, the confidence interval will be wide. Accordingly, given a complex model (i.e., a large number of estimated parameters), the CB-SEM method requires a very large sample size in order to obtain a reasonably narrow confidence interval, whereas the PLS-SEM method is very flexible regarding model complexity. That is, PLS-SEM can robustly estimate complex models with many latent variables and/or indicators (Hair et al., 2014), and since our proposed research model is complex and has a large number of latent variables and indicators, it is better adapted to the PLS-SEM technique.

4.9.3 Software for undertaking PLS-SEM method

From the early years of development and advancement of the PLS-SEM approach (Lohmöller, 1989; Wold, 1974), various software packages were already available for researchers to analyze their data. Of these many software packages such as LVPLS (Lohmöller, 1984), PLS-GUI (Y Li, 2005), VisualPLS (Fu, 2006), PLS-Graph (Chin, 2003), and SmartPLS (Ringle, Wende, & Will, 2005), the last one was selected for this study because

it was free, easy to use, and there was a book (Hair et al., 2014) that had recently been published and could be used as a guide for applying the software. All the steps required for undertaking the data analysis process were very well explained in the book, which made applying the smartPLS software much more reliable. There was also a forum available for users to share their experiences and discuss different issues raised through their analysis.

4.10 Chapter summary

In this chapter the whole research process and research design method has been described. In the research design section, the reason for selecting survey design was explained and the logic behind doing cross-national study was defended. Then, by considering the limitations associated with this study, cross-sectional study was preferred over longitudinal study, and afterwards, the sampling frame, including case selection, unit of analysis, and survey respondents were explained. In the next section, after comparing different data collection methods, a questionnaire was chosen as the preferred method, and the steps for preparing and implementing the survey were described. In the final section, the first generation and second generation methods for analyzing data were compared and the PLS-SEM was selected as the most suitable method for this research. SmartPLS software package was also selected for analyzing the measurements and the structural models.

CHAPTER FIVE: DATA ANALYSIS

- ***Introduction***
- ***Specifying the structural model***
- ***Specifying the measurement model***
- ***Preparing & examining data***
- ***Evaluating the measurement model***
- ***Evaluating the structural model***
- ***Chapter summary***

5.1 Introduction

As discussed in the previous chapter, PLS-SEM was selected to analyze the survey data in this study. The data preparation and analytical processes are outlined in Figure 5-1 and described below.

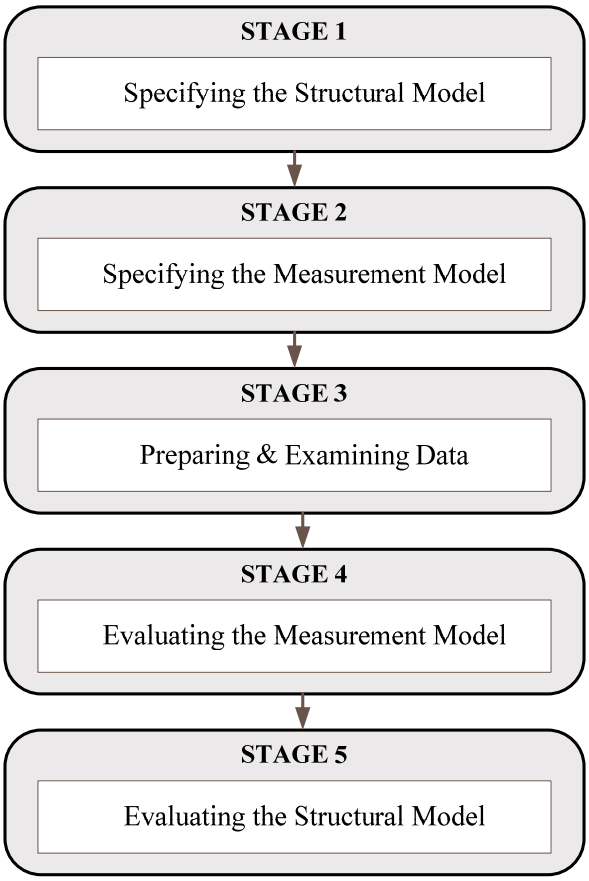

Figure 5-1 : Process for data analysis using PLS-SEM (Hair et al., 2014)

Figure 5-1 shows that the first two stages for undertaking research using PLS-SEM approach are to define the structural model and measurement models to establish the path model. The path model is a diagram based on theory that connects different variables/constructs in the research model which depicts the proposed hypotheses that will be

tested in the study. In PLS-SEM, the path model consists of two elements: (1) the structural model (inner model), and (2) the measurement model (outer model). Where the structural model describes the relationships between the latent variables, the measurement model defines the relationship between the constructs and indicators. As discussed before, there are two types of variables in path models: (1) exogenous variables (act always as independent variables), and (2) endogenous variables (explained by the relationships postulated in the model) (Diamantopoulos, 1994). Accordingly, a path model, such as the one shown in Figure 5-2, can be represented by three sets of equations to describe all the proposed relationships between different parameters of the research model.

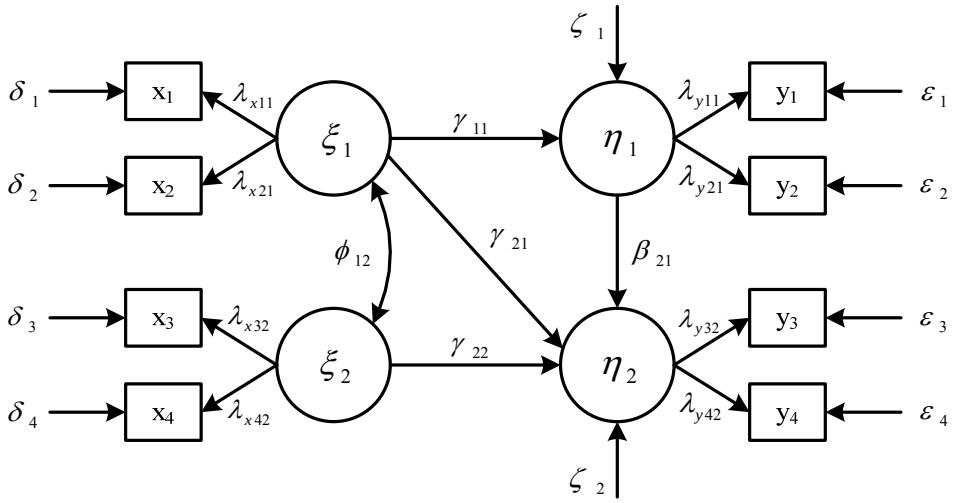

Figure 5-2 : path diagram scheme (Diamantopoulos, 1994; Haenlein & Kaplan, 2004)

Note: η (eta) = latent endogenous variable; ξ (xi) = latent exogenous (i.e., independent) variable; ζ (zeta) = random disturbance term; γ (gamma) = path coefficient; ϕ (phi) = non-causal relationship between two latent exogenous variables; y_i = indicators of endogenous variables; ε_i (epsilon) = measurement errors for indicators of endogenous variable; λ_{yi} (lambda y) = loadings of indicators of endogenous variable; x_i = indicators of exogenous variable; δ_i (delta) = measurement error for indicators of exogenous variable; λ_{xi} (lambda x) = loadings of indicators of exogenous variable.

The first set of equations represent measurement models that are related to the indicators of the exogenous variables (x), to their associated measurement error (δ), and the latent exogenous variables (ξ):

$$x_1 = \lambda_{x11}\xi_1 + \delta_1 \quad 5\text{-}1$$

$$x_2 = \lambda_{x21}\xi_1 + \delta_2 \quad 5\text{-}2$$

$$x_3 = \lambda_{x32}\xi_2 + \delta_3 \quad 5\text{-}3$$

$$x_4 = \lambda_{x42}\xi_2 + \delta_4 \quad 5\text{-}4$$

The second set of equations describes the measurement models where the relationship between the indicators of the endogenous variables (y), their associated measurement error (ε), and the latent endogenous variables (η) are depicted:

$$y_1 = \lambda_{y11}\eta_1 + \varepsilon_1 \quad 5\text{-}5$$

$$y_2 = \lambda_{y21}\eta_1 + \varepsilon_2 \quad 5\text{-}6$$

$$y_3 = \lambda_{y32}\eta_2 + \varepsilon_3 \quad 5\text{-}7$$

$$y_4 = \lambda_{y42}\eta_2 + \varepsilon_4 \quad 5\text{-}8$$

Finally, the last set represents the structural model that deals with the relationship between the latent endogenous (η) and exogenous (ξ) variables:

$$\eta_1 = \gamma_{11}\xi_1 + \zeta_1 \quad 5\text{-}9$$

$$\eta_2 = \beta_{21}\eta_1 + \gamma_{21}\xi_1 + \gamma_{22}\xi_2 + \zeta_2 \quad 5\text{-}10$$

By applying matrix algebra, these three sets of equations can also be written in the following way:

$$x = \Lambda_x\xi + \delta \quad 5\text{-}11$$

$$y = \Lambda_y \eta + \varepsilon \quad 5\text{-}12$$

$$\eta = B \eta + \Gamma \chi + \zeta \quad 5\text{-}13$$

Where equations 5-11 and 5-12 represent the measurement models, equation 5-13 describes the structural model, and the aggregated models can be subsumed by the term structural equation model.

In the following sections of this chapter, the basic concepts of structural and measurement model specifications are introduced, the structural and measurement models for this study are established, and then, the main considerations regarding data preparation for undertaking PLS-SEM method are discussed. Afterwards, the established measurement models and structural models are evaluated using the SmartPLS software package (Ringle et al., 2005), and then the research results are demonstrated.

5.2 Specifying the structural model

The structural model defines the relationship between the constructs, which is guided by theory, logic, or practical insight (Hair et al., 2014). As discussed in Chapter four, the main constructs in this research are Project Control Capability (PC), Social Capital (SC), Collaboration (CL), Formal Contracts (FC), Project Performance (PP), and Relationship Satisfaction (RS). Additionally, Project Size (PS) has been used as a control variable. Figure 5-3 shows the structural model proposed in this study.

A construct can be modeled as a single-order or a higher-order construct. Using a higher-order construct enables the researcher to develop more concise explanations of how

broad concepts tie to existing well-known relationships and make the empirical research more realistic (Polites et al., 2012). Furthermore, it can enhance theoretical parsimony and reduce the model complexity (Hair et al., 2014).

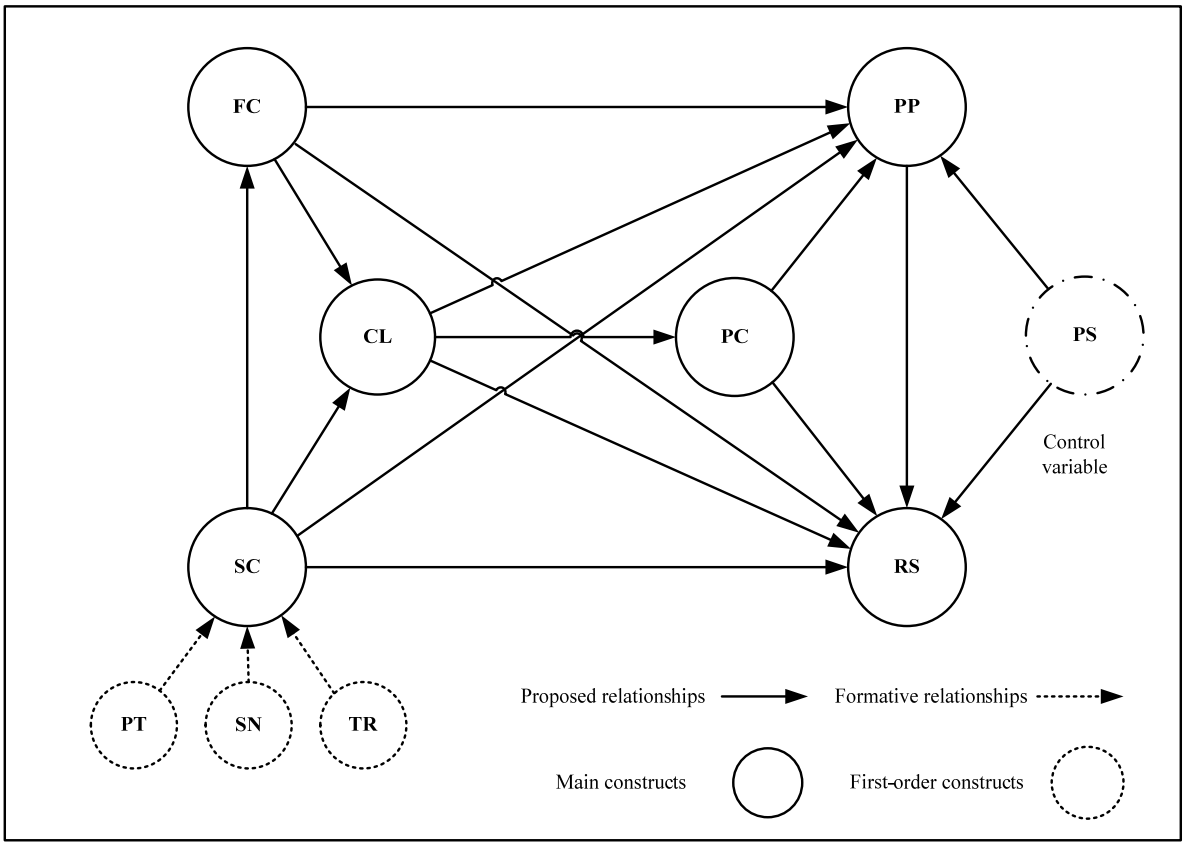

Figure 5-3 : Proposed structural model

Note: SC= Social Capital, PT= Prior Ties, SN= Shared Norms, TR= Trust, CL= Collaboration, FC= Formal Contracts, PC= Project Control Capability, PP= Project (time&cost) Performance, RS= Relationship Satisfaction, PS= Project Size.

In this study, Social Capital (SC) is modeled as a second-order construct consisting of three first-order constructs including: Prior Ties (PT), Shared Norms (SN), and Trust (TR). As these three first-order constructs tap into different dimensions that form social capital among partners, the parent construct—social capital—is modeled as a formative construct.

As discussed by Baron and Kenny (1986), there may be many different forms of relationships among variables other than simple bilateral relationships between dependent and independent variables, such as mediated or moderated relationships, so different types of mediation effects are briefly introduced because they will be used in this study.

5.2.1 Mediation relationship

As shown in Figure 5-4, a variable is considered to be a mediator when it meets the following conditions: (1) variations in the levels of the independent variable significantly account for variations in the presumed mediation (i.e., path a), (2) variations in the mediator significantly account for variations in the dependent variable (i.e., path b), and (3) when paths a and b are controlled, a previously significant relationship between the independent and dependent variables is no longer significant, with the strongest demonstration of the mediation occurring when path c' is zero (Baron & Kenny, 1986). The third condition assumes that the direct relationship between predictor and outcome variables are significant before adding the mediator variable.

However, Hayes (2009) pointed out that the third condition may not hold all the time, even though the mediation effect still exists. For example, the predictor-mediator and mediator-outcome relationships are both significant, but the direct relationship between predictor and outcome variables is insignificant because the two path coefficients are in opposite signs and cancel each other out (Hayes, 2009; MacKinnon, Krull, & Lockwood, 2000). Correspondingly, Mathieu and Taylor (2006) introduced three alternative intervening

models based on different interactions between predictor, mediator, and outcome variables (Figure 5-5).

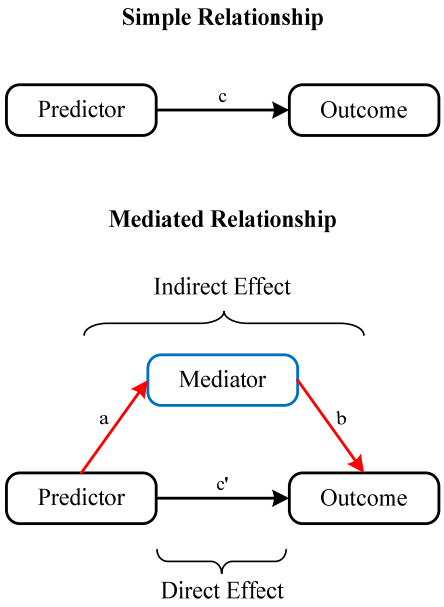

Figure 5-4 : Schematic diagrams of simple and mediated relationships (Field, 2013)

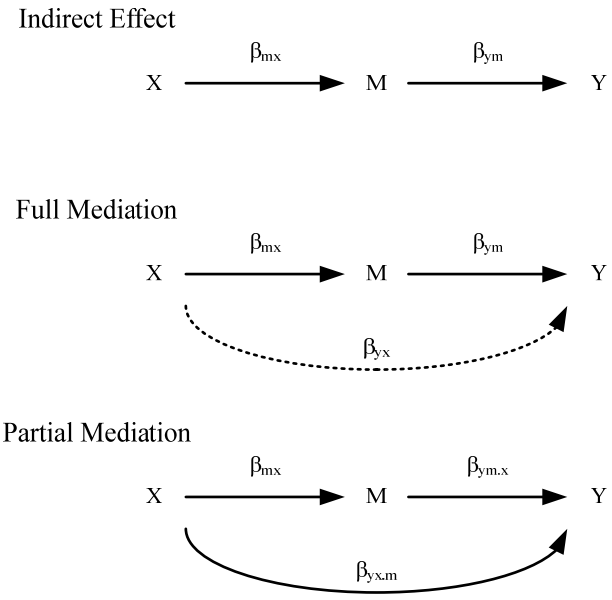

Figure 5-5 : Alternative intervening models (Mathieu & Taylor, 2006)

As illustrated in Figure 5-5, the indirect effects model refers to situations where only the combined effect ($\beta_{mx} \times \beta_{ym}$) is a significant observed relationship and implicitly suggests that the total $X \rightarrow Y$ relationship (β_{yx}) is absent. Like the indirect effects model, the full mediation model includes significant $X \rightarrow M$ (β_{mx}) and $M \rightarrow Y$ (β_{ym}) paths. However, the dashed line from $X \rightarrow Y$ in this model indicates a significant total $X \rightarrow Y$ (β_{yx}) relationship that turns out to be insignificant when $M \rightarrow Y$ (β_{ym}) is added. To put it another way, $\beta_{yx.m}$ needs to be non-significant in full mediation assumption. Unlike full mediation, a partial mediation hypothesis implies that $X \rightarrow M$ (β_{mx}), as well as both $M \rightarrow Y$ ($\beta_{ym.x}$) and $X \rightarrow Y$ ($\beta_{yx.m}$) are simultaneously significant.

5.3 Specifying the measurement model

All the constructs in this study were measured by multiple indicators, and whenever possible, the questions were adapted from a validated instrument. All the relevant constructs and their corresponding measures are demonstrated in Table 4-1.

When specifying measurement models, the main step is to decide whether the indicators are reflective or formative (Figure 5-6). In the former (also referred to as Model A measurement in PLS-SEM), variations in the indicators are caused by changes in the underlying construct, whereas in the formative models (also referred to as Model B measurement in PLS-SEM), indicators cause variations in the construct (Hair et al., 2014).

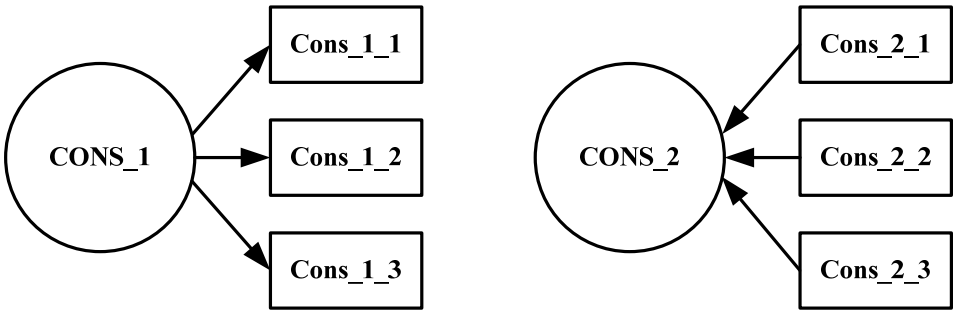

Figure 5-6 : Schematic diagrams of reflective and formative measurement models

Figure 5-7 shows the main difference between the reflective and formative measurement models. The black circles in diagrams below illustrate the construct domain, i.e., the meaning of the relevant construct that is measured by the corresponding indicators. The colored circles show the domain captured by each indicator.

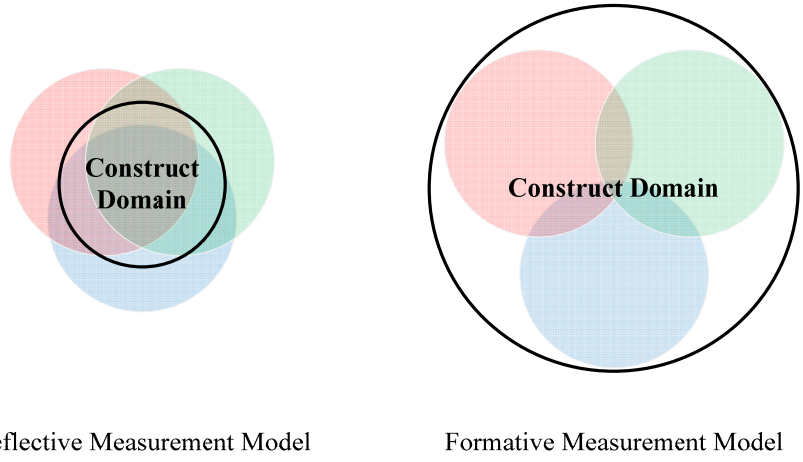

Figure 5-7 : Differences between reflective and formative measures (Hair et al., 2014)

As suggested by Diamantopoulos and Winklhofer (2001), when causal priority between the indicator and the construct is from the construct to the indicators, a reflective measurement model is preferred, but when the causal priority is from the indicators to the construct, a

formative measurement model is more appropriate. According to this guideline, all the constructs and their corresponding indicators were examined and the reflective measurement approach was selected as the preferred measurement model for all of them. Figure 5-8 shows all the research constructs and their reflective measurement models.

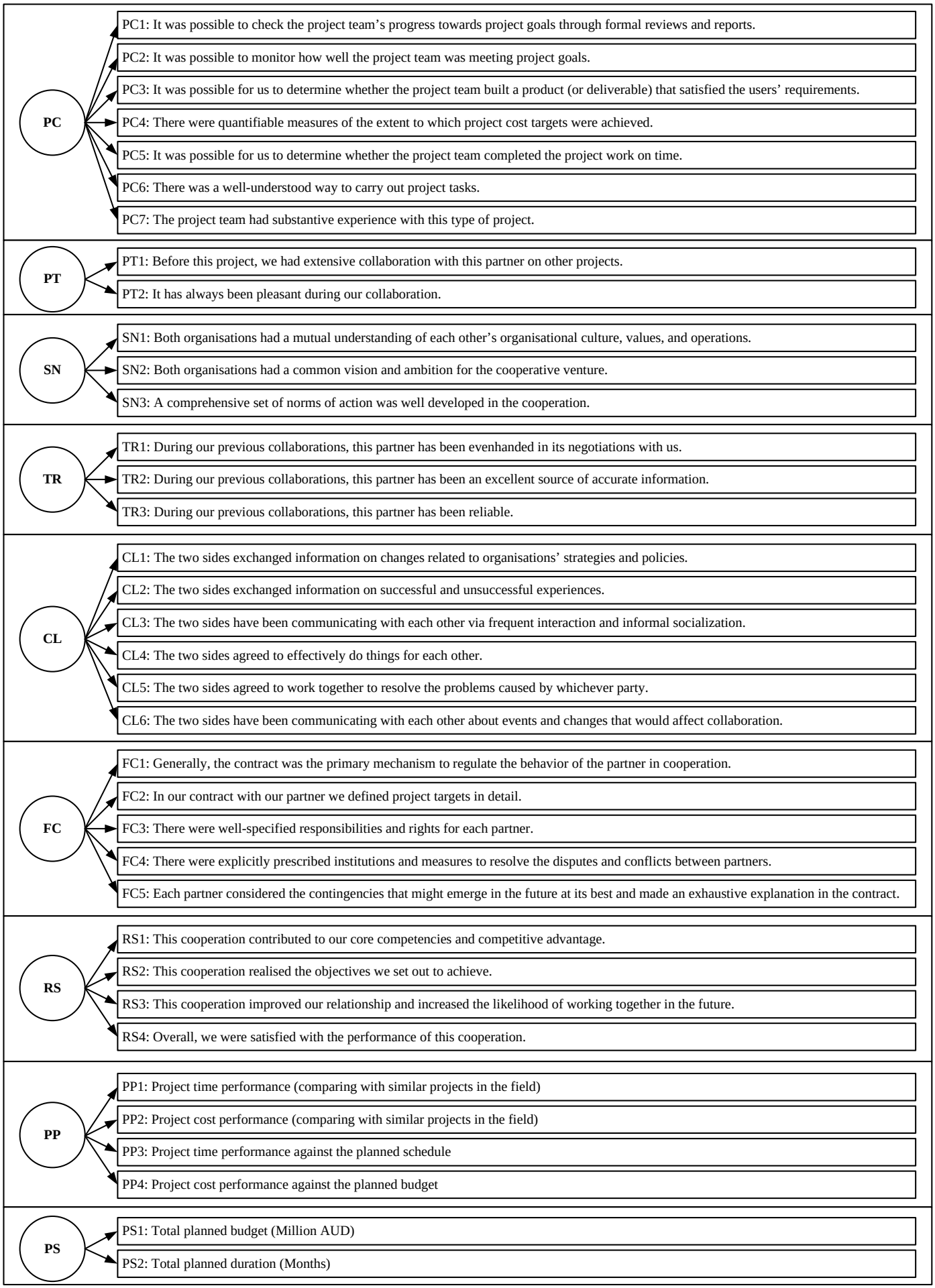

Figure 5-8 : Reflective measurement models for research model constructs

Note: PC= Project Control Capability, PT= Prior Ties, SN= Shared Norms, TR= Trust, CL= Collaboration, FC= Formal Contracts, RS= Relationship Satisfaction, PP= Project Performance, PS= Project Size.

5.4 Preparing and examining data

The data preparation stage is very important in the application of PLS-SEM. In this section, the process and methods for dealing with outliers and missing data are explained.

5.4.1.1 Outliers

An outlier is an extreme score or response to a particular question which is very different from the rest of the responses. These unusual scores may cause bias in the research model, and consequently, distort the findings (Field, 2013; Hair et al., 2014). There are several tools for spotting outliers in the dataset (e.g. histograms, z-scores, box-plots, stem-and-leaf plots). After coding all the observations (responses) in the Iranian and Australian datasets, IBM SPSS 21 software was used to draw box-plots and spot the outliers existing in each variable. Out of 84 and 41 observations in the Iranian and Australian datasets, 11 and 4 observations contained extreme outliers, respectively. As a result, the responses with extreme outliers were removed from the datasets. Table 5-1 shows the code for the removed observations and the relevant variables that were affected by the outliers.

Table 5-1 : Observations contained extreme outliers and relevant variables

Iranian dataset		Australian dataset	
Variable	Code of removed observations	Variable	Code of removed observations
PC1	31	CL6	17
PC2	44, 46	FC2	17
PC3	43, 80	FC4	17
PC5	43, 46, 78	RS2	17, 20
PC6	34	RS3	17, 20
CL4	39, 68	RS4	7, 17, 20
FC1	73, 74, 78	PP1	17

5.4.1.2 Missing data

One of the most common problems in survey research is missing data. This problem occurs when a respondent either deliberately or unintentionally, does not answer one or more questions. It has been suggested that those responses where the number of missing values exceeds 15% of the total number of questions in the questionnaire (Hair et al., 2014) should be eliminated, but since no such case was found in this study, all the responses were kept for further analysis.

Another important concern regarding missing data is the non-randomness of these values that may cause bias in research findings (Little, 1988; Little & Rubin, 2002). There were 24 and 17 missing values in the Iranian and Australian datasets, which accounted for 0.91% and 1.24% of the total number of data points in each dataset, respectively. Following Little and Rubin (2002), Little's MCAR test was performed for both datasets to check whether the missing data were missing at random. The results showed that the null hypothesis was rejected for Iranian (sig. = 0.375) and Australian (sig. = 0.642) datasets, showing there was no evidence for non-random missing data.

One of the ways for handling missing data is case-wise deletion. This method would lead to the loss of a great deal of useful data, particularly when the sample size is small. An alternative way is to replace the missing data with estimated values using methods such as multiple imputation or the expectation maximization algorithm (EM method) (Little & Rubin, 2002). However, the suitability of these methods in the PLS-SEM context has not yet been tested, so it was recommended that these approaches not be used (Hair et al., 2014). Alternatively, Hair et al. (2014) recommend using a sub-group mean to replace missing

values. To do this, all the cases are classified into subgroups based on their demographic characteristics, and then, the missing values can be replaced by the subgroup mean (Hair et al., 2014).

In this study, all the cases within both samples were classified into five subgroups based on the project field (i.e., building, water, transportation, power, oil & gas), and then, the missing values were replaced with the subgroup means.

5.5 Evaluating the measurement model

After preparing the data, it was time to evaluate the specified measurement model in order to assess the reliability and validity of the measures. This step had to be undertaken before analyzing the structural model because if the measurement of constructs were unreliable or invalid, the findings about the nature of the relationships among constructs drawn from structural model evaluation may also be invalid.

As demonstrated in Figure 5-9, validity explains the accuracy of the measuring instrument in capturing the intended concept, while reliability refers to the quality of the instrument regarding its capability to produce the same value in successive observations of the same case (Babbie et al., 2013).

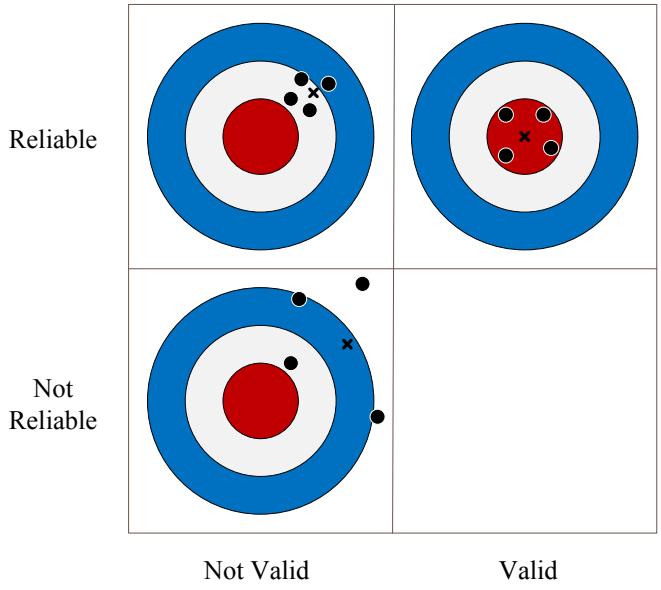

Figure 5-9 : Comparing reliability and validity (Hair et al., 2014)

To evaluate the reflective measurement models, it is common to start with convergent validity and discriminant validity (Hair et al., 2014).

5.5.1 Convergent validity

For multiple-item reflective constructs, it is useful to estimate the correlations between indicators of the same construct because indicators of a reflective construct are supposed to capture the meaning of that construct common to all of its indicators. Thus, these indicators are expected to share a high proportion of variance and converge on the same concept; which is why the convergent validity is also referred to as the homogeneity of the constructs (Ayodeji, 2008). Moreover, the outer loadings of the indicators, average variance extracted (AVE), and internal consistency reliability are also widely used to evaluate the convergent validity of the measurement models.

5.5.1.1 Outer loadings

If the indicators of a construct show high loadings, then they have more things in common and do reflect variations in the main construct, that is, the outer loadings reflect each indicator's reliability (Hair et al., 2014). As a rule of thumb, the standardized outer loadings of indicators should be 0.708 or higher. To understand the logic behind this rule, one should consider the square of a standardized indicator's outer loading which is referred to as communality. Communality shows the extent to which the variation in an indicator is caused by the construct and is defined as the variance extracted from the indicator. To be accepted as a valid measure, the relevant construct should be able to explain at least 50% of the indicator's variance. To put it another way, this rule implies that the measurement error variance is less than the shared variance between the construct and its indicator. As a result, the minimum value for an indicator's outer loading should be at least 0.708, because the outer loading is the squared root of communality ($\sqrt{0.5}$). However, it is not a strict rule and the researcher should investigate the effects of removing an indicator on other factors such as composite reliability, Cronbach's alpha, and AVE. As advised by Hair et al. (2014), indicators with outer loadings between 0.4 and 0.7 should be treated carefully and should be kept if deleting of the indicator does not increase the previously mentioned factors above the threshold value. Nonetheless, the indicators with outer loadings below 0.4 should definitely be eliminated from the measurement model (Hair et al., 2014; Hulland, 1999).

These instructions were followed, and a conservative value of 0.7 was chosen as the cut-off point for outer loadings. However, in some cases where the outer loadings were between 0.4 and 0.7, the consequence of removing the indicators regarding their effects on

other factors such as AVE, composite reliability, and Cronbach's alpha was evaluated, and if their removal did not increase the validity and reliability of the relevant measurement model, the indicator was kept. Table 5-2,Table 5-3, Table 5-5,Table 5-6 show the outer loadings for all the indicators before and after removing the redundant indicators.

5.5.1.2 Average variance extracted (AVE)

Another common measure for examining convergent validity is the average variance extracted (AVE). Unlike the outer loading that was an indicator-level factor, AVE is examined at the construct level and is defined as the grand mean value of the squared loadings of the construct's indicators (i.e., the sum of the squared loadings divided by the number of indicators). In other words, it represents the communality of the construct. The rationale behind AVE is the same as the one explained for outer loadings, and as a result, the threshold value for AVE was 0.5 or higher (Fornell & Larcker, 1981). That is, If AVE was less than 0.5, the measurement error was relatively greater than the variance of indicators explained by the corresponding construct (Hair et al., 2014). AVE can be calculated using the following formula:

$$AVE = \frac{\sum_i \lambda_i^2}{\sum_i \lambda_i^2 + \sum_i var(\varepsilon_i)} \qquad 5\text{-}14$$

Where λ_i is the factor loading between each indicator and its corresponding latent construct, and

$$var(\varepsilon_i) = (1 - \lambda_i^2) \qquad 5\text{-}15$$

The AVEs were calculated for each construct in the measurement models using smartPLS software (Ringle et al., 2005). Table 5-2 and Table 5-3show the AVEs for initial measurement models. After removing the indicators that did not meet the requirements, AVEs for the new measurement models were recalculated. Table 5-5 and Table 5-6 show that all the AVE values were greater than 0.5, indicating good convergent validity.

5.5.1.3 Internal consistency reliability

Traditionally, Cronbach's alpha has been used to estimate internal consistency. To estimate Cronbach's alpha, it is assumed that all the indicators are equally reliable (e.g., outer loadings of all indicators on the same construct are equal), but in PLS-SEM, the indicators are prioritized based on their individual reliability. Moreover, in multiple-item constructs it is likely that Cronbach's alpha test would underestimate the internal consistency reliability (Hair et al., 2014). Composite reliability is another measure that is more appropriate for testing the reliability of internal consistency in PLS-SEM approach because by mitigating limitations associated with Cronbach's alpha, composite reliability considers different outer loadings of the indicators. Following Hair et al. (2014), internal consistency reliability were assessed using composite reliability and Cronbach's alpha, so Cronbach's alpha (α) and composite reliability (CR) were assessed for all the constructs.

Cronbach's alpha (α) developed by Cronbach (1951) was calculated by the following formula:

$$\alpha_{standardized} = \frac{K.\bar{r}}{(1 + (K-1)\bar{r})} \qquad 5\text{-}16$$

Where K is equal to the number of indicators and $\bar{r}$ is the average inter-correlation among indicators (average of all Pearson correlation coefficients between indicators).

To calculate the composite reliability (CR), the following formula was used (Hair et al., 2014):

$$CR = \frac{(\sum_i l_i)^2}{(\sum_i l_i)^2 + \sum_i var(e_i)} \qquad 5\text{-}17$$

Where l_i represents the standardized outer loading of the indicator i of a specific construct, e_i refers to the measurement error of the indicator i, and $var(e_i)$ symbolizes the variance of the measurement error which is defined as $1 - l_i^2$.

The values for both Cronbach's alpha and composite reliability vary between 0 and 1, and the interpretation of them is the same because higher values indicate higher levels of reliability (Ayodeji, 2008; Hair et al., 2014). Nunnally and Bernstein (1994) and Churchill Jr (1979) suggest 0.7 as good and 0.6 as cut-off points. Nevertheless, values above 0.9 are not desirable for composite reliability and if the value for a construct exceeds 0.95, it means that some of its indicators are measuring the same concept, and as a result, duplicated indicators should definitely be eliminated (Hair et al., 2014). Thus, constructs with Cronbach's alpha (α) below 0.6 or Composite reliability (CR) less than 0.6 or above 0.95 were investigated to find and remove inappropriate indicators.

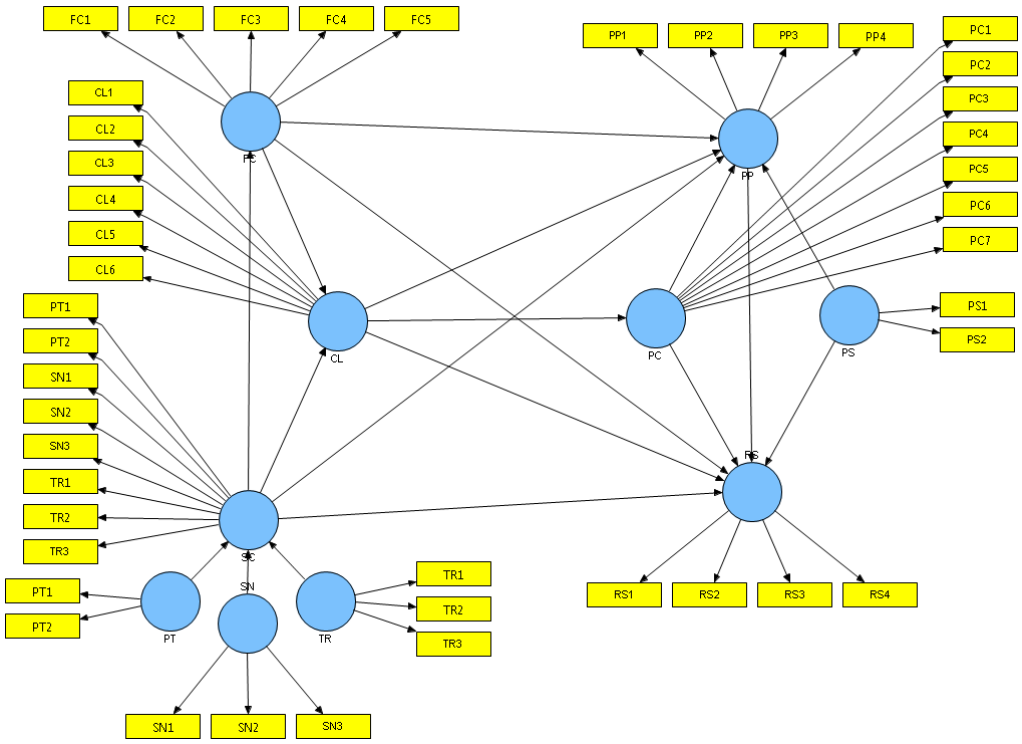

Figure 5-10 : Initial structural and measurement models (Iran)

Table 5-2 : Initial measurement models' reliability and validity (Iran)

Constructs and indicators	Outer loadings	AVE	CR	α
Project Control Capability (PC):		0.330	0.762	0.636
PC1: It was possible to check the project team's progress towards project goals through formal reviews and reports.	0.702			
PC2: It was possible to monitor how well the project team was meeting project goals.	0.648			
PC3: It was possible for us to determine whether the project team built a product (or deliverable) that satisfied the users' requirements.	0.541			
PC4: There were quantifiable measures of the extent to which project cost targets were achieved.	0.403			
PC5: It was possible for us to determine whether the project team completed the project work on time.	0.251			
PC6: There was a well-understood way to carry out project tasks.	0.667			
PC7: The project team had substantive experience with this type of project.	0.657			
Social Capital (SC):		0.780	0.966	0.959
Prior Ties (PT)		0.760	0.864	0.690
PT1: Before this project, we had extensive collaboration with this partner on other projects.	0.834			
PT2: It has always been pleasant during our collaboration.	0.908			
Shared Norms (SN)		0.902	0.965	0.946
SN1: Both organizations had a mutual understanding of each other's organizational culture, values, and operations.	0.934			
SN2: Both organizations had a common vision and ambition for the cooperative venture.	0.945			
SN3: A comprehensive set of norms of action was well developed in the cooperation.	0.972			
Trust (TR)		0.891	0.961	0.939
TR1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	0.954			
TR2: During our previous collaborations, this partner has been an excellent source of accurate information.	0.920			
TR3: During our previous collaborations, this partner has been reliable.	0.956			

Table 5-2 : Initial measurement models' reliability and validity (Iran) (Cont.)

Constructs and indicators	Outer loadings	AVE	CR	α
Collaboration (CL):		0.444	0.824	0.750
CL1: The two sides exchanged information on changes related to organizations' strategies and policies.	0.662			
CL2: The two sides exchanged information on successful and unsuccessful experiences.	0.616			
CL3: The two sides have been communicating with each other via frequent interaction and informal socialization.	0.486			
CL4: The two sides agreed to effectively do things for each other.	0.812			
CL5: The two sides agreed to work together to resolve the problems caused by whichever party.	0.620			
CL6: The two sides have been communicating with each other about events and changes that would affect collaboration.	0.750			
Formal Contract (FC):		0.594	0.879	0.838
FC1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	0.739			
FC2: In our contract with our partner we defined project targets in detail.	0.704			
FC3: There were well-specified responsibilities and rights for each partner.	0.826			
FC4: There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	0.773			
FC5: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	0.805			
Relationship Satisfaction (RS):		0.668	0.886	0.820
RS1: This cooperation contributed to our core competencies and competitive advantage.	0.528			
RS2: This cooperation realised the objectives we set out to achieve.	0.920			
RS3: This cooperation improved our relationship and increased the likelihood of working together in the future.	0.861			
RS4: Overall, we were satisfied with the performance of this cooperation.	0.898			
Project (time&cost) Performance (PP):		0.566	0.836	0.740
PP1: Project time performance (compared to similar projects in the field)	0.813			
PP2. Project cost performance (comparing to similar projects in the field)	0.794			
PP3: Project time performance against the planned schedule	0.808			
PP4: Project cost performance against the planned budget	0.564			
Project Size (PS):		0.659	0.784	0.813
PS1: Total planned budget (Million AUD)	0.580			
PS2: Total planned duration (Months)	0.991			

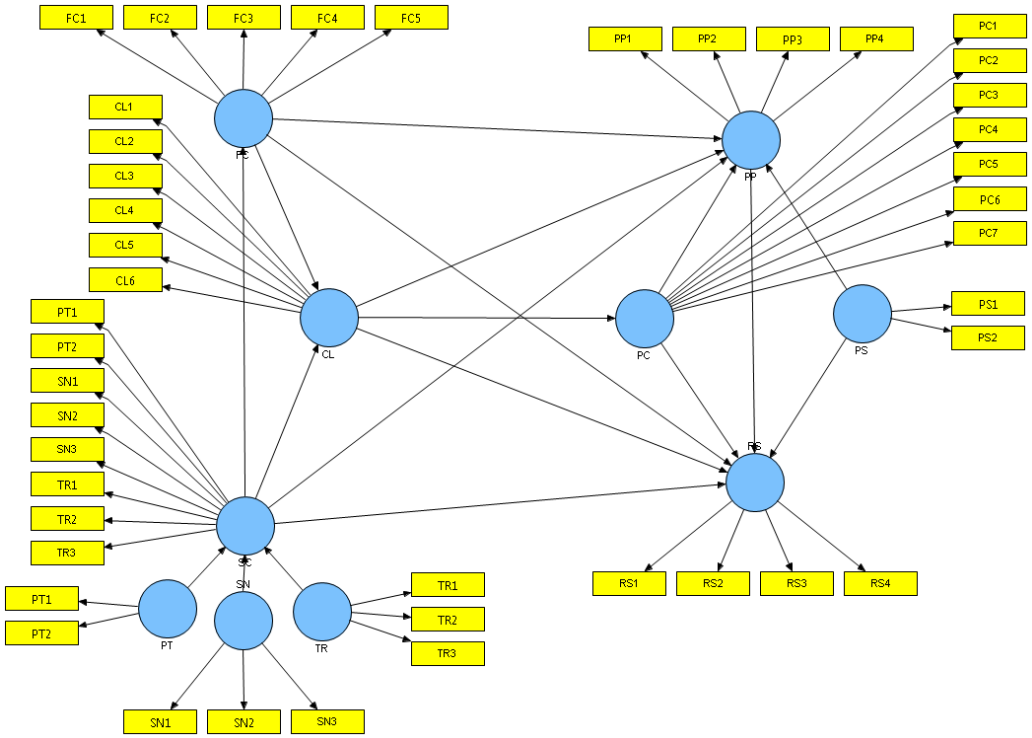

Figure 5-11 : Initial structural and measurement models (Australia)

Table 5-3 : Initial measurement models' reliability and validity (Australia)

Constructs and indicators	Outer loadings	AVE	CR	α
Project Control Capability (PC):		0.349	0.732	0.630
PC1: It was possible to check the project team's progress towards project goals through formal reviews and reports.	0.441			
PC2: It was possible to monitor how well the project team was meeting project goals.	0.689			
PC3: It was possible for us to determine whether the project team built a product (or deliverable) that satisfied the users' requirements.	0.055			
PC4: There were quantifiable measures of the extent to which project cost targets were achieved.	0.040			
PC5: It was possible for us to determine whether the project team completed the project work on time.	0.836			
PC6: There was a well-understood way to carry out project tasks.	0.762			
PC7: The project team had substantive experience with this type of project.	0.702			
Social Capital (SC):		0.780	0.966	0.959
Prior Ties (PT)		0.846	0.916	0.818
PT1: Before this project, we had extensive collaboration with this partner on other projects.	0.909			
PT2: It has always been pleasant during our collaboration.	0.930			
Shared Norms (SN)		0.833	0.937	0.900
SN1: Both organizations had a mutual understanding of each other's organizational culture, values, and operations.	0.985			
SN2: Both organizations had a common vision and ambition for the cooperative venture.	0.918			
SN3: A comprehensive set of norms of action was well developed in the cooperation.	0.915			
Trust (TR)		0.846	0.943	0.909
TR1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	0.904			
TR2: During our previous collaborations, this partner has been an excellent source of accurate information.	0.936			
TR3: During our previous collaborations, this partner has been reliable.	0.919			

Table 5-3 : Initial measurement models' reliability and validity (Australia) (Cont.)

Constructs and indicators	Outer loadings	AVE	CR	α
Collaboration (CL):		0.443	0.825	0.748
CL1: The two sides exchanged information on changes related to organizations' strategies and policies.	0.567			
CL2: The two sides exchanged information on successful and unsuccessful experiences.	0.631			
CL3: The two sides have been communicating with each other via frequent interaction and informal socialization.	0.673			
CL4: The two sides agreed to effectively do things for each other.	0.710			
CL5: The two sides agreed to work together to resolve the problems caused by whichever party.	0.797			
CL6: The two sides have been communicating with each other about events and changes that would affect collaboration.	0.586			
Formal Contract (FC):		0.517	0.840	0.816
FC1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	0.747			
FC2: In our contract with our partner we defined project targets in detail.	0.694			
FC3: There were well-specified responsibilities and rights for each partner.	0.647			
FC4: There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	0.588			
FC5: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	0.885			
Relationship Satisfaction (RS):		0.767	0.929	0.897
RS1: This cooperation contributed to our core competencies and competitive advantage.	0.755			
RS2: This cooperation realised the objectives we set out to achieve.	0.931			
RS3: This cooperation improved our relationship and increased the likelihood of working together in the future.	0.875			
RS4: Overall, we were satisfied with the performance of this cooperation.	0.930			
Project (time&cost) Performance (PP):		0.639	0.875	0.811
PP1: Project time performance (compared to similar projects in the field)	0.902			
PP2. Project cost performance (comparing to similar projects in the field)	0.808			
PP3: Project time performance against the planned schedule	0.751			
PP4: Project cost performance against the planned budget	0.724			
Project Size (PS):		0.840	0.913	0.816
PS1: Total planned budget (Million AUD)	0.885			
PS2: Total planned duration (Months)	0.947			

5.5.1.4 Removing redundant indicators

Based on the criteria defined for assessing the reliability and validity of measurement models, an iterative analysis of measurement models was conducted using smartPLS software (Ringle et al., 2005) to improve the models. To achieve this, the indicators were initially entered into the measurement models (as defined in section 5-1) and set out in the software, and then, based on the structural model developed in section 5-2, the relationships between measurement models were designed in the software and the model was run. After each run, the measurement models were checked against criteria, and indicators which violated one or

more conditions were removed in sequence after each run. This iterative process was continued until all the indicators and constructs met the reliability and validity requirements. Table 5-4 summarizes the indicators that were removed and the reason for their removal. Furthermore, where Figure 5-12 and Table 5-5 present the final measurement models and the relevant validity and reliability factors for the Iranian dataset, Figure 5-13 and Table 5-6 demonstrate the same results for the Australian case.

Table 5-4 : Removed indicators and the reason for their elimination

Indicator	Reason for elimination
PC3	Outer loading was below 0.4 in Australian model.
PC4	Outer loading was below 0.4 in both Iranian and Australian models.
PC5	Outer loading was below 0.4 in Iranian model. But it was kept for Australian model, because its outer loading was between 0.4 and 0.7 and its deletion decreased AVE below threshold (0.5)
SN3	Its deletion improved the CR in Iranian model to fall below 0.95 for the relevant construct (SN).
TR3	Its deletion improved the CR in Iranian model to fall below 0.95 for the relevant construct (TR).
CL1	Outer loading was between 0.4 and 0.7 in Australian model and its deletion increased AVE above threshold (0.5).
CL3	Outer loading was between 0.4 and 0.7 in Iranian model and its deletion increased AVE above threshold (0.5).

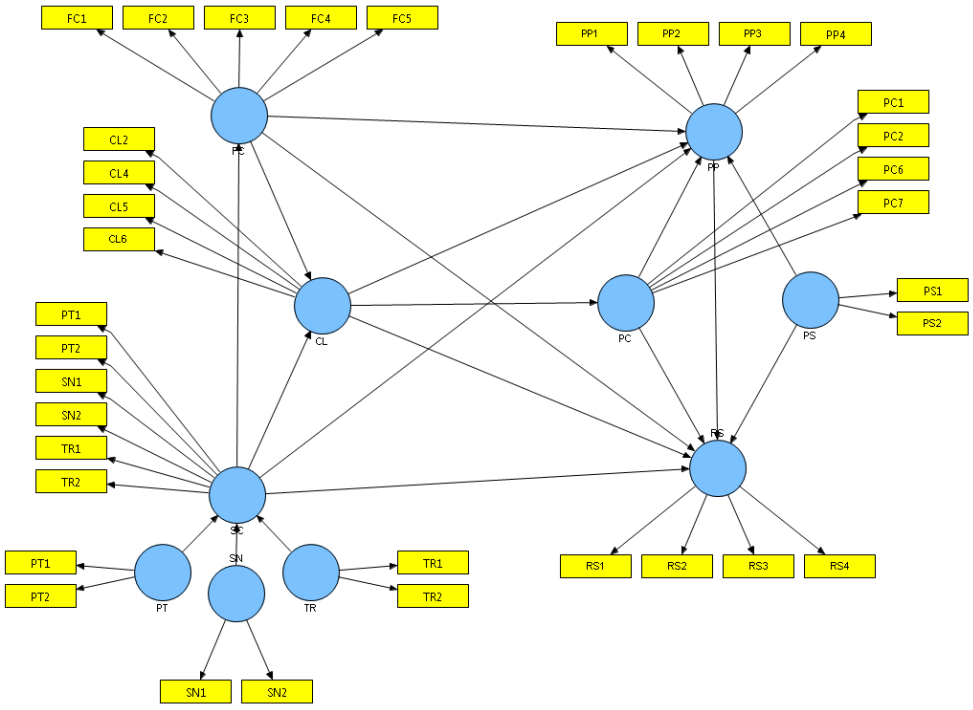

Figure 5-12 : Final structural and measurement models (Iran)

Table 5-5 : Final measurement models' reliability and validity (Iran)

Constructs and indicators	Outer loadings	AVE	CR	α
Project Control Capability (PC):		0.501	0.800	0.668
PC1: It was possible to check the project team's progress towards project goals through formal reviews and reports.	0.716			
PC2: It was possible to monitor how well the project team was meeting project goals.	0.660			
PC6: There was a well-understood way to carry out project tasks.	0.751			
PC7: The project team had substantive experience with this type of project.	0.700			
Social Capital (SC):		0.759	0.949	0.935
Prior Ties (PT)		0.761	0.864	0.690
PT1: Before this project, we had extensive collaboration with this partner on other projects.	0.837			
PT2: It has always been pleasant during our collaboration.	0.905			
Shared Norms (SN)		0.897	0.946	0.886
SN1: Both organizations had a mutual understanding of each other's organizational culture, values, and operations.	0.948			
SN2: Both organizations had a common vision and ambition for the cooperative venture.	0.947			
Trust (TR)		0.901	0.948	0.891
TR1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	0.950			
TR2: During our previous collaborations, this partner has been an excellent source of accurate information.	0.949			
Collaboration (CL):		0.525	0.813	0.707
CL2: The two sides exchanged information on successful and unsuccessful experiences.	0.610			
CL4: The two sides agreed to effectively do things for each other.	0.858			
CL5: The two sides agreed to work together to resolve the problems caused by whichever party.	0.674			
CL6: The two sides have been communicating with each other about events and changes that would affect collaboration.	0.731			
Formal Contract (FC):		0.599	0.882	0.838
FC1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	0.745			
FC2: In our contract with our partner we defined project targets in detail.	0.725			
FC3: There were well-specified responsibilities and rights for each partner.	0.829			
FC4: There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	0.750			
FC5: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	0.816			
Relationship Satisfaction (RS):		0.668	0.886	0.820
RS1: This cooperation contributed to our core competencies and competitive advantage.	0.542			
RS2: This cooperation realised the objectives we set out to achieve.	0.920			
RS3: This cooperation improved our relationship and increased the likelihood of working together in the future.	0.857			
RS4: Overall, we were satisfied with the performance of this cooperation.	0.893			
Project (time&cost) Performance (PP):		0.565	0.836	0.740
PP1: Project time performance (compared to similar projects in the field)	0.820			
PP2. Project cost performance (comparing to similar projects in the field)	0.796			
PP3: Project time performance against the planned schedule	0.803			
PP4: Project cost performance against the planned budget	0.557			
Project Size (PS):		0.660	0.784	0.813
PS1: Total planned budget (Million AUD)	0.581			
PS2: Total planned duration (Months)	0.991			

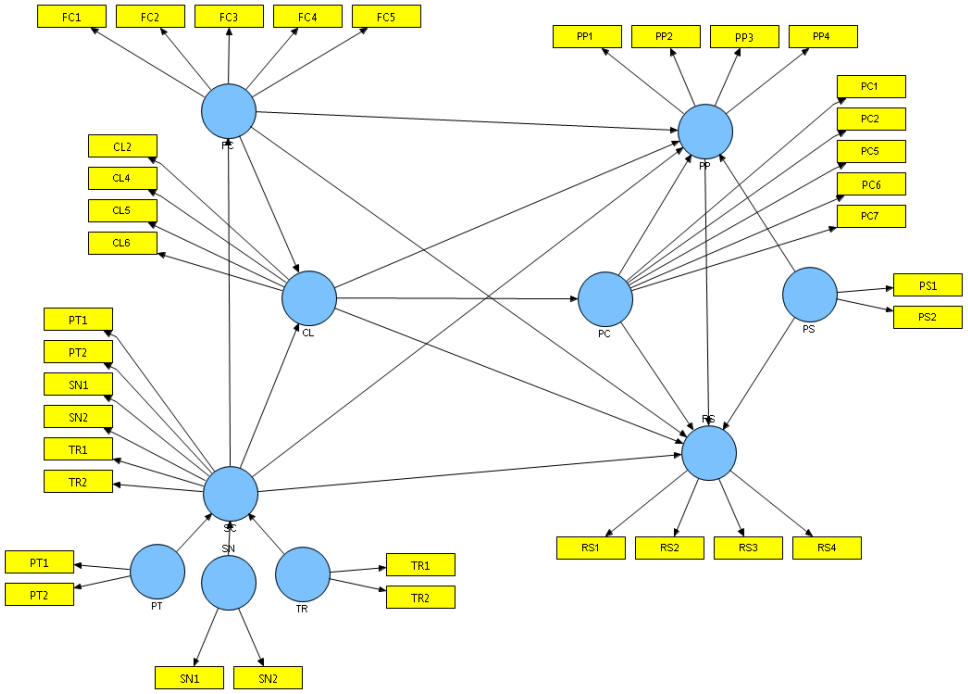

Figure 5-13 : Final structural and measurement models (Australia)

Table 5-6 : Final measurement models' reliability and validity (Australia)

Constructs and indicators	Outer loadings	AVE	CR	α
Project Control Capability (PC):		0.500	0.825	0.765
PC1: It was possible to check the project team's progress towards project goals through formal reviews and reports.	0.447			
PC2: It was possible to monitor how well the project team was meeting project goals.	0.707			
PC5: It was possible for us to determine whether the project team completed the project work on time.	0.820			
PC6: There was a well-understood way to carry out project tasks.	0.759			
PC7: The project team had substantive experience with this type of project.	0.721			
Social Capital (SC):		0.773	0.953	0.941
Prior Ties (PT)		0.846	0.916	0.818
PT1: Before this project, we had extensive collaboration with this partner on other projects.	0.911			
PT2: It has always been pleasant during our collaboration.	0.928			
Shared Norms (SN)		0.875	0.933	0.857
SN1: Both organizations had a mutual understanding of each other's organizational culture, values, and operations.	0.936			
SN2: Both organizations had a common vision and ambition for the cooperative venture.	0.934			
Trust (TR)		0.890	0.942	0.877
TR1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	0.939			
TR2: During our previous collaborations, this partner has been an excellent source of accurate information.	0.948			
Collaboration (CL):		0.525	0.814	0.708
CL2: The two sides exchanged information on successful and unsuccessful experiences.	0.726			
CL4: The two sides agreed to effectively do things for each other.	0.757			
CL5: The two sides agreed to work together to resolve the problems caused by whichever party.	0.790			
CL6: The two sides have been communicating with each other about events and changes that would affect collaboration.	0.611			

Table 5-6 : Final measurement models' reliability and validity (Australia) (Cont.)

Constructs and indicators	Outer loadings	AVE	CR	α
Formal Contract (FC):		0.517	0.840	0.816
FC1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	0.750			
FC2: In our contract with our partner we defined project targets in detail.	0.696			
FC3: There were well-specified responsibilities and rights for each partner.	0.647			
FC4: There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	0.585			
FC5: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	0.883			
Relationship Satisfaction (RS):		0.766	0.928	0.897
RS1: This cooperation contributed to our core competencies and competitive advantage.	0.740			
RS2: This cooperation realised the objectives we set out to achieve.	0.929			
RS3: This cooperation improved our relationship and increased the likelihood of working together in the future.	0.883			
RS4: Overall, we were satisfied with the performance of this cooperation.	0.935			
Project (time&cost) Performance (PP):		0.639	0.875	0.811
PP1: Project time performance (compared to similar projects in the field)	0.902			
PP2. Project cost performance (comparing to similar projects in the field)	0.807			
PP3: Project time performance against the planned schedule	0.754			
PP4: Project cost performance against the planned budget	0.722			
Project Size (PS):		0.840	0.913	0.816
PS1: Total planned budget (Million AUD)	0.884			
PS2: Total planned duration (Months)	0.947			

5.5.2 Discriminant validity

After treating the measurement models for convergent validity and removing the redundant indicators, the next step was to examine discriminant validity. Unlike convergent validity that examines an individual construct to investigate the level of convergence between its indicators, discriminant validity compares different constructs and their indicators to make sure they are distinct and unique (Hulland, 1999). Following Chin (1998), the Fornell-Larcker analysis was applied to examine discriminant validity.

5.5.2.1 Fornell-Larcker analysis

Compared to the cross-loading test, the Fornell-Larcker analysis is a more conservative approach for evaluating discriminant validity (Hair et al., 2014). As suggested by Fornell and Larcker (1981), the square root of AVEs for each construct should be greater than all the

correlated values between that construct and all the other constructs. The rationale behind this method is to investigate whether a construct shares more variance with its correspondent indicators than any other construct. In this test, the constructs' correlations and AVE scores generated by smartPLS software (Ringle et al., 2005) were used. As demonstrated in Table 5–7 and Table 5–8, the square root of AVEs for each construct that are in bold type and located on the main diagonal of the table, were greater than the correlation of the same construct with other constructs with other constructs, which represents a strong discriminant validity.

Table 5-7 : Correlation matrix and square root of AVEs for each construct (Iran)

	PC	PT	SN	TR	CL	FC	RS	PP	PS
PC	**0.707**								
PT	0.186	**0.872**							
SN	0.125	0.842	**0.947**						
TR	0.113	0.839	0.830	**0.949**					
CL	0.386	0.330	0.406	0.326	**0.724**				
FC	0.257	-0.001	0.107	0.140	0.396	**0.774**			
RS	0.332	0.391	0.379	0.400	0.310	0.035	**0.817**		
PP	0.164	0.291	0.159	0.260	0.110	0.161	0.499	**0.752**	
PS	-0.001	0.027	0.104	0.029	0.190	0.078	0.103	-0.095	**0.812**

Note 1: PC= Project Control Capability, PT= Prior Ties, SN= Shared Norms, TR= Trust, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (time&cost) Performance, PS= Project Size.
Note 2: Bolded numbers are square root of AVEs

Table 5-8 : Correlation matrix and square root of AVEs for each construct (Australia)

	PC	PT	SN	TR	CL	FC	RS	PP	PS
PC	**0.703**								
PT	0.438	**0.920**							
SN	0.487	0.864	**0.935**						
TR	0.466	0.809	0.831	**0.944**					
CL	0.601	0.484	0.486	0.482	**0.724**				
FC	0.429	0.316	0.234	0.138	0.628	**0.719**			
RS	0.565	0.336	0.313	0.464	0.707	0.324	**0.875**		
PP	0.458	0.239	0.265	0.308	0.133	0.068	0.377	**0.799**	
PS	0.116	-0.024	-0.155	-0.197	0.157	0.216	0.056	-0.348	**0.916**

Note 1: PC= Project Control Capability, PT= Prior Ties, SN= Shared Norms, TR= Trust, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (time&cost) Performance, PS= Project Size.
Note 2: Bolded numbers are square root of AVEs

5.6 Evaluating the structural model

Having examined the reliability and validity of the measurement models, the next step was to assess the structural model such that the explanatory power of the model and the relationships between constructs could be examined. Figure 5-14 shows the process for evaluating the structural model results.

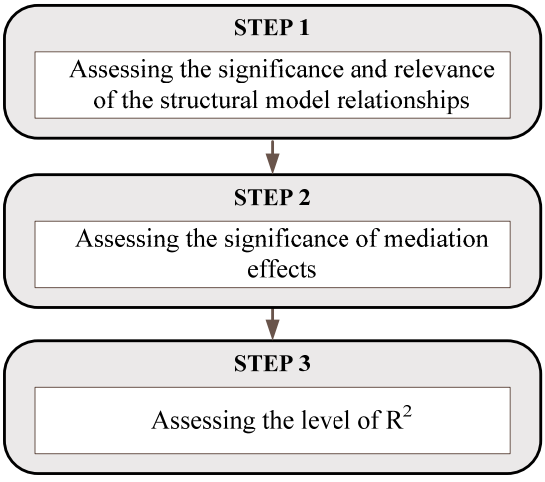

Figure 5-14 : Structural model assessment procedure (Hair et al., 2014)

5.6.1 Structural model path coefficients

Path coefficients measure the strength of the hypothesized relationships among the constructs with values between -1 and +1, which means the closer the absolute value of estimated path coefficients are to 1, the stronger the relationship, and the more likely the association will be statistically significant (i.e., different from zero in the population). However, when the path coefficients are close to zero, the relationship would be weak and non-significant (i.e., not significantly different from zero).

Since PLS-SEM does not assume normal distribution of data, parametric significance tests used in regression analysis cannot be used to analyze the significance of the path coefficients (Hair et al., 2014). As a result, PLS-SEM uses non-parametric methods such as bootstrapping to test the significance of path coefficients (Davison & Hinkley, 1997; Efron & Tibshirani, 1986). Bootstrapping is a procedure through which a large number of subsamples (i.e., bootstrapping samples) are drawn from the original sample with replacement. That is, after drawing observations from the sampling population and calculating the parameter of interest (i.e., the path coefficient), all the chosen subsamples will be returned to the sampling population before drawing the next subsample (Field, 2013; Hair et al., 2014). As a result, it is possible for one observation to be selected more than once or it may not be chosen at all for the subsample.

In this study, the bootstrapping function of smartPLS software (Ringle et al., 2005) was used to validate the theoretical model. As recommended by (Hair et al., 2014), 5000 bootstrap samples were used to run the bootstrapping procedure. By using the standard error derived

from the bootstrap distribution, it was possible to calculate the t values to test whether the path coefficient (p) was significantly different from zero using the following formula (Hair et al., 2014):

$$t = \frac{p_{ij}}{se^*_{p_{ij}}} \qquad 5\text{-}18$$

Where p_{ij} is the path coefficient from construct i to construct j, and $se^*_{p_{ij}}$ is the relevant bootstrap standard error.

Based on a general rule, with more than 30 observations, the t distribution can be explained by the normal (Gaussian) distribution. Table 5-9 shows the cumulative probability and confidence level values associated with variations of t for two-tailed test.

Table 5-9 : Values for two-tailed significance test parameters

T values	Cumulative probability	Confidence level (%)
3.29	0.001	99.9
2.58	0.01	99
1.96	0.05	95
1.65	0.10	90

When the empirical t value for a specific path in the structural model is greater than these critical values, it demonstrates the significance of the coefficient value at a certain error probability (i.e., significance level), and accordingly, the proposed association will be supported. Table 5-10 and Table 5-11 present the results of the analysis for the significance of hypothesized relationships in the Iranian and Australian models, respectively.

Table 5-10 : Structural model evaluation (Iran)

Hypothesis	Path	Original Sample	Sample Mean	Standard Deviation	Standard Error	T Statistics
H1	SC -> FC	0.093	0.1081	0.1395	0.1395	0.6658
H2	FC -> CL	0.364 **	0.376	0.1331	0.1331	2.7371
H3	SC -> CL	0.343 ***	0.3429	0.0753	0.0753	4.5552
H4	CL -> PC	0.386 ***	0.4016	0.1022	0.1022	3.7742
$H7a_1$	SC -> RS	0.236 *	0.2238	0.1186	0.1186	1.9918
H8a	FC -> RS	-0.176	-0.1656	0.1167	0.1167	1.5054
H9a	SC -> PP	0.248 *	0.2547	0.122	0.122	2.0346
H10a	FC -> PP	0.142	0.1411	0.1431	0.1431	0.9915
H11	PP -> RS	0.429 ***	0.4334	0.1251	0.1251	3.4289
Control	PS -> PP	-0.108	-0.036	0.1517	0.1517	0.7139
Control	PS -> RS	0.117	0.0332	0.132	0.132	0.8868

Note 1: PC= Project Control Capability, SC= Social Capital, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (Cost&Time) Performance, PS= Project Size.
Note 2: Critical t-values for a two-tailed test are 1.65 † (confidence level = 10%), 1.96 * (confidence level = 5%), 2.58 ** (confidence level = 1%), and 3.29 * (confidence level = 0.1%).**

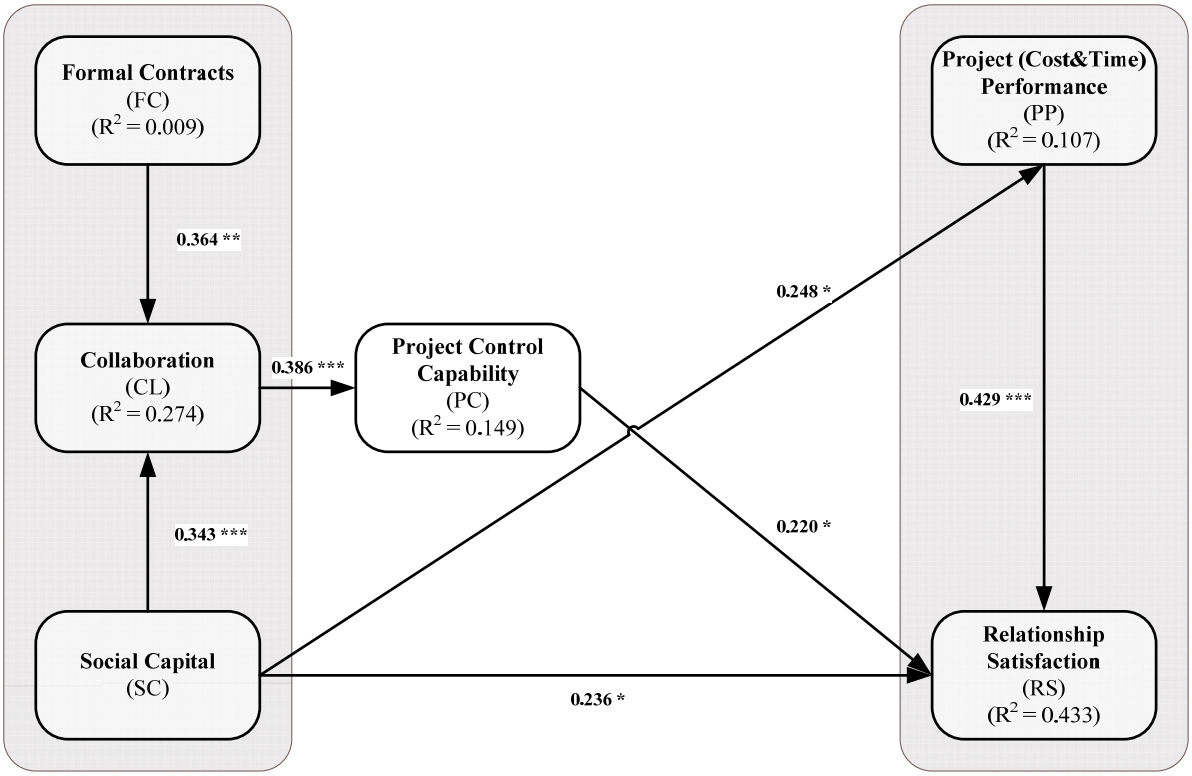

Figure 5-15 : Validated model (Iran)

Table 5-11 : Structural model evaluation (Australia)

Hypothesis	Path	Original Sample	Sample Mean	Standard Deviation	Standard Error	T Statistics
H1	SC -> FC	0.242	0.2805	0.3152	0.3152	0.7674
H2	FC -> CL	0.535 **	0.5298	0.1841	0.1841	2.9092
H3	SC -> CL	0.384 **	0.3862	0.126	0.126	3.0493
H4	CL -> PC	0.601 ***	0.6334	0.1052	0.1052	5.7104
$H7b_1$	CL -> RS	0.780 ***	0.7123	0.2078	0.2078	3.7551
H10b	FC -> PP	0.004	-0.0325	0.2655	0.2655	0.015
H11	PP -> RS	0.293 †	0.2829	0.1667	0.1667	1.7542
Control	PS -> PP	-0.383	-0.3995	0.1717	0.1717	2.2331
Control	PS -> RS	0.065	0.0634	0.1477	0.1477	0.4379

Note 1: PC= Project Control Capability, SC= Social Capital, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (Cost&Time) Performance, PS= Project Size.
Note 2: Critical t-values for a two-tailed test are 1.65 † (confidence level = 10%), 1.96 * (confidence level = 5%), 2.58 ** (confidence level = 1%), and 3.29 * (confidence level = 0.1%).**

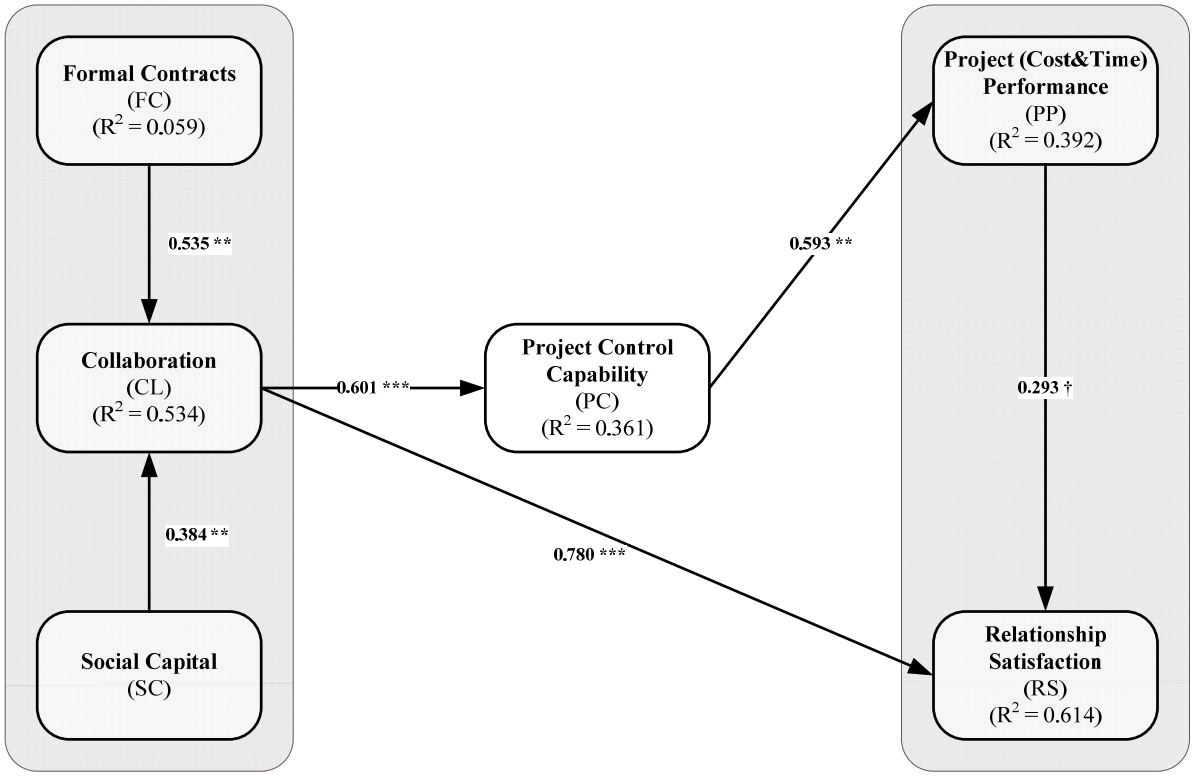

Figure 5-16 : Validated model (Australia)

5.6.2 Significance of mediation effects

As recommended by Hayes (2009), the bootstrapping method was used to analyze the intervening variable effects. Unlike the Sobel (1982) test, the bootstrapping approach makes no assumptions about the shape of the sampling distribution of the mediation effect or the variables' distribution, so it can be confidently applied to small sample sizes (Hair et al., 2014; Hayes, 2009). Furthermore, the bootstrapping method has higher levels of statistical power than the Sobel test that uses unstandardized path coefficients for running test statistics, particularly when it is applied to small sample sizes (Hair et al., 2014).

Following Mathieu and Taylor (2006) procedures (Figure 5-17), the hypothesized mediation effects were tested. 5000 bootstrap samples were used for running the bootstrapping procedure using SmartPLS software (Ringle et al., 2005).

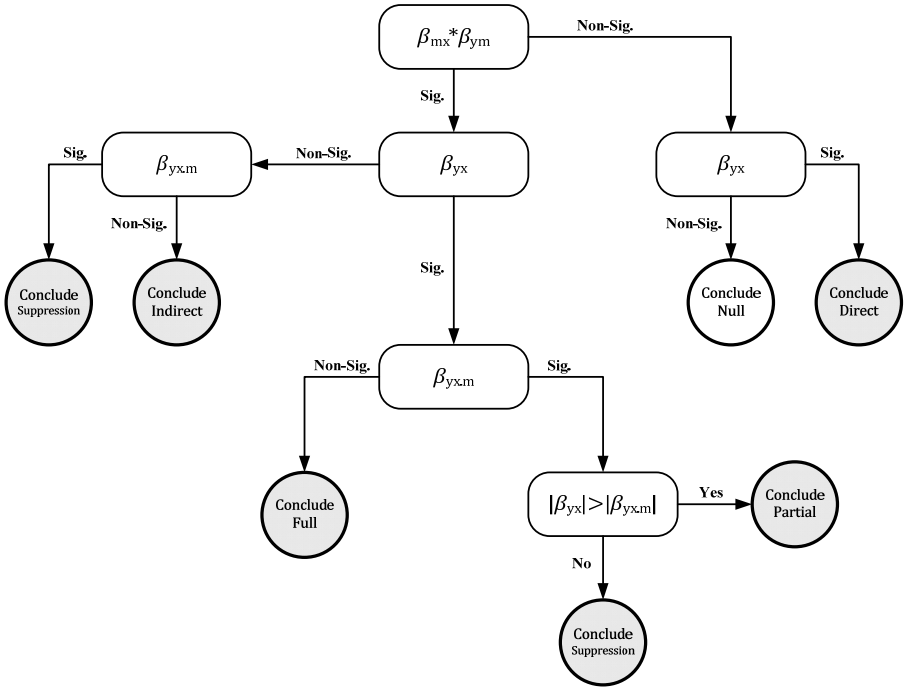

Figure 5-17 : Decision tree for evaluating different intervening effects

After carrying out the bootstrapping procedure, the standard deviation of $\beta_{mx} \times \beta_{ym}$ values was calculated, and then the following formula was used to calculate the t value for each hypothesized intervening effect.

$$t = \frac{\beta_{mx} \times \beta_{ym}}{STDEV(\beta_{mx} \times \beta_{ym})} \qquad 5\text{-}19$$

Where, β_{mx} represents the β coefficient for the relationship between the exogenous construct x and the intervening construct m, and similarly, β_{ym} refers to the β coefficient associated with the relationship between the intervening construct m and endogenous construct y, and finally, $STDEV(\beta_{mx} \times \beta_{ym})$ represents the standard deviation of the products of β_{mx} and β_{ym} for all 5000 bootstrap samples. Table 5-12 and Table 5-13 show the results of the test and the inferences drawn from the outcomes.

Table 5-12 : Significance of intervening effects (Iran)

Hypothesis	Exogenous construct (x)	Endogenous construct (y)	Intervening construct (m)	STDEV of bootstrapped indirect effects ($\beta_{mx} \times \beta_{ym}$)	$\beta_{mx} \times \beta_{ym}$	Bootstrap t-statistic	Is β_{yx} significant?	Is $\beta_{yx.m}$ significant?	Inference
H5	FC	PC	CL	0.0627	0.123	1.96 *	Yes	No	Full mediation
H6	SC	PC	CL	0.0493	0.132	2.68 **	No	No	Indirect effect
H7a$_2$	CL	RS	PC	0.0470	0.084	1.81 †	Yes	No	Full mediation

Note 1: PC= Project Control Capability, SC= Social Capital, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (Time&Cost) Performance.
Note 2: Critical t-values for a two-tailed test are 1.65 † (confidence level = 10%), 1.96 * (confidence level = 5%), 2.58 ** (confidence level = 1%), and 3.29 * (confidence level = 0.1%).**

Table 5-13 : Significance of intervening effects (Australia)

Hypothesis	Exogenous construct	Endogenous construct	Intervening construct	STDEV of bootstrapped indirect effects ($\beta_{mx} \times \beta_{ym}$)	$\beta_{mx} \times \beta_{ym}$	Bootstrap t-statistic	Is β_{yx} significant?	Is $\beta_{yx.m}$ significant?	Inference
H5	FC	PC	CL	0.1661	0.292	1.75 †	Yes	No	Full mediation
H6	SC	PC	CL	0.0849	0.177	2.09 *	Yes	No	Full mediation
H7b$_2$	SC	RS	CL	0.1161	0.300	2.58 **	No	No	Indirect effect
H8b	FC	RS	CL	0.1774	0.417	2.35 *	No	No	Indirect effect
H9b	CL	PP	PC	0.1388	0.356	2.57 *	No	No	Indirect effect

Note 1: PC= Project Control Capability, SC= Social Capital, CL= Collaboration, FC= Formal Contract, RS= Relationship Satisfaction, PP= Project (Time&Cost) Performance.
Note 2: Critical t-values for a two-tailed test are 1.65 † (confidence level = 10%), 1.96 * (confidence level = 5%), 2.58 ** (confidence level = 1%), and 3.29 * (confidence level = 0.1%).**

5.6.3 Coefficient of determination (R^2 level)

The R^2 value predicts the amount of variance in the outcome variable that can be explained by all of the predictor variables linked to it. The R^2 value ranges between 0 and 1 with higher values representing higher levels of predictive accuracy.

In this study, the R^2 values were calculated using SmartPLS software (Ringle et al., 2005). Following Falk and Miller (1992), an F test was also undertaken to examine the significance of the R^2 values, by using the following formula:

$$F = \frac{R^2/m}{(1-R^2)/(N-m-1)} \qquad 5\text{-}20$$

Where N is the total number of the sample size, m is the number of predictors of the construct, and F is the distribution of R^2 values with respect to the degrees of freedom, m and $(N-m-1)$.

Table 5-14 : Results of F-test for significance of R^2 (Iran)

	R^2	N	m	F	Significance level
FC	0.009	73	1	0.64	0.425
CL	0.274	73	2	13.21	0.000
PC	0.149	73	1	12.42	0.001
PP	0.107	73	5	1.61	0.171
RS	0.433	73	6	8.40	0.000

Note: CL= Collaboration, PC= Project Control Capability, RS= Relationship Satisfaction, PP= Project (Time&Cost) Performance.

Table 5-15 : Results of F-test for significance of R^2 (Australia)

	R^2	N	m	F	Significance level
FC	0.059	38	1	2.26	0.142
CL	0.534	38	2	20.05	0.000
PC	0.361	38	1	20.34	0.000
PP	0.392	38	5	4.13	0.005
RS	0.614	38	6	8.22	0.000

Note: CL= Collaboration, PC= Project Control Capability, RS= Relationship Satisfaction, PP= Project (Time&Cost) Performance.

As recommended by Falk and Miller (1992), any R^2 values of less than 0.10 are problematic, because they indicate that the predictor variables provided almost no information about the outcome variable and are therefore meaningless, especially, where there are many predictor variables explaining an outcome variable.

The R^2 values and F test results are summarized in Table 5-14 and Table 5-15. The results from Iranian data set show that the R^2 values for all endogenous constructs were substantially significant ($p \leq 0.001$), except for FC and PP. It means that SC is not a significant predictor for FC and it is also seen that the model cannot significantly predict the changes in PP. In other words, there are other factors that are influencing these two constructs that have not included in the model. The same inference can be made regarding the strength of Australian model in prediction of FC ($p > 0.1$).

The R^2 values for all other constructs are above 10%, indicating that the model explain an acceptable level of variance for all the constructs. In other words, most of the hypothesized relationships are apparently informative in the model. PC in the Iranian model is marginally above 0.10 ($R^2 = 0.149$), but because this construct is only predicted by one construct (CL), no concern is raised about the explanatory power of the model.

5.7 Chapter summary

In this chapter the structural and measurement models were developed, tested, modified, and validated. When developing the structural model, the main constructs of the research were defined and except Social Capital (SC) which was modeled as a second-order construct, the other factors such as Formal Contract (FC), Collaboration (CL), Project Control Capability (PC), Project Performance (PP), Relationship Performance (RP), and Project Size (PS) were designed as single-order constructs. After this, the links between the constructs were determined based on the research hypotheses and then the relationships between each individual construct and its indicators were examined to determine whether the reflective or formative measurement model was better at describing these relationships. Accordingly, the reflective measurement model was selected for all constructs to represent their relationships with their relevant indicators. Once the structural and measurement models had been developed, the data preparation and examination process was undertaken. Through this process the outliers and missing data from both data sets were treated and the data was prepared for the next stages where the measurement and structural models were being

evaluated. Based on outputs drawn from SmartPLS software (Ringle et al., 2005), the convergent validity and discriminant validity of the measurement models were examined and some indicators were removed from the relevant measurement models. The structural model was then evaluated and the hypothesized relationships were tested, and the validated models were presented.

CHAPTER SIX: RESULTS AND FINDINGS

- ***Introduction***
- ***Validating threats***
- ***Results and findings***
- ***Chapter summary***

6.1 Introduction

In this chapter, the findings of the research are explained and discussed. Before presenting the results, some validating threats that are associated with this type of research are carefully examined. Then, all the research hypotheses are examined to see whether they are supported or rejected and explanations regarding the findings are presented.

6.2 Validating threats

6.2.1 Common method bias

As mentioned earlier, data collection was based on self-report method and as a result the study results may be threaten by method biases, called common method bias. That is, when all the dependent and independent variables are measured through the same source, it is more likely to have bias in correlations between variables, because any defect in that source may contaminate all the measures in the same way, and accordingly, the correlation may not be originally based on overlap in variance of the measures themselves. As a result, the correlation could inaccurately lead us to infer a substantive relationship (Podsakoff & Organ, 1986). Therefore, the most critical problem in the use of self-report data is to identify the likely causes of false covariance between self-report measures of distinct variables. Generally, there are two primary ways to control common method bias: (1) the design of the study's procedures as ex-ante remedies; and/or (2) statistical controls as ex-post remedies (Podsakoff, MacKenzie, Lee, & Podsakoff, 2003).

Procedural remedies

As articulated by Podsakoff et al. (2003), to control the method variance through procedural remedies, it is necessary to identify common characteristics of independent and dependent variables that are likely to contribute to variance bias and try to eliminate or minimize their effects through the design of the study. There are some recognized sources of bias, including: (1) the respondent; (2) contextual cues present in the measurement environment or within the questionnaire itself; and/or (3) the specific wording and format of the questionnaire (Podsakoff et al., 2003).

To address the first issue, it is advised to obtain measures of independent and dependent variables from different sources. This procedure makes it impossible for a person to rate the measures based on the presumed relationships between variables. In spite of the obvious advantages of this approach, it is not feasible to be applied in all types of studies. For example, in the case of present study, if I wanted to use this procedure, it was required to find at least two persons on each project to link the data obtained from these sources. This method can result in the loss of information when only one of the expected respondents participates in the survey and as a result, it may have significant effect on response rate. Additionally, it may require considerably more time, effort, and/or cost (Podsakoff et al., 2003), especially in a multi-national study. Given these disadvantages, this study did not use this procedure. As advised by Podsakoff et al. (2003) and Peterson (2000), this study used alternative methods such as counterbalanced question order and improved scale items to overcome the threat of common method bias. Regarding the former method, the questions related to different constructs were randomly ordered in the questionnaire to reduce the effects of question

context or item embeddedness on responses. With respect to the latter method, I tried to improve the construction of the measures by considering following advices from Podsakoff et al. (2003): (1) removing ambiguous or unfamiliar terms; (2) avoiding vague concepts; (3) keeping questions simple, specific, and concise; and (4) avoiding double-barreled questions.

Statistical remedies

Although using procedural remedies may minimize the probability of common method bias, they may not totally eliminate the problem. As a result, it is advised to use one the statistical remedies that are available (Podsakoff et al., 2003). One of the most widely used statistical techniques is Harman's single-factor test. In this technique, all of the variables are loaded into an exploratory factor analysis and the un-rotated factor solution is examined to find the number of factors that are necessary to explain the variance in the variables. If the results show that one general factor accounts for the majority of the covariance among the measures, it would be the sign of the presence of common method bias (Podsakoff et al., 2003). Accordingly, this technique was applied for both Iranian and Australian data sets.

As shown in Tables 6-1and Table 6-2, the first factor extracted using principal axis factoring without rotation, accounts for 21% and 28% of the overall variance in Iranian and Australian data sets, respectively, showing that there is no general factor accounting for a majority of the variance and it is therefore unlikely that common method variance affects the results (Podsakoff & Organ, 1986). Based on the test results, I conclude that common method bias is not a critical issue for this study.

Table 6-1 : Total variance explained for Harman's single factor test (Iran)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.578	22.681	22.681	5.993	20.666	20.666
2	3.685	12.707	35.388			
3	2.630	9.070	44.459			
4	2.021	6.970	51.429			
5	1.948	6.717	58.146			
6	1.357	4.680	62.826			
7	1.223	4.218	67.044			
8	1.119	3.859	70.903			
9	.969	3.341	74.243			
10	.890	3.067	77.311			
11	.792	2.730	80.041			
12	.743	2.562	82.603			
13	.666	2.298	84.902			
14	.621	2.142	87.044			
15	.549	1.894	88.938			
16	.455	1.568	90.505			
17	.389	1.341	91.846			
18	.382	1.316	93.162			
19	.313	1.080	94.242			
20	.304	1.049	95.291			
21	.278	.957	96.249			
22	.243	.838	97.086			
23	.210	.723	97.809			
24	.144	.497	98.306			
25	.138	.477	98.783			
26	.113	.389	99.172			
27	.088	.302	99.474			
28	.082	.283	99.756			
29	.071	.244	100.000			

Extraction Method: Principal Axis Factoring

Table 6-2 : Total variance explained for Harman's single factor test (Australia)

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	8.908	29.694	29.694	8.315	27.716	27.716
2	4.390	14.633	44.327			
3	2.839	9.463	53.790			
4	2.257	7.522	61.312			
5	1.819	6.065	67.377			
6	1.392	4.641	72.018			
7	1.287	4.289	76.308			
8	1.086	3.620	79.927			
9	.814	2.713	82.640			
10	.684	2.281	84.921			
11	.679	2.263	87.184			
12	.532	1.772	88.956			
13	.491	1.635	90.591			
14	.440	1.467	92.058			
15	.397	1.322	93.380			
16	.323	1.078	94.458			
17	.310	1.033	95.492			
18	.254	.848	96.339			
19	.207	.690	97.029			
20	.186	.618	97.648			
21	.158	.528	98.175			
22	.110	.366	98.541			
23	.106	.354	98.894			
24	.101	.337	99.232			
25	.068	.227	99.459			
26	.062	.206	99.665			
27	.053	.176	99.841			
28	.023	.077	99.918			
29	.017	.055	99.973			
30	.008	.027	100.000			

Extraction Method: Principal Axis Factoring

6.2.2 Collinearity assessment

The collinearity problem comes into existence when there is a strong correlation between two or more predictors. In extreme conditions in which one predictor is a perfect linear combination of other predictor(s), perfect collinearity will be produced. Perfect collinearity between two predictors makes it impossible to obtain unique estimates of the regression coefficients, because there are infinite numbers of possibilities for combinations of

coefficients which work equally well (Field, 2013). Although perfect collinearity is rare in real-life data, less than perfect collinearity is virtually inevitable and high level of collinearity may bias model estimates (Field, 2013; Hair et al., 2014).

For evaluating the existence of collinearity in Iranian and Australian structural models, variance inflation factor (VIF) was calculated using IBM SPSS 21. The VIF indicates the strength of one predictor's linear relationship with the other predictor(s). Tolerance is another factor for assessing the collinearity which is VIF's reciprocal value (1/VIF). As noted by Hair et al. (2014), if the largest VIF is greater than 5 (tolerance is below 0.2), then there is a cause for concern and some action must be undertaken to treat the problem. There are various remedies for eliminating the collinearity concern including: (1) to delete the problematic construct, (2) to merge predictors into a single construct, or (3) to create higher order constructs.

As indicated in Tables 6-3 through 6-8, the collinearity assessment was performed for those constructs that were simultaneously cooperating with each other to predict another construct. For example, in the Iranian structural model, Collaboration (CL) is supposed to be predicted by Social Capital (SC) and Formal Contracts (FC). As a result, possibility of collinearity between Social Capital (SC) and Formal Contracts (FC) was checked and because VIF was less than 5, the probability for collinearity problem was rejected. Similarly, collinearity for other constructs was tested. Based on results, the highest VIF in this analysis was less than the defined threshold (VIF = 5), and thus, it is unlikely to cause collinearity concern. The same procedure was undertaken for Australian structural model and no sign for the presence of collinearity was observed.

Table 6-3 : Collinearity statistics for FC and SC as predictors of CL (Iran)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	CL	.869	1.151
	SC	.869	1.151
2**	CL	.889	1.125
	FC	.889	1.125

Note: FC= Formal Contracts, SC= Social Capital, CL= Collaboration.
* **Dependent Variable: FC**
** **Dependent Variable: SC**

Table 6-4 : Collinearity statistics for SC, FC, CL, PC, and PS as predictors of PP (Iran)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	CL	.770	1.299
	FC	.870	1.149
	PC	.855	1.170
	PP	.988	1.012
	PS	.931	1.074
2**	CL	.728	1.373
	PC	.870	1.150
	PP	.922	1.084
	PS	.931	1.074
	SC	.806	1.240
3***	PC	.912	1.097
	PP	.947	1.056
	PS	.982	1.019
	SC	.914	1.094
	FC	.933	1.071
4****	PP	.922	1.084
	PS	.947	1.056
	SC	.807	1.239
	FC	.886	1.129
	CL	.725	1.379
5*****	PP	.927	1.078
	SC	.803	1.245
	FC	.867	1.153
	CL	.713	1.402
	PC	.866	1.155

Note: SC= Social Capital, CL= Collaboration, FC= Formal Contract, PC= Project Control capability, PP= Project (Time&Cost) Performance, PS= Project Size.
* **Dependent Variable: SC**
** **Dependent Variable: FC**
*** **Dependent Variable: CL**
**** **Dependent Variable: PC**
***** **Dependent Variable: PS**

Table 6-5 : Collinearity statistics for SC, FC, CL, PC, PS, and PP as predictors of RS (Iran)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	PP	.666	1.501
	FC	.850	1.177
	CL	.694	1.441
	PC	.775	1.290
	PS	.931	1.074
	RS	.566	1.766
2**	PP	.663	1.507
	CL	.699	1.430
	PC	.801	1.248
	PS	.931	1.074
	RS	.549	1.821
	SC	.763	1.310
3***	PP	.707	1.415
	PC	.799	1.252
	PS	.980	1.020
	RS	.568	1.761
	SC	.827	1.210
	FC	.927	1.079
4****	PP	.675	1.482
	PS	.944	1.059
	RS	.590	1.694
	SC	.763	1.311
	FC	.878	1.139
	CL	.660	1.516
5*****	PP	.664	1.506
	RS	.538	1.859
	SC	.763	1.311
	FC	.849	1.178
	CL	.675	1.483
	PC	.786	1.272
6******	RS	.751	1.332
	SC	.770	1.299
	FC	.853	1.173
	CL	.685	1.459
	PC	.792	1.262
	PS	.936	1.069

Note: SC= Social Capital, CL= Collaboration, FC= Formal Contract, PC= Project Control capability, PP= Project (Time&Cost) Performance, RS= Relationship Satisfaction, PS= Project Size.

* **Dependent Variable: SC**

** **Dependent Variable: FC**

*** **Dependent Variable: CL**

**** **Dependent Variable: PC**

***** **Dependent Variable: PS**

****** **Dependent Variable: PP**

Table 6-6 : Collinearity statistics for FC and SC as predictors of CL (Australia)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	CL	0.791	1.264
	SC	0.791	1.264
2**	CL	0.696	1.436
	FC	0.696	1.436

Note: FC= Formal Contracts, SC= Social Capital, CL= Collaboration.
* **Dependent Variable: FC**
** **Dependent Variable: SC**

Table 6-7 : Collinearity statistics for SC, FC, CL, PC, and PS as predictors of PP (Australia)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	CL	.607	1.649
	FC	.651	1.537
	PS	.805	1.242
	PP	.837	1.194
	PC	.719	1.390
2**	CL	.696	1.436
	PS	.789	1.268
	PP	.837	1.195
	PC	.627	1.595
	SC	.653	1.531
3***	PS	.769	1.300
	PP	.841	1.189
	PC	.622	1.608
	SC	.730	1.370
	FC	.835	1.198
4****	PS	.818	1.222
	PP	.893	1.119
	SC	.723	1.383
	FC	.628	1.592
	CL	.520	1.924
5*****	PP	.951	1.051
	SC	.641	1.560
	FC	.626	1.599
	CL	.509	1.965
	PC	.648	1.543

Note: SC= Social Capital, CL= Collaboration, FC= Formal Contract, PC= Project Control capability, PP= Project (Time&Cost) Performance, PS= Project Size.
* **Dependent Variable: SC**
** **Dependent Variable: FC**
*** **Dependent Variable: CL**
**** **Dependent Variable: PC**
***** **Dependent Variable: PS**

Table 6-8 : Collinearity statistics for SC, FC, CL, PC, PS, and PP as predictors of RS (Australia)

Model		Collinearity Statistics	
		Tolerance	VIF
1*	PP	.769	1.300
	FC	.631	1.586
	CL	.412	2.426
	PC	.698	1.433
	PS	.802	1.246
	RS	.520	1.922
2**	PP	.771	1.297
	CL	.507	1.974
	PC	.618	1.618
	PS	.788	1.270
	RS	.533	1.874
	SC	.649	1.541
3***	PP	.803	1.245
	PC	.597	1.675
	PS	.766	1.305
	RS	.716	1.397
	SC	.682	1.465
	FC	.815	1.227
4****	PP	.799	1.252
	PS	.810	1.234
	RS	.531	1.883
	SC	.716	1.397
	FC	.616	1.623
	CL	.370	2.703
5*****	PP	.875	1.143
	RS	.522	1.917
	SC	.640	1.561
	FC	.611	1.637
	CL	.369	2.707
	PC	.630	1.587
6******	RS	.566	1.766
	SC	.612	1.633
	FC	.597	1.676
	CL	.386	2.588
	PC	.620	1.613
	PS	.873	1.146

Note: SC= Social Capital, CL= Collaboration, FC= Formal Contract, PC= Project Control capability, PP= Project (Time&Cost) Performance, RS= Relationship Satisfaction, PS= Project Size.

* **Dependent Variable: SC**

** **Dependent Variable: FC**

*** **Dependent Variable: CL**

**** **Dependent Variable: PC**

***** **Dependent Variable: PS**

****** **Dependent Variable: PP**

6.3 Results and findings

After addressing the validity threats, in this section the research results are discussed and the inferences regarding the findings of the research are drawn.

6.3.1 Interactions between governance mechanisms

Hypotheses 1, 2 and 3 were related to the relationships between governance mechanisms. Based on hypothesis 1, I contended that social capital has negative impact on the use of formal contract. Based on the results, no evidence was found for substitutive relationship between formal contract and social capital in either context ($p>0.1$). This result contradicts previous findings on substitutive/complementary relationship between prior ties/shared norms/trust and formal contract (e.g., Kadefors, 2004; Uzzi, 1997). However, it is consistent with recent studies that found non-significant relationship between prior ties and formal contract (e.g., Rhee et al., 2014).

In hypothesis 2, I predicted that formal contract enhances collaborations between project partners. The results showed that the impact is positive and significant with $p<0.01$ for both Iranian and Australian cases. Therefore, H2 is supported in both models. The results indicate that cultural differences and contract enforceability does not change the significance of contract's impact on collaborations. In other words, contractual arrangements can provide institutional framework for cooperation among project partners and promote collaborations, even if the institutional environment is different. It can be explained by referring to the nature of the construction projects' activities that are highly team-based and collaboration and

communication has widely been accepted as a success factor in this context (Jha & Iyer, 2006; S. R. Thomas et al., 1998), and as a result, does not need great pressure to be enforced.

According to hypothesis 3, I expected that level of social capital contribute to collaborations among project partners. As shown in Table 6-9, the impact of social capital on collaboration is positive and significant with $p<0.001$ for Iranian data and $p<0.01$ for Australian data. Thus, H3 is also supported in both Iranian and Australian contexts. This result parallels previous findings on the role of social capital (e.g., prior ties, shared norms, trust) in promoting social interactions and information exchange among partner (Chua et al., 2012; Kirsch et al., 2010).

Table 6-9 : Hypothesis testing results for H1, H2, and H3

Hypothesis	Path	Path coefficient	
		Iran	Australia
H1	SC -> FC	0.093	0.242
H2	FC -> CL	0.364 **	0.535 **
H3	SC -> CL	0.343 ***	0.385 **

6.3.2 The impact of governance mechanisms on project control capability

Hypotheses 4 through 6 refer to the impact of governance mechanisms on project control capability. Based on hypothesis 4, I predicted that collaboration among project partners enhances project control capability of the partners. As shown in Table 6-10, the impact of collaboration on project control capability is positive and very significant with $p<0.001$ for both Iranian and Australian cases. These results support L. Liu and Zhu (2007)'s proposition about the continuous increase in task programmability and outcome measurability throughout the project life cycle. That is, as the project progresses, effective communications

among partners promotes clarity in the scope and objectives of the project as well as construction processes and leads to more goal congruency. As a result, expected behavior become more understandable and observable, and desired outcomes will be more explicit and measurable.

Table 6-10 : Hypothesis testing results for H4

Hypothesis	Path	Path coefficient	
		Iran	Australia
H4	CL -> PC	0.386 ***	0.601 ***

In hypothesis 5, I contended that collaboration mediates the positive impact of formal contract on project control capability. Consistent with this hypothesis, the results from the analysis of Iranian and Australian datasets shows that the relationship between formal contract and project control capability is fully mediated by collaboration (Table 6-11). These results are consistent with previous findings in construction research which showed that using formal contract is not sufficient for exercising control, but the contract provisions should be communicated and interpreted through effective information exchange and interactions between project managers and project team members (Rahman & Kumaraswamy, 2002).

Hypothesis 6 predicted the mediation effect of collaboration on the relationship between social capital and project control capability. As shown in Table 6-11, the results support the full mediation in Australian context, and indirect effect in Iranian projects. These findings support previous arguments in the literature about the importance of continuous collaboration between partners for maintaining trust and commitment (Adler & Kwon, 2002).

Prior studies within organizational control domain suggest that control capabilities of the partners (e.g., task programmability, outcome measurability) play critical role in the choice

of governance mechanisms. Within this tradition, however, the impact of governance mechanisms on developing these capabilities was ignored. In this study, I examined this effect and the results showed that all the three governance mechanisms (e.g., formal contract, social capital, collaborations) significantly contribute to project control capability of the partners.

Table 6-11 : Hypothesis testing results for H5 and H6

Hypothesis	Exogenous construct (x)	Endogenous construct (y)	Intervening construct (m)	Bootstrap t-statistic		Inference	
				Iran	Australia	Iran	Australia
H5	FC	PC	CL	1.96 *	1.75 †	Full mediation	Full mediation
H6	SC	PC	CL	2.68 **	2.09 *	Indirect effect	Full mediation

6.3.3 The impact of governance mechanisms on relationship satisfaction

Hypotheses 7a,b and 8a,b refer to the impact of governance mechanisms on relationship satisfaction. In H7a$_{1,2}$, I expected that in countries with collectivistic culture and low contract enforceability, while social capital has direct impact on relationship satisfaction, the impact of collaboration on relational satisfaction is mediated by project control capability. As shown in Table 5-12 and Table 5-13, these impacts are both significant with $p<0.05$ and $p<0.1$; therefore H7a$_{1,2}$ are supported. The results are consistent with the cross-cultural literature that showed how collectivists treat differently with out-groups and in-groups (C. C. Chen et al., 1998; Triandis, 1995). That is, when social capital between partners is high, this strong relationship by itself provides satisfaction; but when social capital is low, the partners treat each other as out-groups and therefore, their collaboration should be effective in terms of increasing their control capability to make them satisfied.

In $H7b_{1,2}$, I predicted that in individualist countries with high contract enforceability, collaboration has direct impact on relationship satisfaction and also mediates the relationship between social capital and relationship satisfaction. The results supported $H7b_1$ and showed that collaboration significantly impacts on relationship satisfaction ($p<0.001$). It was also found that social capital indirectly impacts on relationship satisfaction through collaboration ($p<0.01$).

These results are consistent with previous cross-cultural research that shows while collectivists value trustful and friendly relationships, individualists prefer to have reciprocal relationships with their partners.

In H8a, I expected to have non-significant relationship between formal contract and relationship satisfaction in collectivistic culture with low contract enforceability, and the results supported this non-significant relationship ($p>0$). Consistent with H8b, the results showed that in countries with individualistic culture and high contract enforceability, contract has indirect effect on relationship satisfaction through collaboration ($p<0.05$).

These results are also consistent with cross-cultural literature that regards contract enforceability and culture as contingent factors for the efficacy of formal contracts.

Table 6-12 : Hypotheses testing results for $H7a_1$, $H7b_1$ and H8a

Hypothesis	Path	Path coefficient	
		Iran	Australia
$H7a_1$	SC -> RS	0.236 *	-
$H7b_1$	CL -> RS	-	0.780 ***
H8a	FC -> RS	-0.176	-

Table 6-13 : Hypotheses testing results for $H7a_2$, $H7b_2$ and H8b

Hypothesis	Exogenous construct (x)	Endogenous construct (y)	Intervening construct (m)	Bootstrap t-statistic		Inference	
				Iran	Australia	Iran	Australia
$H7a_2$	CL	RS	PC	1.81 †	-	Full mediation	-
$H7b_2$	SC	RS	CL	-	2.58 **	-	Indirect effect
H8b	FC	RS	CL	-	2.35 *	-	Indirect effect

6.3.4 The impact of governance mechanisms on project (time&cost) performance

Hypotheses 9a,b and 10a,b refer to the impact of governance mechanisms on project (time&cost) performance. Based on H9a, I postulated that in collectivistic countries with low contract enforceability, social capital has positive impact on project (time&cost) performance. As shown in Table 6-14, this hypothesis was supported ($p<0.05$). The results also supported H9b ($p<0.05$) and showed that in individualistic cultures with high contract enforceability the impact of collaboration on project (time&cost) performance is indirect and goes through project control capability.

Based on H10a, formal contract has non-significant impact on project (time&cost) performance. The results supported this hypothesis ($p>0$). In H10b, I postulated that in

individualistic cultures with high contract enforceability, formal contract has significant impact on project (time&cost) performance. This hypotheses was rejected (p>0). Although this finding contradicts some previous research which showed strong association between formal contract and exchange performance in countries with high contract enforceability, it supports recent research into the construction industry that rejected the direct impact of contract on project performance and asserted that collaboration mediates this relationship (L. Chen & Manley, 2014).

Table 6-14 : Hypotheses testing results for H9a, H10a, and H10b

Hypothesis	Path	Path coefficient	
		Iran	Australia
H9a	SC -> PP	0.248 *	-
H10a,b	FC -> PP	0.142	0.004

Table 6-15 : Hypotheses testing results for H9b

Hypothesis	Exogenous construct (x)	Endogenous construct (y)	Intervening construct (m)	Bootstrap t-statistic		Inference	
				Iran	Australia	Iran	Australia
H9b	CL	PP	PC	-	2.57 *	-	Indirect effect

6.4 Chapter summary

This chapter reported the research results and main findings of this thesis. First validating threats were examined. As such, common method bias and collinearity problems were tested and no sign of concern was found. Then, the results for hypothesis testing were presented.

CHAPTER SEVEN: CONCLUSIONS

- ***Introduction***
- ***Summary of the findings***
- ***Theoretical implications***
- ***Managerial implications***
- ***Limitations and future research***

7.1 Introduction

This chapter draws conclusions based on the results of the analyses. It begins with a summary of the main findings, discusses implications for theory and practice, highlights the limitations of this study, suggests future research directions, and finally ends with drawing concluding remarks.

7.2 Summary of the findings

The main purpose of this study was to develop the IORs literature on the choice and effects of governance mechanisms in the project context. Governance mechanisms are necessary tools for regulating the complex transactions between partners to achieve project objectives. The efficacy of governance mechanisms—contractual vs. relational mechanisms—under different conditions for fulfilling the project objectives has been the subject of intense debate over recent decades. However, there are still ambiguities and inconsistencies in the literature on the choice and effects of governance mechanisms that need further exploration. To fulfill this purpose, an extensive review of literature was undertaken and three gaps were identified:

(1) ambiguous definition of relational governance mechanisms and inconsistent findings on the interactions between relational governance and formal contracts in explaining exchange performance;

(2) how project control capability of partners interacts with governance mechanisms and jointly impacts on exchange performance;

(3) how culture and contract enforceability can influence the choice and effects of governance mechanisms in explaining exchange performance.

Addressing the abovementioned gaps and contributing to the literature, social capital (e.g., prior ties, shared norms, trust) as ex-ante relational governance and collaboration (e.g., information exchange, joint actions) as ex-post relational governance were differentiated and examined under two distinct constructs, a new construct of 'project control capability' was introduced, and a comparative survey of executive/project managers was conducted in Iran and Australia where the context exhibits distinctively contrasting cultural and legal attributes.

On the interactions between governance mechanisms, no evidence was found for a substitutive relationship between formal contract and social capital in either context. This result contradicts previous findings on substitutive relationship between prior ties/shared norms/trust and formal contract. However, it is consistent with recent studies that found non-significant relationship between prior ties and formal contract (Rhee et al., 2014). In contrast, the results showed that formal contract positively impacts on collaboration that supports the complementary relationship. The results also revealed that social capital motivates collaboration between partners that is consistent with previous research which showed how the facilitating role of social capital promoted cooperation between partners.

On the impact of governance mechanisms on performance in project context, 'project control capability' was introduced to explain how the capability of partners in exercising governance mechanisms impacts on the choice and effects of governance mechanisms in

explaining exchange relationships. With regard to the impact of governance mechanisms on relationship satisfaction, the research found that while social capital is the main contributor in collectivist cultures, collaboration plays a critical role in individualistic societies. These results are consistent with previous cross-cultural research that shows while collectivists value trustful and friendly relationships, individualists prefer to have reciprocal relationships with their partners. The results also suggested that the impact of collaboration on relationship satisfaction is mediated by 'project control capability' in collectivistic cultures. This supports for the argument from cross-cultural literature that when collectivists work with out-groups, they become conservative in their interactions and collaboration with the new partner, unless they can control the relationships. It was also found that in individualistic cultures collaboration mediates the impact of social capital on relationship satisfaction. In other words, individualist partners value trust and friendship, if it leads to reciprocity. Additionally, the results showed that formal contract has an indirect effect on relationship satisfaction through collaboration in individualistic countries with high contract enforceability. As expected, no evidence was found for a relationship between contract and relationship satisfaction in collectivistic cultures with low contract enforceability. These results are also consistent with cross-cultural literature that regards contract enforceability and culture as contingent factors for the efficacy of formal contracts.

On the impact of governance mechanisms on project (time&cost) performance, the results showed that formal contract has no significant impact on project (time&cost) performance in any of the two contexts. Although part of this finding contradicts some previous research which showed strong association between formal contract and exchange

performance in countries with high contract enforceability, it supports recent research into the construction industry that rejected the direct impact of contract on project performance and asserted that collaboration mediates this relationship. Moreover, the results suggested that where in collectivistic countries with low contract enforceability, social capital plays the main role in enhancing project (time&cost) performance, in individualistic countries with high contract enforceability, collaboration has an indirect impact on project (time&cost) performance through project control capability. This finding reveals the important role of social capital in countries with a collectivistic culture and low contract enforceability and the pivotal role of collaboration in individualistic cultures with high contract enforceability in regulating exchange relationships. A summary of the main findings of this thesis are presented in table 7-1.

Table 7-1 : Summary of the main findings

Interactions between governance mechanisms
• In neither collectivistic nor individualistic cultures, social capital has significant impact (positive or negative) on formal contract. • Formal contract and social capital motivate collaboration.
The impact of governance mechanisms on project control capability
• All the three governance mechanisms (e.g., formal contract, social capital, collaboration) contribute to the improvement of project control capability. • Collaboration plays the primary role and mediates the impact of formal contract and social capital on project control capability
The impact of governance mechanisms on relationship satisfaction
• While social capital plays the key role in collectivistic cultures, collaboration is the critical mechanism in individualistic societies. • In countries where the culture is collectivistic, the positive impact of collaboration on relationship satisfaction is mediated by project control capability. • In countries where the culture is individualistic, social capital has indirect effect on relationship satisfaction through collaboration. • While formal contract has non-significant impact on relationship performance in countries with collectivistic cultures and low contract enforceability, in countries where the culture is individualistic and the contract enforceability is high, formal contract has indirect effect on relationship satisfaction through collaboration.
The impact of governance mechanisms on project (time&cost) performance
• In countries where the culture is collectivistic and the contract enforceability is low, o Social capital has positive impact on project (time&cost) performance. o Formal contract and collaboration have non-significant impact on project (time&cost) performance. • In countries where the culture is individualistic and the contract enforceability is high, o Collaboration has positive impact on project (time&cost) performance through project control capability. o Formal contract and social capital have non-significant impact on project (time&cost) performance.

7.3 Theoretical implications

The findings of this study make multiple contributions to the IORs governance and project management literature. First, drawing on social capital and social exchange theories, this study differentiated between social capital (e.g., prior ties, shared norms, and trust) as ex-ante relational governance and collaboration (e.g., information exchange, joint actions) as ex-post relational governance and investigated the distinct roles of these relational mechanisms in regulating exchange relationships. Inconsistencies in the definition and measurement of

relational governance mechanisms in previous IORs literature have contributed to inconsistent findings on the interactions between contractual and relational governance mechanisms and made it difficult to accumulate and develop knowledge based on the previous work. For example, Lui and Ngo (2004) considered goodwill trust as a relational governance mechanism and their results supported the substitutive effect of relational governance on formal contracts. In contrast, Poppo and Zenger (2002) examined the role of relational governance by measuring the level of trust and shared goals between partners as well as their joint collaborations during the exchange and found that relational mechanisms and formal contacts are complementary. One of the main criteria for conceptualizing and measuring relational governance mechanisms can be the nature of the mechanisms. As such, differentiating between the social bonds, norms and trust developed prior to the collaboration, and information exchange, joint actions and social exchanges that take place during the new exchange relationships can be helpful. The results confirmed that social capital and collaboration act differently in their interactions with formal contract and also in explaining project performance. This clarification can provide a basis for future research in IORs governance field to distinguish these two relational governance mechanisms regarding measurement and examination. This is consistent with the research in sociology and psychology that differentiates between trust and social exchanges by referring to the former as the main motivator for emergence of the latter (Coleman, 1990; Messick & Brewer, 1983). It also provides better understanding of the required conditions for applying each mechanism. Where using social capital as a governance mechanism needs social embeddeness, trust and strong ties between partners, collaboration requires communication capabilities and joint

problem solving, joint decision making, and conflict management competencies (Lee & Cavusgil, 2006).

Second, borrowing from organizational control theory, 'project control capability' was defined as a new construct to examine the mediating effect of control capability of project partners on the efficacy of governance mechanisms in explaining project performance. The research findings confirm the importance of project control capability in successful exercise of governance mechanisms. Prior studies in organizational control domain suggested that control capability of exchange partners is an antecedent for the adoption of different control mechanisms (Eisenhardt, 1985; Kirsch, 1996; Ouchi, 1977, 1979; Tuuli et al., 2010). The results of this study contribute to control theory by showing that control capability not only impacts on the efficacy of governance mechanisms, but also is affected and improved by using these mechanisms. In other words, there is two-way interaction between control capability and governance mechanisms; that is, where having control capabilities facilitates the successful exercise of governance mechanisms, applying governance mechanisms can promote control capabilities. This result also contributes to IORs governance and project management literature by highlighting the pivotal role of project control capability in relationship between collaboration and performance. Recent studies in construction industry suggested that collaboration mediates the impact of formal contract on project performance (e.g., L. Chen & Manley, 2014), however, they failed to differentiate between effective and ineffective collaboration. In line with previous research that recognized ineffective communications between the project partners as the main obstacle to success (Cheng et al., 2001; Thamhain, 1992; S. R. Thomas et al., 1998), my findings showed that if collaboration

between partners could not enhance project control capability, it would be ineffective. In plain words, project control capability mediates the impact of collaboration on project performance. Since the establishment and implementation of communication channels incur additional costs and require the project team to spend some time for interactions, ignoring these concerns may lead to ineffective communications and project failure.

Third, this study grounded its theoretical framing on institutional theory and Williamson (2000)'s social system model to examine the contingent effect of individualistic/collectivistic culture and high/low contract enforceability on the efficacy of governance mechanisms in regulating exchange relationships in different contexts. The results herein contribute to IORs governance literature and support Williamson (2000)'s assertion that the institutional environment—formal and informal institutions—impacts on the comparative effectiveness of governance mechanisms. It also extended and enriched TCE by providing empirical evidence for the contingent effect of contextual factors such as culture and contract enforceability on the efficacy of governance mechanisms. In countries with established formal institutions (e.g., rule of law, property rights) contracts are enforceable and can effectively be applied to safeguard the relationships against opportunistic behavior. In contrast, in countries where these formal constructs are weak, contract enforceability is low and consequently contract loses its efficacy in regulating exchange relationships (North, 1990). On the other hand, in individualistic cultures the attitudes towards inter-personal and inter-organizational relationships are mainly self-serving, so formal contract as a safeguarding tool and collaboration as a basis for reciprocity and gaining more resources are valued. On the contrary, in collectivistic cultures, loyalty and friendship between group members are prevailed, so

social capital is more effective. My results have an additional implication in cultural respect. Supporting recent findings in cross-cultural research (Huff & Kelley, 2005; Triandis, 1995), the results showed that in collectivistic cultures partners differentiate between in-groups and out-groups. While relationships with in-groups are mainly regulated by social capital, relationships with out-group members which lack social embeddedness are governed by collaboration. However, this collaboration should promote project control capability of the partners to lead to relationship satisfaction.

7.4 Managerial implications

Good governance of inter-organizational exchanges are critical for ensuring project success, so project partners should understand various governance mechanisms, especially the factors affecting the efficacy of these mechanisms. Choosing inappropriate governance arrangements may incur excessive costs or promote adversarial relationships and consequently cause project failure.

As the findings of this study revealed, formal contracts need to be supported with relational governance mechanisms to effectively govern the project. This is especially so with complex endeavors such as large construction projects where not only it is impossible to have a complete contract, but also it is unreasonable to rely on fixed and inflexible provisions. Relational governance mechanisms provide an effective alternative which focus on relational norms and joint actions. This study showed that relational governance mechanism is not uni-dimensional, but social capital as ex-ante relational governance and collaboration as ex-post

relational governance have distinctive functions in regulating exchange relationships in different contexts.

The results showed that social capital motivates collaboration between partners. Working with trusted partners with embedded relationships and shared norms encourages a trustful environment and reduces goal incongruence which balances expectations and mitigates the chance of opportunistic behavior, and consequently, encourages collaboration. Further, formal contracts require close collaboration to be effective. Drafting a detailed contract and leaving it aside without communicating its provisions (e.g., rights and responsibilities, project scope, project objectives, rewards and punishments, dispute resolution guidelines) does not guarantee its utility. Thus, implementing communications through information exchange and social interactions as well as joint actions appears to be a key success factor in this respect. However, the study showed that collaboration should be effective to impact on performance. As discussed in the literature, effective communication in terms of information exchange should be accurate, procedural, understandable, timely, and complete. In general, effective collaboration enhances the control capabilities of project partners and enables them to control project activities and project team members. Developing this capability approach can lead to the definition of core domains of competence for IORs in construction projects and the subsequent development of a competency framework that can help define pathways for attaining capabilities, and help practitioners outline their learning needs.

Another important implication of this thesis for practitioners is that it provides interesting insights into the choice and effects of different governance mechanisms in various

cultures and under different legal systems. Based on these findings, if the project context is a collectivistic culture with low contract enforceability, since social capital is the key enabler of project (time&cost) performance and relationship satisfaction in this context, if the partners are new to each other and lack this critical asset, they must focus on effective collaboration enabled by 'project control capability' to build social capital. In contrast, if the project is in an individualistic culture with high contract enforceability, the key governance mechanism that should be carefully implemented is collaboration. In this context, effective collaboration not only contributes significantly to project (time&cost) performance, but also enables the contractual provisions to be successfully implemented. Thus, collaboration is the primary contributor to relationship satisfaction by providing opportunities for knowledge accessing/acquisition, resource sharing, joint problem solving, and joint decision making.

Finally, the results may have implications for clients or constructors that are seeking to select partners to conduct a large project. In this regard, the findings provide valuable insights into the design of partner selection mechanisms in different contexts. For example, in countries with a collectivistic culture and low legal enforceability, since social capital is critical for success, it can receive more priority and be regarded as a critical factor among other criteria for partner selection. In other words, the partners that share a longer history are on priority, ceteris paribus, whereas in individualistic cultures with high legal enforceability, communication capabilities and contract drafting skills are the most important factors, respectively.

7.5 Limitations and future research

There are limitations in this study which suggest opportunities for additional research on the choice and effects of governance mechanisms. First, small sample size (specifically in Australian data set) is the major limitation of this thesis and makes it difficult to generalize the findings of the research. Additionally, caution needs to be exercised when generalizing the findings from this study across different types of projects or industries or cultures. These findings were based on a relatively small sample in the construction industry in Iran and Australia. Further studies are needed to validate the findings in similar contexts. Additionally, the cross-sectional nature of the research data limits the extent to which the causing effects in the model can be examined. Furthermore, although I did not find any evidence of a response bias, the validity of inferences should be considered in light of modest response rate and sample size. Future research can examine the validity of these findings by conducting longitudinal research or using larger samples to provide stronger claims of causality.

A further limitation of this study is treating governance mechanisms as static concepts that have a constant value throughout the project life cycle, rather than dynamic concepts that evolve during the period of collaboration. Past research has suggested that social capital evolves over ongoing social interactions among partners, and terms of contract also change. It is also expected that the need for reliance on different governance mechanisms would change during the project life cycle (Zheng, Roehrich, & Lewis, 2008). Considering the evolution of social capital and changes in the need for collaboration and reliance on contractual provisions could be a useful extension of this research.

Additionally, since the project control capability construct and its indicators were primarily borrowed from organizational control literature, it may not precisely reflect the specific control capabilities that are required in construction projects. Thus, future research can develop a new scale for measuring control capabilities of project partners. Further, it would probably be more accurate to consider different control capabilities for different project partners (e.g., client, contractor, consultant engineers) based on their role and responsibilities in the project.

Furthermore, although the study reveals the contingent effect of individualistic/collectivistic culture and high/low contract enforceability on the choice and effects of governance mechanisms, it does not tell the whole story and alternative explanations are worth considering. For example, it is plausible that other national institutions such as political or economic structures or market conditions influence the efficacy of governance mechanisms. Additionally, although the focus of the study was limited to large construction projects to control for diversity of the businesses and project size was adopted as control variable, controlling for additional variables such as asset specificity, environmental uncertainty, and buyer switching difficulty would be helpful for exploring alternative explanations for the choice and effects of governance mechanisms.

Finally, although I studied the client-contractor relationships, the data was collected from contractors. Although there is evidence about consistency of perceptions across exchange partners (e.g., J. C. Anderson & Narus, 1990; Zaheer, McEvily, & Perrone, 1998), future research could extend this work by including a wider sample of participants from both sides of partnerships.

7.6 Conclusions

This research aimed to add to the long-lasting debate on the choice and effects of governance mechanisms in regulating exchange relationships in complex transactions. Since exchange relationships in large construction projects are very complex, project partners need to utilize various governance mechanisms to safeguard relationships against opportunistic behaviors and integrate inter-organizational resources to achieve organizational objectives. While the IORs literature suggests to partners to use governance mechanisms (e.g., contractual mechanisms, relational mechanisms) to regulate their relationships, the factors that affect the choice and effects of these governance mechanisms have not been fully understood. As such, this research was conducted to fill three gaps in IORs governance literature by investigating (1) the distinctive role of social capital (e.g., prior ties, shared norms, trust) as ex-ante relational governance and collaboration (e.g., information exchange, joint actions) as ex-post relational governance in explaining project performance; (2) the impact of 'project control capability' on the choice and effects of governance mechanisms; and (3) the contingent effect of culture and contract enforceability on the choice and effects of governance mechanisms.

The results showed that there is no substitutive relationship between formal contract and ex-ante and ex-post relational governance mechanisms, but they are complementary. It was also found that in collectivistic cultures with low contract enforceability: firstly, social capital is a key enabler of project (time&cost) performance and relationship satisfaction; and secondly, effective collaboration impacts indirectly on relationship satisfaction enabled by 'project control capability'. In contrast, in individualistic cultures with high conreact

enforceability: firstly, effective collaboration is the linchpin between social capital, formal contract, and project (time&cost) performance enabled by 'project control capability'; secondly, working with trusted partners motivates collaboration which in turn leads to relationship satisfaction; and thirdly, formal contract impacts indirectly on relationship satisfaction enabled by collaboration.

The findings of this thesis provide important implications for IORs governance and project management literature and pave the way for further research into the choice and effects of governance mechanisms in construction projects.

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APPENDIX A: ACHIEVEMENTS

Publications

- Seyed Yaser Banihashemi, Li Liu; "*Formal Contracts, Social Capital, or Social Exchange; Which One Works Better in Regulating Client-Contractor Relationships in Unstable Environments?*"; Full paper accepted and will be presented in ICCREM 2014 Conference, September 27-28, 2014, Kunming, China.
- Seyed Yaser Banihashemi, Li Liu; "*Differentiating the Role of Ex-ante and Ex-post Relational Governance Mechanisms in Regulating Client-Contractor Relationships*"; Proceedings of PICMET 14 Conference, July 27-31, 2014, Kanazawa, Japan.
- Seyed Yaser Banihashemi, Li Liu; "*A Socio-economic Framework for Adopting Governance Mechanisms in Large Construction Projects*"; Proceedings of ARCOM 29 Conference, September 2-4, 2013, Reading, UK
- Seyed Yaser Banihashemi, Li Liu; "*Formal Governance Mechanism and Its Application in Construction Projects*"; Journal of Construction Engineering and Project Management, Vol. 3, Issue 1, 2013.
- Seyed Yaser Banihashemi, Li Liu; "*Social Governance Mechanisms in Construction Projects*"; Proceedings of CIB World Congress, July 5-9, 2013, Brisbane, Australia.
- Seyed Yaser Banihashemi, Li Liu; "*Lean Governance; A Paradigm Shift in Inter-organizational Relationships (IORs) Governance*"; Proceedings of IGLC20 conference, July 2012, San Diego, USA.

Awards

- Having won the PICMET 14 Brad Hosler Outstanding Student Paper Award, associated with USD1000 financial reward, for the paper entitled: "*Differentiating the Role of Ex-ante and Ex-post Relational Governance Mechanisms in Regulating Client-Contractor Relationships*".
- Having won the 1st prize in "Research Conversazione 2012", associated with AUD300 financial reward, for presenting a poster entitled: "*Lean Governance: A Value-based Approach towards Inter-organizational Relationships (IORs)*"
- Having granted AUD1960 PRSS award in 2014 for presenting a research paper in PICMET 14 Conference in Kanazawa, Japan.
- Having granted AUD3012 PRSS award in 2013 for presenting a research paper in ARCOM 29 Conference in Reading, UK.
- Having granted AUD2850 PRSS award in 2012 for presenting a research paper in IGLC20 Conference in San Diego University, USA.

APPENDIX B: CONSTRUCTS USED IN PRIOR STUDIES TO MEASURE CONTRACTUAL AND RELATIONAL GOVERNANCE

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms

No.	Study	Constructs and indicators	Measurement source
1	Cannon et al. (2000)	**Legal bonds** (Cronbach's alpha = 0.85): 1- We have specific, well-detailed agreements with this vendor. 2- We have formal agreements that detail the obligations of both parties. 3- We have detailed contractual agreements with this supplier.	-
2	Jap and Ganesan (2000)	**Explicit contract** (Cronbach's alpha = 0.57): 1- Our relationship with X is governed primarily by written contracts. 2- The only way we seem to communicate effectively with X is when everything is spelled out in detail. 3- Over time we have developed ways of doing things with X that never need to be expressed formally. (R)	-
3	Poppo and Zenger (2002)	**Contractual complexity** (Cronbach's alpha = 0.65): 1- The formal contract is highly customized and required considerable legal work. 2- The length of the contract (in pages).	- (Macneil, 1978)
4	Luo (2002)	**Contract** **Term specificity** (Cronbach's alpha = 0.71): - The degree to which an IJV contract (i.e., original main body and appendices as well as renewal supplements, if any) specifies relevant terms and clauses concerning the following: 1- How to set up the joint venture; 2- How to operate and manage the joint venture; 3- How to cooperate and resolve conflict between partners; 4- How to terminate the joint venture. **Contingency adaptability** (Cronbach's alpha = 0.65): - The extent to which: 1- Term specification is adaptive for issues that are particularly vulnerable to an uncertain environment or resource availability; 2- The contract has specified major principles or guidelines for handling unanticipated contingencies as they arise; 3- The contract has provided alternative solutions for responding to various contingencies that are likely to arise.	-
5	Lui and Ngo (2004)	**Contractual safeguards**: 1- A Standard Form of Building Contract for Hong Kong (or the Hong Kong Government Building Contract); 2- The right to examine and audit all relevant records through a quantity surveyor; 3- The designation of certain information as confidential and subject to proprietary provisions of the contract; 4- A lawsuit clause; 5- A majority of the standard provisions of the Extension of Time Claim; 6- Loss and expense standard contractual claims.	(Parkhe, 1993)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
6	Wuyts and Geyskens (2005)	**Detailed contract drafting** (Cronbach's alpha = 0.86): 1- In dealing with this supplier, our contract precisely defines the role of each partner. 2- In dealing with this supplier, our contract precisely defines the responsibilities of each partner. 3- In dealing with this supplier, our contract precisely states how each party is to perform. 4- In dealing with this supplier, our contract precisely states what will happen in the case of events occurring that were not planned.	(Lusch & Brown, 1996)
7	Ferguson et al. (2005)	**Contractual governance** (Cronbach's alpha = 0.74): 1- Relationship governed by rules and regulations of contract; 2- We would find satisfactory solution to disagreement, whether it is based on the agreement or not; 3- Contract adapted to company's specific needs; 4- Contract changes as client's business changes.	-
8	Lee and Cavusgil (2006)	**Contractual-based governance**: - The extent to which formalized, legally binding agreement or a contract were used to govern the inter-firm partnership.	(Roath, Miller, & Cavusgil, 2002)
9	Yu et al. (2006)	**Formal governance**: - the degree to which the governance mechanisms are used with suppliers are: 1- the manufacturing firm needs to guarantee the purchasing quantity; 2- the manufacturing firm needs to guarantee the purchasing price; 3- the manufacturing firm needs to pay part of the investment in the molds; and 4- the manufacturing firm pays for the mold investment beforehand and the supplier will reimburse the investments to the manufacturing firm only once the purchase-quantity has reached a certain level	-
10	Carson et al. (2006)	**Governance regime**: - Fixed price contract; - Negotiable price contract	-

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
11	Mellewigt et al. (2007)	**Contractual complexity**: 1- Periodic written reports of all relevant transactions. 2- Prompt written notice of any departures from the agreement. 3- The right to examine and audit all relevant records through a firm of CPAs. 4- Designation of certain information as proprietary and subject to confidentiality provisions of the contract. 5- Non-use of proprietary information even after termination of agreement. 6- Termination of agreement. 7- Arbitration clauses. 8- Lawsuit provisions. 9- Detailed provisions about the subject and scope of the partnership. 10- Clauses of liability in case of breach of contract. 11- Penalties in case of default of payment and default in delivery.	(Parkhe, 1993; Reuer & Ariño, 2002)
12	Y. Chen and Bharadwaj (2009)	**Monitoring** (The levels of contractual monitoring): - the sum of the contract clauses specifying monitoring mechanisms; **Property rights protection** (The levels of property rights protection): - the number of property rights protections; **Dispute resolution** (The number of choices of dispute resolution mechanisms): - the number of dispute resolution methods; **Contingency** (The number of contingency mechanisms): - the total number of contract contingency and adjustment methods; **Contract extensiveness** (Overall measure of the use of different provisions): - the total number of clauses in the above four categories.	-
13	Şengün and Wasti (2009)	**Output control** (Cronbach's alpha = 0.70): 1- Significant effort was required to gather the information necessary to outline the working relationship with wholesaler X. 2- There were many unspecified terms which had to be worked out as the relationship with wholesaler X developed. 3- It takes significant effort to detect whether or not wholesaler X conforms to pre-specified conditions. 4- Accurately evaluating wholesaler X requires a lot of effort.	(Grover & Malhotra, 2003; Möllering, 2003)
14	Lui (2009)	**Formal contract**: 1- We do not have specific, well-detailed agreements with this vendor. (R) 2- We have formal agreements that detail the obligations of both parties. 3- Our relationship with this supplier is governed primarily by written contract. 4- We have a detailed contract.	(Cannon & Perreault, 1999)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
15	Zhang et al. (2009)	**Formal contract** (Cronbach's alpha = 0.78): 1- There are prescribed, detailed rules in the contract in order to constrain each partner's behavior. 2- Each partner has already considered the contingencies that might emerge in the future at its best and has made an exhaustive explanation in the contract. 3- Cooperation will not be set up unless all details about cooperation have passed the regulations in the contract. 4- There are explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners. 5- There are well-specified responsibilities and rights for each partner.	(Dyer & Singh, 1998; Jap & Ganesan, 2000)
16	Hoetker and Mellewigt (2009)	**Formal governance**: 1- Business plans; 2- Balance sheets; 3- Performance indices; 4- Profit and loss accounts; 5- Internal prices; 6- Economic efficiency calculations; 7- Reports; 8- Service level agreements.	(Tarun K Das & Teng, 1998; Makhija & Ganesh, 1997; Martinez & Jarillo, 1989; Sitkin & Weingart, 1995)
17	D. Chen et al. (2009)	**Formal control** **Output control** (Cronbach's alpha > 0.70): 1- Overall goal setting; 2- Venture performance evaluation; 3- Executive rewards and recognition. **Process control** (Cronbach's alpha > 0.70): 1- Functional control; 2- Rules and regulations; 3- Organizational structure; 4- Job description; 5- Reporting systems.	-
18	Y. Liu et al. (2009)	**Contract** (Cronbach's alpha = 0.77): 1- Our relationship with this supplier (buyer) is governed primarily by written contracts. 2- We have formal agreements that detail the obligations and rights of both parties. 3- Over time we have developed ways of doing things with this supplier (buyer) that never need to be expressed contractually or formally (Reverse coded).	(Cannon et al., 2000; Jap & Ganesan, 2000)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
19	Zhou and Poppo (2010)	**Explicit contracts**: In dealing with this supplier, our contracts precisely defines 1- the role of each party. 2- the responsibilities of each party. 3- how each party is to perform. 4- what will happen in the case of event occurring unplanned. 5- how disagreements will be resolved.	(Lusch & Brown, 1996)
20	J. J. Li et al. (2010)	**Formal contract** (Cronbach's alpha = 0.89): 1- We have specific, well-detailed agreements with this supplier. 2- We have customized agreements that detail the obligations of both parties. 3- We have detailed contractual agreements specifically designed with this supplier.	(Cannon & Perreault, 1999)
21	Y. Li et al. (2010)	**Formal control** (Cronbach's alpha > 0.75): 1- The contract precisely defines the role/responsibilities of the partner and our firm. 2- The contract precisely states how each party is to perform in cooperation. 3- Generally, the contract is a primary mechanism to regulate the behavior of the partner in cooperation.	(Fryxell et al., 2002; Jap & Ganesan, 2000)
22	Zhao and Wang (2011)	**Formal contract** (Cronbach's alpha = 0.725): 1- Our relationship with this channel member is governed primarily by written contracts; 2- We have formal agreements that detail the obligations and rights of both parties; 3- Over time we have developed ways of doing things with this member that never need to be expressed contractually or formally (R).	(Y. Liu et al., 2009)
23	Yang et al. (2011)	**Formal control**: 1- We design specific, well-designed agreements with this supplier 2- We have formal agreements that specify in detail the obligations of both parties. 3- We have detailed a contractual agreement particular to this supplier.	(Cannon & Perreault, 1999)
24	L. Wang et al. (2011)	**Contract** (Cronbach's alpha = 0.76): 1- A detailed contract is the most important way to guarantee cooperation success. 2- In general, contract is the most important way to manage supplier's behavior. 3- Both parties would like to have details of cooperation fully listed in contract.	(Jap & Ganesan, 2000)
25	Arranz and Arroyabe (2012)	**Formal contract** (Cronbach's alpha = 0.70 for exploration projects and 0.73 for exploitation projects) 1- Our relationship with partners is governed primarily by written contracts. 2- We have formal agreements that specify the obligations and rights of both parties. 3- Over time we have developed ways of doing things with these partners that never need to be expressed contractually or formally (R).	(Cannon et al., 2000; Jap & Ganesan, 2000; Poppo & Zenger, 2002)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
26	Wallenburg and Schäffler (2014)	**Output control** (Cronbach's alpha = 0.85): 1- The alliance partners have established clear goals for this alliance. 2- Our alliance partners monitor the extent to which our company attains its agreed upon performance goals. 3- If our performance goals were not met, we would have to explain ourselves to the alliance partners. 4- We receive feedback from our alliance partners based on the extent to which we achieve our goals. 5- The distribution of alliance gains among the alliance members is based upon the accomplishment of predefined goals (eliminated). **Process control** (Cronbach's alpha = 0.85): 1- Our alliance partners monitor the extent to which we follow established procedures. 2- Our alliance partners evaluate the procedures we use to accomplish our alliance goals. 3- Our alliance partners give advice on improving our procedures when established goals are not achieved. 4- Our alliance partners give us feedback based on the extent to which we accomplish our performance goals (eliminated).	(Jaworski & MacInnis, 1989)
27	Rhee et al. (2014)	**Formal control** (Cronbach's alpha = 0.87) **Transactional provision** (Cronbach's alpha = 0.83): 1- Concerning the two companies' responsibilities and roles in the transaction, our contract is quite explicit/specific. 2- Concerning the criteria and process for monitoring products or service quality, our contract is quite explicit/specific. 3- Concerning the compensation/incentive method, our contract is quite explicit/specific. 4- Concerning the enforceability of the contract, such as the legal liability for a contract breach, our contract is quite explicit/specific **Relational provision** (Cronbach's alpha = 0.78): 1- Concerning the duties and rights of the two companies resulting from future uncertainty, our contract is quite explicit/specific. 2- Concerning the method/process of contract modification (renegotiation), our contract is quite explicit/specific.	-

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
28	L. Chen and Manley (2014)	**Formal mechanisms** **Risk and reward sharing regime**: 1- Any profit due to cost underruns that was allocated to the key service providers was shared fairly between the key service providers 2- Any share of loss due to cost overruns that was allocated to the key service providers was shared fairly between the key service providers 3- The client and key service providers shared equal proportions of profit due to cost underruns. 4- The client and key service providers shared equal proportions of loss due to project overruns. 5- Each key service provider's overall downside risk was capped at the loss of its fee. 6- A single agreement was developed to acknowledge that the parties would collectively share project risk. 7- There were incentive mechanisms to meet project goals. **Collective cost estimation**: 1- The client selected only one service provider to participate in the pricing stage. 2- The client and the key service providers collectively estimated the expected project cost. **Risk sharing of service providers**: 1- The key service providers paid a penalty if completion dates were not met. 2- The key service providers solely carried the risk of rising costs.	-
29	Ping et al. (2014)	**Contractual governance** **Fundamental elements** (Cronbach's alpha = 0.88): 1- Our relationship with the other parties is governed primarily by written contracts. 2- The contract has detailed the obligations and rights of every party. 3- The contract has a clear statement of the time, place and the way of project fulfillment. 4- The contract has described the safety management requirements, quality standards, contract price and its payment to manage the agreements among parties. **Change elements** (Cronbach's alpha = 0.75): 1- The contract has specified major principles or guidelines for handling unanticipated contingencies as they arise. 2- The contract has provided alternative solutions for responding to various contingencies that are likely to arise. 3- The contract has allowed us to respond quickly to match evolving client requirements. **Governance elements** (Cronbach's alpha = 0.88): 1- We have a clear expression of the default definitions and formula. 2- The contract has a detailed description of conditions under which termination may occur. 3- The contract has specified the procedures and methods for disputes.	(Goo, Kishore, Rao, & Nam, 2009; Luo, 2002) (Goo et al., 2009; Luo, 2002) (Goo et al., 2009)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-1 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring contractual mechanisms (Cont.)

No.	Study	Constructs and indicators	Measurement source
30	Abdi and Aulakh (2014)	**Contractual governance** (Cronbach's alpha = 0.74): 1- Most aspects of our relationship with this foreign partner are guided by formal written rules; 2- Most aspects of our agreement with this foreign partner are clearly specified in the contract; 3- If our foreign partner firm fails to achieve the specified targets specified in the contract, we penalize it.	(Mayer, 2006)

Appendix B: Constructs Used in Prior Studies to Measure Governance Mechanisms

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms

No.	Study	Constructs and indicators	Measurement source
1	Cannon et al. (2000)	**Cooperative norms** (Cronbach's alpha = 0.81): 1- We must work together to be successful. 2- Both sides are concerned about the other's profitability. 3- Both sides are willing to make cooperative changes. 4- One party will not take advantage of a strong bargaining position. 5- We do not mind owing each other favors. 6- No matter who is at fault, problems are joint responsibilities.	New scale
2	Jap and Ganesan (2000)	**Relational norms** **Information exchange** (Cronbach's alpha = 0.71): 1- In this relationship, it is expected that any information that might help the other party will be provided to them. 2- Information is informally exchanged in this relationship. 3- It is expected that we keep each other informed about events or changes that may affect the other party. 4- Exchange of information in this relationship takes place frequently. 5- It is expected that the parties will provide proprietary information if it can help the other party. **Solidarity** (Cronbach's alpha = 0.79): 1- Problems that arise in the course of this relationship are treated by my firm and X as joint rather than individual responsibilities. 2- Both firms are committed to improvements that may benefit the relationship as a whole and not only the individual parties. 3- The firms do not mind owing each other favors **Participation** (Cronbach's alpha = 0.73): 1- X plays an active role in the decisions we make regarding the retailing of its products. 2- We consult X concerning inventory decisions. 3- Our ideas for selling and servicing are welcomed by X. 4- X regularly asks our opinions and suggestions for improving its products and services.	(Dwyer & Oh, 1988; Heide & John, 1992)
3	Poppo and Zenger (2002)	**Relational governance** (Cronbach's alpha = 0.78): 1- The buyer has an extremely collaborative relationship with the vendor. 2- Both parties share long- and short-term goals and plans. 3- The buyer can rely on the vendor to keep promises.	(J. C. Anderson & Narus, 1990; Joskow, 1988; Macneil, 1978)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
4	Luo (2002)	**Cooperation** (Cronbach's alpha = 0.69): - The degree of interparty cooperation in the following nine areas: 1- Cooperation in deciding strategic objectives and goals for the IJV; 2- Being ready to give in on an issue to enable the IJV to achieve its goals, as stated in the contract; 3- Reaching a consensus in making strategic decisions; 4- Cooperation in distribution and execution of authority; 5- Cooperation in establishing managerial rules and policies for IJV activities; 6- Mutual consultation concerning strategic issues under uncertain conditions; 7- Cooperation in functional domains such as production, research and development, purchasing, marketing, human resources, and budgeting; 8- Cooperation in selecting the senior management of the IJV; 9- Cooperation in implementing new plans for the production mix, R&D, or new market entry.	-
5	Lui and Ngo (2004)	**Trust** **Goodwill trust** (Cronbach's alpha = 0.86): 1- Whether the contact person of the contractor had been fair in negotiations, 2- Whether the contact person was trustworthy, 3- Whether the contact person could be counted on to act as expected, and 4- Whether the architect had faith in the contact person. **Competence trust** (Cronbach's alpha = 0.81): 1- To what extent the contractor had been chosen for the project because of a good reputation and rich resources of capital and labor?	(Zaheer et al., 1998) (Reuer & Ariño, 2002)
6	Wuyts and Geyskens (2005)	**Close partner selection** (Cronbach's alpha = 0.94): 1- Before our firm selected this supplier for this purchasing agreement, 2- Our firm worked very intensively with this supplier. 3- Our firm had a very close relationship with this supplier. 4- Our firm's relationship with this supplier was like an arm's length delivery of the components. 5- Our firm and this supplier had a very collaborative relationship, like a real team.	(Marsden & Campbell, 1984; Mathews, White, Long, Soper, & BERGEN, 1998)

Table B-2: Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
7	Ferguson et al. (2005)	**Relational governance** (Cronbach's alpha = 0.83): 1- Disagreements with bank are solved as they occur. 2- Bank will work with company to prevent problems. 3- Bank committed to help in company's success. 4- Bank helps company improve its performance. 5- Business with bank based on mutual benefit and trust. 6- When faced with adversity, company can rely on bank. 7- Bank will expend effort to keep unsatisfied company. 8- Bank adapts to company's needs. 9- Bank will negotiate adjustments in service fees. 10- Bank provides timely and accurate information. 11- Bank informs us of new products or modifications.	(Brown, Dev, & Lee, 2000; Cannon et al., 2000; Paulin, Perrien, & Ferguson, 1997)
8	Lee and Cavusgil (2006)	**Relational-based governance:** - The extent to which the following relational tools were used in governance process: 1- mutual trust; 2- commitment; 3- relational capital.	(Roath et al., 2002)
9	Yu et al. (2006)	**Trust** **Calculative trust:** 1- The manufacturing firms will continue to do business with the supplier. 2- The manufacturing firm has a big buyer to support his business. 3- The manufacturing firm can introduce other customers to the supplier. **Benevolent trust (the length of a relationship):** The length of a relationship is measured by the number of years that the supplier and the manufacturing firm have been working with one another. **Benevolent trust (assistance-giving routines):** 1- The extent to which the manufacturing firm provides assistance in solving the supplierTs technical problems. 2- The extent to which the manufacturing firm provides assistance in helping the supplier reduce manufacturing costs. 3- The extent to which the manufacturing firm provides assistance to help the supplier improve inventory management	(Dyer & Chu, 2000; Holm, Eriksson, & Johanson, 1996) - (Dyer & Chu, 2000)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
10	Carson et al. (2006)	**Reputation:** 1- It was easy to learn about how contractors behaved in their previous relationships with other firms. 2- If the contractor was less than cooperative in our relationship, it would greatly damage its reputation with other firms. 3- In our industry, it is widely known which contractors are the best in terms of performance and collaboration. 4- Contractors in our industry watch their reputations closely.	-
		Continuity: 1- The parties expect to work together on future projects. 2- The parties were expected to focus on long-term goals in the relationship. 3- Our involvement with this contractor is open ended. 4- We expect this contractor to grow into a lifelong partner.	(Heide & Miner, 1992)
		Trust: 1- The parties held mutual expectations about the con tractor's responsibilities that went beyond what was specified in our formal agreements. 2- The parties expected that conflicts would be re solved fairly, even if no guidelines were given by our formal agreements. 3- There were performance goals for the contractor's work that were understood and accepted by the parties even though not written in our formal agreements. 4- When an unexpected situation arose, the parties had a mutual understanding that a win-win solution would be found, even if it contradicted our formal agreements. 5- Both parties were expected to share helpful information to an extent beyond that required by our formal agreements. 6- The parties held mutual expectations that each would be flexible and responsive to requests by the other, even if not obliged by our formal agreements. 7- Both parties understood that problems arising during the relationship would be solved jointly through communication and cooperation rather than 'just reference to our formal agreements. 8- Both parties understood that each would adjust to changing circumstances, even if not bound to change by formal agreements.	(Noordewier, John, & Nevin, 1990; Zaheer et al., 1998)
		History of relationships: - The total number of projects on which the client had employed the supplier in the past, not including the present project.	-

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
11	Mellewigt et al. (2007)	**Trust** (Cronbach's alpha = 0.80): 1- We worked together with the outside vendor in the past very often. 2- We will work together with the outside vendor in the future.	-
12	Y. Chen and Bharadwaj (2009)	**Prior interaction:** - The parties were involved in any business interaction including: (a) equity interest relationship: subsidiary/spin-off; (b) common board membership; (c) other lines of business.	-
13	Şengün and Wasti (2009)	**Trust** (Cronbach's alpha = 0.85): 1- Wholesaler X tries to help our pharmacy achieve its goals. 2- Wholesaler X tells both the advantages and disadvantages of its services. 3- Wholesaler X has always been evenhanded in its negotiations with us. 4- Wholesaler X is consistent in its applications. 5- Wholesaler X is an excellent source of accurate information. 6- Wholesaler X is very reliable. 7- The employees of Wholesaler X really know their business.	(Doucette, 1993; Zaheer et al., 1998)
		Social control (Cronbach's alpha = 0.68): 1- Wholesaler X has a good reputation in the industry. 2- Legal disputes with wholesaler X are unlikely. 3- Disagreements with wholesaler X are solved by working together. 4- We both cooperate to solve disagreements.	(Doucette, 1993)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
14	Lui (2009)	**Competence trust:** - How much do the following factors affect your choice of this supplier? 1- Reputation of being capable. 2- Production skill and expertise.	(Lui & Ngo, 2004)
		Time horizon **History of relationships:** a) Exploration phase: We are learning about each other, seeing if we can get along and meet each other's needs, meet our obligations to the other, and whether we might be able to work together more in the future. b) Buildup phase: Both of us are getting increasing benefits from our relationship. We have begun to build up trust and understanding between us, and we are satisfied so far, and see potential for a long term relationship. c) Maturity phase: Both of us see the relationship as ongoing and satisfactory, and both are receiving what we want and need by working together. d) Decline phase: One or both of us are becoming less satisfied with the relationship and may decide to end the relationship and/or search for alternative partners. e) Deterioration phase: We have begun to negotiate terms for ending our relationship or are in the process of dissolving the relationship.	(Jap & Ganesan, 2000)
		Expected future: Does your company plan to increase business with this supplier in the foreseeable future? a) Yes; b) No; c) Undecided.	-
15	Zhang et al. (2009)	**Informal contract** (Cronbach's alpha = 0.78): 1- Partners will communicate with each other about events and changes that will affect collaboration effects. 2- Each partner has devoted itself to mutually beneficial improvements, not only to its personal benefit. 3- The advice proposed by my organization in cooperation is always supported by the other partner.	(Tsai & Ghoshal, 1998; Uzzi, 1997)
		Shared values (Cronbach's alpha = 0.86): 1- Before this project, my partner had frequent contact with us. 2- It has always been pleasant during the cooperative history between us. 3- My partner is familiar with my prior cooperative experience.	(Morgan & Hunt, 1994; Young-Ybarra & Wiersema, 1999)
		Prior ties (Cronbach's alpha = 0.73): 1- My partner and I both have reached a consensus on industrial development. 2- My partner and I both have common intentions pertaining to this cooperation. 3- Even though there exists some inconsistency about short-term goals between us, it will not cause a big conflict. 4. My partner and I are both prepared to find common ground in the cooperation.	(E. Anderson & Weitz, 1989; Gulati, 1995)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
16	Hoetker and Mellewigt (2009)	**Relational governance:** 1- Steering committees; 2- Project groups; 3- Expert committees; 4- Cooperation managers; 5- Face-to-face meetings at the top management level; 6- Filling of key positions.	(Kale, Singh, & Perlmutter, 2000; Makhija & Ganesh, 1997; Martinez & Jarillo, 1989)
17	D. Chen et al. (2009)	**Social control** (Cronbach's alpha > 0.70): 1- Training and seminars 2- Collaborative task forces 3- Socialization with IJV managers	-
18	Y. Liu et al. (2009)	**Relational mechanisms** **Relational norms** (Cronbach's alpha = 0.77): 1- In this relationship, both parties expect that any information that may help the other party will be provided to that party. 2- In this relationship, ideas or initiatives of both sides are widely shared and welcomed via open communication. 3- In this relationship, problems or conflicts are expected by both parties to be solved through joint consultations and discussions. 4- In this relationship, both parties play a healthy role in the other party's decisions via mutual understanding and socialization. **Trust** (Cronbach's alpha = 0.79): 1- We believe in the supplier (buyer) because it is sincere. 2- Though the circumstances change, we believe that the supplier (buyer) will be ready and willing to offer us assistance and support. 3- When making important decisions, the supplier (buyer) is concerned about our welfare or interests. 4- We can count that the supplier (buyer)'s future decisions and actions will not adversely affect us. 5- When it comes to things that are important to us, we can depend on the supplier's (buyer's) support.	(Jap & Ganesan, 2000) (Kumar et al., 1995)
19	Zhou and Poppo (2010)	**Relational reliability:** 1- This supplier is trustworthy. 2- This supplier has always been evenhanded in its negotiation with us. 3- This supplier never uses opportunities that arise to profit at our expense. 4- We are not hesitant to transact with this supplier when the specifications are vague.	(Zaheer et al., 1998)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
20	J. J. Li et al. (2010)	**Relational mechanisms**	
		Brokered access (Cronbach's alpha = 0.73):	(Yli-Renko, Sapienza, & Hay, 2001)
		1- We have gotten new supplier contacts through this supplier.	
		2- This supplier has 'opened the doors' to other suppliers for us.	
		Shared goals (Cronbach's alpha = 0.76):	(Tsai & Ghoshal, 1998)
		1- Both parties in this relationship are enthusiastic about pursuing the collective goals.	
		2- Both parties are committed to improvements that may benefit the relationship as a whole, and not only the individual parties.	
		3- The parties share the same ambition and vision.	
		4- In most aspects of the relationship the parties are jointly responsible for getting things done.	
		Trust (Cronbach's alpha = 0.86):	(Zaheer et al., 1998)
		1- This supplier is trustworthy.	
		2- This supplier has always been evenhanded in its negotiations with us.	
		3- This supplier never uses opportunities that arise to profit at our expense.	
		4- We are not hesitant to transact with this supplier when the specifications are vague.	
21	Y. Li et al. (2010)	**Social control** (Cronbach's alpha > 0.75):	(Fryxell et al., 2002; Jap & Ganesan, 2000)
		Please indicate whether control was currently exercised through:	
		1- Reliance on the partner to keep promises;	
		2- Participatory decision-making;	
		3- Joint problem solving;	
		4- Fine-grained information exchange.	
		Length of cooperation:	-
		- The buyer-supplier relation has been in place for: (years)	
		Institutionalization (Cronbach's alpha > 0.75):	(Boddy, Macbeth, & Wagner, 2000; Ingram & Inman, 1996)
		1- Whether a comprehensive set of norms of action has been well developed in the cooperation.	
		2- Whether a binding set of rules for both firms has been created.	
		3- Whether both firms have a mutual understanding of each other's organizational culture, values, and operations.	
		4- Whether both firms share a common vision and ambition for the cooperative venture.	

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
22	Zhao and Wang (2011)	**Relational trust** (Cronbach's alpha = 0.701): 1- This channel member keeps promises made to our firm. 2- When it comes to things that are important to us, we can depend on the member's support. 3- When making important decisions, the member is concerned about our welfare or interests. 4- This channel member is trustworthy.	(Y. Liu et al., 2009)
		Relational learning (Cronbach's alpha = 0.881): 1- We exchange information on successful and unsuccessful experiences with products exchanged in the relationship. 2- We exchange information related to changes in end-user needs, preferences, and behavior. 3- We exchange information as soon as possible of any unexpected problems. 4- We exchange information on changes related to our two organizations' strategies and policies. 5- We exchange information that is sensitive for both parties, such as financial performance and company know-how.	(Selnes & Sallis, 2003)
23	Yang et al. (2011)	**Trust** (Cronbach's alpha = 0.840): 1- The parties feel comfortable to let the other party make decisions. 2- The parties can effectively do things for each other. 3- The parties are confident that the interests will be ensured because both are thought to belong to "one family".	(Lewicki & Bunker, 1995; Lewicki, McAllister, & Bies, 1998; Maguire, Phillips, & Hardy, 2001)
		Social ties: 1- Our firm has a close relationship with this supplier. 2- We feel that this supplier and our firm are in the same boat. 3- Our firm and this supplier site visit each other frequently 4- Our firm and the supplier frequently organize social activities. 5- The relationship between our firm and this supplier is reciprocal. 6- Our firm has a good relationship with this supplier.	(Rowley, Behrens, & Krackhardt, 2000; Uzzi, 1999; Wegener, 1991)
24	L. Wang et al. (2011)	**Trust** (Cronbach's alpha = 0.92): 1- Our partners are dependable. 2- Our partners always keep their word. 3- We are confident of the capability of our partners. 4- Without monitoring, our partners will try to fulfill his obligations.	(Jap & Ganesan, 2000; Zaheer et al., 1998)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
25	Arranz and Arroyabe (2012)	**Transactional mechanisms** (Cronbach's alpha = 0.81 for exploration projects and 0.79 for exploitation projects) **Relational norms:** 1- We expected open communication and sharing of information, ideas or initiatives from other partners. 2- Partners had extremely collaborative relationships. 3- Partners shared long- and short-term goals and plans. 4- Problems and conflicts were solved through joint consultations and discussions. **Trust:** 1- We believed in the honesty of actions from other partners. 2- In decision-making, partners were concerned about interests of other partners.	(Jap & Ganesan, 2000; Kumar et al., 1995; Y. Liu et al., 2009; Poppo & Zenger, 2002)
26	Wallenburg and Schäffler (2014)	**Joint action in ex ante performance measurement process** (Cronbach's alpha = 0.93): 1- We involve all key alliance partners in defining performance measures. 2- All of our key alliance partners have a major influence on selecting performance measures. 3- All key alliance partners are intensely involved in setting targets for decision-relevant metrics. 4- All our key alliance partners have a strong influence on setting (performance) targets for decision-relevant (performance) metrics.	(I. J. Chen & Paulraj, 2004; Forslund & Jonsson, 2009)
		Joint action in ex post performance measurement process (Cronbach's alpha = 0.93): 1- We involve all key alliance partners in measuring the operational performance of the alliance. 2- All of our key alliance partners have a major part in the operational performance measurement of the alliance performance. 3- We involve all key alliance partners in analyzing the alliance performance results. 4- All of our key alliance partners have a major part in analyzing the alliance performance results.	(I. J. Chen & Paulraj, 2004; Forslund & Jonsson, 2009)
27	Rhee et al. (2014)	**Social control** (Cronbach's alpha = 0.85) 1- We rely on each other to keep promises. 2- We share information on plans and schedules frequently. 3- We keep our major supplier informed about events or changes that may affect them. 4- We share the problems that arise and attempt to resolve them together. 5- When an unexpected situation arises, we prefer to work out a new deal as opposed to holding each other to the original agreement.	(Fryxell et al., 2002; Jap & Ganesan, 2000; Y. Li et al., 2010)
		Prior ties - The number of years that the two firms have been engaged.	(Joshi & Campbell, 2003; Reuer & Ariño, 2007)

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
28	L. Chen and Manley (2014)	**Informal mechanisms** **Leadership:** 1- The project leaders had strong communication skills. 2- The project leaders had strong logistical skill. 3- The project leaders made decisions on a best-for-project basis. 4- The project leaders encouraged cooperation between parties. 5- The project leaders sought consensus across the supply chain in decision making. 6- The project leaders effectively engaged with community stakeholders. **Team workshops:** 1- Where appropriate, workshops involved all levels of seniority. 2- Where appropriate, workshops involved a broad range of participant types. 3- Workshops were used for post-review assessment. 4- Workshops were used for innovation development. 5- Workshops were used for integration of key service providers. 6- Workshops were run by an independent facilitator. **Relationship manager:** 1- There was a relationship manager to maintain cooperation over the life of the project. 2- There was a relationship manager to build cooperation in the early stages of the project. **Communication systems:** 1- An integrated web-based IT system was established, including building information modeling (BIM). 2-Communication tools (such as an expectation matrix) were developed to allow participant organizations to align their commitments to each other. **Design integration:** 1- Construction subcontractors were involved in design. 2- Suppliers were involved in design. 3- The main contractor was involved in design	-

Table B-2 : Constructs, indicators, and measurement sources used in selected empirical studies for measuring relational mechanisms (Cont.)

No.	Study	Factors and indicators	Measurement source
29	Ping et al. (2014)	**Relational governance**	
		Trust (Cronbach's alpha = 0.882):	(Chow, Cheung, & Chan, 2012; Pinto, Slevin, & English, 2009)
		1- We believe the other party can keep their word throughout the life of the project.	
		2- We feel confident that the other parties have high levels of integrity and honest.	
		3- We believe the project engineers and other technical people are competent at what they are doing.	
		4- We trust that the project participants are able to fulfill contractual agreements.	
		5- We are certain that the other parties have the ability to perform their tasks.	
		6- We believe that the other parties could meet the requirements of the project in technology and management.	
		Relational norms	(Griffith & Myers, 2005)
		Information exchange (Cronbach's alpha = 0.822):	
		1- Exchange of information among the parties takes place frequently.	
		2- We keep each other informed about events or changes that may affect the other parties.	
		3- The parties established a good contact with each other, avoiding the possible misunderstandings.	
		Solidarity (Cronbach's alpha = 0.825):	
		1- The parties are consistent with the expectations of this project.	
		2- The project overall plan and the implementation scheme are shared by every party.	
		3- Parties involved in this project regard each other as major partners.	
		Flexibility (Cronbach's alpha = 0.731)	
		1- We believed that the parties were willing to cooperate to work out solutions if some unexpected situations arise.	
		2- The parties expected to be able to make adjustments in the ongoing relationship to cope with changing circumstances.	
30	Abdi and Aulakh (2014)	**Relational governance** (Cronbach's alpha = 0.77):	(Aulakh, Kotabe, & Sahay, 1996; Heide & John, 1992)
		1- Our business relationship with this partner is characterized by high levels of trust.	
		2- In this partnership, our firm and our foreign partner expect to be able to make adjustments in the ongoing relationship to cope with changing circumstances.	
		3- Over the years, our relationship with this partner is more and more guided by informal rules and procedures.	
		4- Our firm and the foreign partner are very committed to each other.	

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APPENDIX C: RESEARCH QUESTIONNAIRE

Participation Information Statement

Dear Sir/Madam

You are kindly invited to participate in a study of "Governance Mechanisms in Large Construction Projects".

What is the study about?

The main objective of this research is to validate a framework predicting the effects of various project governance mechanisms such as formal contracts, relational contracting, etc on the performance of the large construction project.

Who is carrying out the study?

The study is being conducted by Seyed Banihashemi and will form the basis for the degree of Doctor of Philosophy at The University of Sydney under the supervision of Dr. Li Liu, Senior Lecturer.

What does the study involve?

The questionnaire asks questions about governance mechanisms and project context in relation to the respondents most recently completed project.

How much time will the questionnaire take?

It will take around 20 minutes to complete this questionnaire.

Can I withdraw from the study?

Being in this study is completely voluntary. You are not under any obligation to consent and if you do consent you can withdraw at any time without affecting your relationship with The University of Sydney. Also you can withdraw if you submitted your survey by informing Seyed Banihashemi by e-mail within three months. If you want to find more about the study, please do not hesitate to contact Seyed Banihashemi.

Will anyone else know the results?

All aspects of the study, including results, will be strictly confidential and only the researchers will have access to information on participants, unless otherwise required by law. Therefore, the likely outcome from this study is publications in academic conferences, journals and/or books but individual participants will not be identifiable in such a report.

Will the study benefit me?

The validated framework from the study will help construction companies to better understand how various governance mechanisms impact on project performance and assist in the design of effective project governance system. The research is expected to conclude by mid 2014, and consequently participants in the study will receive a summary of findings.

Can I tell other people about the study?

Please feel free to inform your fellow project managers about the study and they are welcome to participate.

What if I require further information about the study or my involvement in it?

If you would like to know more at any stage, please feel free to contact Seyed Banihashemi, PhD Candidate, School of Civil Engineering, Faculty of Engineering and Information Technology, The University of Sydney.
Email: seyed.banihashemi@sydney.edu.au.
Mob: +61 4 5097 9794
Fax: +61 2 9351 3343

What if I have a complaint or any concerns?

Any person with concerns or complaints about the conduct of a research study can contact The Manager, Human Ethics Administration, The University of Sydney.
Email: ro.humanethics@sydney.edu.au
Tel: +61 (2) 8627-8176
Fax: +61 (2) 8627-8177

Questionnaire Guideline

Below are some guidelines for completing the questionnaire:

1. This study defines a 'Large Construction Project' as a project with a total contract value of more than AUD5 M (in the case of a sub-contractor, total sub-contract value of more than $5 M), hereinafter referred to as 'project'.
2. Please respond in relation to one of your most recently completed projects (completed during last 3 years or has had at least 80% progress till now).
3. The word 'organisation' refers to the parent organisation for which you have been working during the project.
4. The word 'partner' refers to:
   a. The 'client', if your organisation has been in a contractual relationship with them as the 'contractor' or as a 'sub-contractor' of the project.
   b. The 'general contractor', if your organisation has been in a contractual relationship with them as a 'sub-contractor' of the project.
   c. The 'sub-contractor', if your organisation has been in a contractual relationship with them as the 'general contractor' of the project.
5. The word 'project organisation' refers to a temporary organisation composed of representative project team members from different parent organisations whose articles of association are the contract.
6. You have to be one of the senior managers in the project or in one of the parent organisations (e.g. contractor, sub-contractor). You should have enough information about the history of collaboration between the organisation and the partner as well as the details of formal and informal contracts in this project.

Participant Consent Form

*** I agree to give consent to my participation in the research project entitled: "Governance Mechanisms in Large Construction Projects".**

☐ Accept

*** In giving my consent I acknowledge that:**

1. The procedures required for the project and the time involved have been explained to me, and any questions I have about the project have been answered to my satisfaction.
2. I have read the Participant Information Statement and have been given the opportunity to discuss the information and my involvement in the project with the researcher/s.
3. I understand that being in this study is completely voluntary – I am not under any obligation to consent.
4. I understand that my involvement is strictly confidential. I understand that any research data gathered from the results of the study may be published however no information about me will be used in any way that is identifiable.
5. I understand that I can withdraw from the study at any time, without affecting my relationship with the researcher(s) or the University of Sydney now or in the future.

*** I consent to receive feedback:**

☐ Yes ☐ No

*** Please provide your details below:**

Name: _____

Email: _____

Company: _____

Signature ..... Date .....

Part 1: Project-specific Characteristics

1. Within which of the following fields would you classify the project?

☐ **Building** (e.g. educational, commercial, residential, administrative, public, recreational, hospital, industrial plant)

☐ **Water** (e.g. dam, sewage plant, pipeline, water tank)

☐ **Transportation** (e.g. airport, port, bridge, road, tunnel)

☐ **Power** (e.g. power plant, distribution network)

☐ **Oil & Gas** (e.g. off-shore platform, drilling, pipeline, refinery, petrochemical plant)

☐ **Other** (please specify) _____

2. What was the size of the project in terms of total planned budget? (specified in your organisation's contract with your partner)

	5-10	10-50	50-100	100-500	500-1000	More than 1000
Total planned budget (Millon AUD)	☐	☐	☐	☐	☐	☐

3. What was the size of the project in terms of total planned duration? (specified in your organisation's contract with your partner)

	Less than 12	12-18	18-24	24-36	36-48	More than 48
Total planned duration (Months)	☐	☐	☐	☐	☐	☐

4. To what extent do you agree with the following statements, comparing this project to other construction projects in Australia in the same field?

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7	N/A
PC1. It was possible to check the project team's progress towards project goals through formal reviews and reports.	☐	☐	☐	☐	☐	☐	☐	☐
PC2. It was possible to monitor how well the project team was meeting project goals.	☐	☐	☐	☐	☐	☐	☐	☐
PC3. It was possible for us to determine whether the project team built a product (or deliverable) that satisfied the users' requirements.	☐	☐	☐	☐	☐	☐	☐	☐
PC4. There were quantifiable measures of the extent to which project cost targets were achieved.	☐	☐	☐	☐	☐	☐	☐	☐
PC5. It was possible for us to determine whether the project team completed the project work on time.	☐	☐	☐	☐	☐	☐	☐	☐
PC6. There was a well understood way to carry out project tasks.	☐	☐	☐	☐	☐	☐	☐	☐
PC7. The project team had substantive experience with this type of project.	☐	☐	☐	☐	☐	☐	☐	☐

Part 2: Ex-ante Governance Mechanisms

5. To what extent do you agree with the following statements about the relationships between your organisation and your partner, before the start of this project?

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7	N/A
PT1. Before this project, we had extensive collaboration with this partner on other projects.	☐	☐	☐	☐	☐	☐	☐	☐
PT2. It has always been pleasant during our collaboration.	☐	☐	☐	☐	☐	☐	☐	☐
SN1. Both organisations had a mutual understanding of each other's organisational culture, values, and operations.	☐	☐	☐	☐	☐	☐	☐	☐
SN2. Both organisations had a common vision and ambition for the cooperative venture.	☐	☐	☐	☐	☐	☐	☐	☐
SN3. A comprehensive set of norms of action was well developed in the cooperation.	☐	☐	☐	☐	☐	☐	☐	☐
TR1. During our previous collaborations, this partner has been evenhanded in its negotiations with us.	☐	☐	☐	☐	☐	☐	☐	☐
TR2. During our previous collaborations, this partner has been an excellent source of accurate information.	☐	☐	☐	☐	☐	☐	☐	☐
TR3. During our previous collaborations, this partner has been reliable.	☐	☐	☐	☐	☐	☐	☐	☐

Part 3: Ex-post Governance Mechanisms

6. To what extent do you agree with the following statements about the relationship between your organisation and your partner, during the project?

	Strongly disagree 1	2	3	4	5	6	Strongly agree 7	N/A
CL1. The two sides exchanged information on changes related to organisations' strategies and policies.	☐	☐	☐	☐	☐	☐	☐	☐
CL2. The two sides exchanged information on successful and unsuccessful experiences.	☐	☐	☐	☐	☐	☐	☐	☐
CL3. The two sides have been communicating with each other via frequent interaction and informal socialization.	☐	☐	☐	☐	☐	☐	☐	☐
CL4. The two sides agreed to effectively do things for each other.	☐	☐	☐	☐	☐	☐	☐	☐
CL5. The two sides agreed to work together to resolve the problems caused by whichever party.	☐	☐	☐	☐	☐	☐	☐	☐
CL6. The two sides have been communicating with each other about events and changes that would affect collaboration.	☐	☐	☐	☐	☐	☐	☐	☐
FC1. Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	☐	☐	☐	☐	☐	☐	☐	☐
FC2. In our contract with our partner we defined project targets in detail.	☐	☐	☐	☐	☐	☐	☐	☐
FC3. There were well-specified responsibilities and rights for each partner.	☐	☐	☐	☐	☐	☐	☐	☐
FC4. There were explicitly prescribed institutions and measures to resolve the disputes and conflicts between partners.	☐	☐	☐	☐	☐	☐	☐	☐
FC5. Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	☐	☐	☐	☐	☐	☐	☐	☐

Part 4: Performance

7. To what extent do you agree with the following statements about the relationship performance on this project between your organisation and your partner?

	Strongly Disagree 1	2	3	4	5	6	Strongly Agree 7
RS1. This cooperation contributed to our core competencies and competitive advantage.	☐	☐	☐	☐	☐	☐	☐
RS2. This cooperation realised the objectives we set out to achieve.	☐	☐	☐	☐	☐	☐	☐
RS3. This cooperation improved our relationship and increased the likelihood of working together in the future.	☐	☐	☐	☐	☐	☐	☐
RS4. Overall, we were satisfied with the performance of this cooperation.	☐	☐	☐	☐	☐	☐	☐

8. How do you rate the project performance on fulfilling each of the following objectives comparing to similar projects in the field?

	Very poor 1	2	3	4	5	6	Excellent 7
PP1. Time performance	☐	☐	☐	☐	☐	☐	☐
PP2. Cost performance	☐	☐	☐	☐	☐	☐	☐

9. In answering the following questions, if project schedule was adjusted during the course of the project by agreement with the partner, please use those adjusted targets. Otherwise, please use the initial project schedule.

	Behind Schedule (+100%)	Behind Schedule (50%-100%)	Behind Schedule (25%-50%)	Behind Schedule (0-25%)	On Schedule	Ahead of Schedule (0-25%)	Ahead of Schedule (25%-50%)	Ahead of Schedule (50%-100%)	Ahead of Schedule (+100%)
Project time performance	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. In answering the following questions, if project budget was adjusted during the course of the project by agreement with the partner, please use those adjusted budget. Otherwise, please use the initial project budget.

	Above the Budget (+100%)	Above the Budget (50%-100%)	Above the Budget (25%-50%)	Above the Budget (0-25%)	On Budget	Below the Budget (0-25%)	Below the Budget (25%-50%)	Below the Budget (50%-100%)	Below the Budget (+100%)
Project cost performance	☐	☐	☐	☐	☐	☐	☐	☐	☐

Part 5: Background information

11. Age of organisation (in years):

☐ Less than 5 ☐ 5-10 ☐ 10-15 ☐ 15-20 ☐ More than 20

12. What was your designation/job title in the project/parent organisation at the time you were working at the project?

13. How many years have you practised in the construction industry?

☐ Less than 5 ☐ 5-10 ☐ 10-20 ☐ 20-30 ☐ More than 30

14. What is your age?

☐ 25-30 ☐ 30-40 ☐ 40-50 ☐ 50-60 ☐ 60 or older

15. What is the highest level of education you have completed?

☐ High school ☐ Diploma ☐ Bachelor ☐ Masters Degree/Honors ☐ PhD

*** Comments:**

اطلاعات مورد نیاز مشارکت کنندگان

بسمه تعالی

با سلام؛

احتراما، از شما دعوت می شود در این پژوهش با نام "مکانیزمهای کنترلی در پروژه های بزرگ احداث" مشارکت نمایید.

موضوع پژوهش چیست؟

هدف اصلی این پژوهش طراحی و اعتبارسنجی مدلی برای پیش بینی تأثیر انواع مکانیزمهای کنترلی همچون قراردادهای رسمی و تعاملات غیررسمی، بر عملکرد پروژه های بزرگ احداث می باشد.

چه کسی این پژوهش را انجام می دهد؟

این مطالعه، مبنای رسالهٔ دکتری سید یاسر بنی هاشمی می باشد که در دانشگاه سیدنی و با راهنمایی دکتر لیو انجام می گیرد.

پرسشنامه چه مواردی را شامل می شود؟

این پرسشنامه شامل سؤالاتی در مورد مشخصات پروژه و مکانیزمهای کنترلی استفاده شده در پروژه می باشد که فرد پاسخ دهنده باید با در نظر گرفتن یکی از پروژه هایی که اخیرا انجام داده است به این سؤالات پاسخ گوید.

پاسخگویی به پرسشنامه چقدر زمان لازم دارد؟

پاسخگویی به این پرسشنامه در حدود 20 دقیقه زمان لازم خواهد داشت.

آیا می توان از شرکت در پژوهش انصراف داد؟

شرکت در این پژوهش کاملا اختیاری بوده و شما هیچگونه اجباری برای این کار نخواهید داشت. حتی در صورت موافقت اولیه جهت مشارکت در پژوهش، شما قادر خواهید بود بدون هیچگونه پیامدی، در هر زمانی که لازم بدانید از مشارکت در این پژوهش انصراف دهید. همچنین شما می توانید تا سه ماه پس از پر کردن و ارسال پرسشنامه، با ارسال ایمیل به سید یاسر بنی هاشمی انصراف خود را اعلام نمایید.

آیا پاسخهای جمع آوری شده در اختیار دیگران قرار داده خواهد شد؟

تمامی اطلاعات جمع آوری شده در این پژوهش، از جمله نتایج آن، بصورت کاملا محرمانه خواهد بود و تنها تیم پژوهش به این اطلاعات دسترسی خواهند داشت. بنابراین در صورتیکه نتایج مطالعات در کنفرانسهای علمی، مجلات پژوهشی و یا کتابها ارائه گردند، کلیهٔ اطلاعات شخصی مشارکت کنندگان در این پژوهش مخفی خواهد ماند.

آیا شرکت در این پژوهش فایده ای برای مشارکت کننده خواهد داشت؟

شرکتها و افراد فعال در صنعت احداث می توانند با استفاده از مدلی که در نهایت بعنوان خروجی این تحقیق ارائه خواهد شد درک بهتری از چگونگی تأثیر مکانیزمهای کنترلی مختلف بر عملکرد پروژه ها داشته باشند و این امر می تواند آنها را در طراحی یک سیستم کنترلی مؤثر و کارآ برای پروژه های آتی یاری نماید. پیش بینی می شود این پژوهش تا نیمهٔ سال 1393 شمسی خاتمه یابد که در پایان خلاصه ای از نتایج آن در اختیار مشارکت کنندگان عزیز قرار خواهد گرفت.

آیا می توان دیگران را از این پژوهش مطلع ساخت؟

شما می توانید در مورد این پژوهش با دوستان و همکاران خود گفتگو کنید و در صورت تمایل، آنها را به شرکت در این تحقیق دعوت نمایید.

در صورت نیاز به اطلاعات بیشتر در مورد این پژوهش و یا چگونگی پاسخ به سؤالات چه باید کرد؟

خواهشمند است در هر مرحله از همکاری، جهت دریافت اطلاعات تکمیلی، با سید یاسر بنی هاشمی، دانشجوی دکتری مدیریت ساخت دانشکدهٔ عمران دانشگاه سیدنی تماس حاصل نمایید. آدرس ایمیل: seyed.banihashemi@sydney.edu.au

شماره تلفن همراه (استرالیا): 9794 5097 4 61+ ؛ شماره دورنگار (استرالیا): 3343 9351 2 61+

در صورت بروز نگرانی و یا شکایت در مورد این تحقیق چه باید کرد؟

در صورت بروز هرگونه نگرانی و یا شکایت در مورد انجام این پژوهش، می توانید با مدیر ادارهٔ حقوق فردی دانشگاه سیدنی تماس حاصل فرمایید.

آدرس ایمیل: ro.humanethics@sydney.edu.au ؛ شماره تلفن (استرالیا): 8176 8627 2 61+ ؛ شماره دورنگار (استرالیا): 8177 8627 2 61+

راهنمای پاسخگویی به سؤالات

پاسخگوی گرامی؛

خواهشمند است بندهای زیر را که حاوی نکات مهمی دربارهٔ برخی مفاهیم استفاده شده در پرسشنامه می باشد، با دقت مطالعه فرمایید:

1. در این پژوهش، "**پروژهٔ بزرگ احداث**" به پروژه ای گفته می شود که مبلغ کلی قرارداد آن **بیش از 5 میلیارد تومان** باشد (در مورد پیمانکار جزء، مبلغ قرارداد پیمانکار جزء باید بیش از 5 میلیارد تومان باشد). از این پس بجای "پروژه بزرگ احداث" از لفظ "**پروژه**" استفاده خواهیم کرد.
2. جهت پاسخگویی به سؤالات این پرسشنامه، لطفا **یک پروژه** را که اخیرا انجام داده اید (در طول 3 سال گذشته تمام شده باشد و یا در حال حاضر بیش از 80٪ پیشرفت فیزیکی داشته باشد) انتخاب نمایید.
3. لفظ "**سازمان**" در این پرسشنامه به معنای سازمانی است که در طول پروژه، شما در استخدام آن بوده اید.
4. لفظ "**همکار**" در این پرسشنامه به سازمانی اطلاق می شود که به یکی از روشهای زیر در پروژه با سازمان شما همکاری داشته است:
   - **کارفرما؛** در صورتیکه سازمان شما بعنوان پیمانکار اصلی و یا یکی از پیمانکاران جزء پروژه با آن قرارداد داشته است.
   - **پیمانکار اصلی؛** در صورتیکه سازمان شما بعنوان پیمانکار جزء با آن قرارداد داشته است.
   - **پیمانکار جزء؛** در صورتیکه سازمان شما بعنوان پیمانکار اصلی پروژه با آن قرارداد داشته است.
5. لفظ "**سازمان پروژه**" در این پرسشنامه به سازمان موقتی اطلاق می شود که از مجموع نمایندگان سازمانهای مشارکت کننده در پروژه (تیم پروژه) که حلقهٔ اتصال آنها قراردادهای پروژه است، تشکیل یافته است.
6. جایگاه شما باید در نقش یکی از مدیران ارشد پروژه و یا یکی از مدیران ارشد شرکت پیمانکاری، و یا پیمانکار جزء پروژه باشد، بطوری که از سابقهٔ همکاری سازمان خود با سازمان همکار و نیز جزئیات قرارداد آنها در پروژهٔ مذکور اطلاع کافی داشته باشید.

فرم رضایت مشارکت کنندگان

*** اینجانب بدینوسیله رضایت خود را برای مشارکت در پروژهٔ پژوهشی با نام "مکانیزمهای کنترلی در پروژه های بزرگ احداث" اعلام می نمایم.**

☐ قبول

*** ضمن اعلام رضایت خود، موارد زیر را تصدیق می نمایم:**

1. روش همکاری در این پژوهش و زمان مورد نیاز برای من شرح داده شده و به تمامی سؤالات من در این باره پاسخ مناسب داده شده است.
2. صفحهٔ "اطلاعات مورد نیاز مشارکت کنندگان" را خوانده ام و به من این فرصت داده شده است تا دربارهٔ اطلاعات مورد نیاز در خصوص نحوهٔ همکاری در این پژوهش با تیم پژوهشی گفتگو نمایم.
3. اینجانب آگاهی کامل دارم که مشارکت من در این پژوهش کاملا اختیاری است و اذعان دارم که تحت هیچگونه فشاری برای پذیرش این همکاری قرار ندارم.
4. اینجانب آگاهی کامل دارم که مشارکت من در این پژوهش کاملا محرمانه است. همچنین اطلاع دارم که کلیهٔ اطلاعات جمع آوری شده از نتایج این تحقیق امکان انتشار دارد، گرچه هیچگونه اطلاعاتی در مورد اینجانب بصورتی که قابل شناسایی باشد مورد استفاده قرار نخواهد گرفت.
5. اینجانب آگاهی کامل دارم که در هر زمانی بدون اینکه رابطه ام با تیم پژوهشی و یا دانشگاه سیدنی، در زمان حال و یا در آینده، تحت تأثیر قرار بگیرد، قادر به فسخ همکاری می باشم.

*** مایل هستم گزارش نهایی این پژوهش را دریافت نمایم:**

☐ بلی ☐ خیر

*** لطفا در صورتیکه جواب شما به سؤال "دریافت گزارش نهایی پژوهش" مثبت بوده است، مشخصات خود را اعلام فرمایید:**

نام و نام خانوادگی	
آدرس ایمیل	
نام شرکت	

امضاء: ..... تاریخ: .....

بخش اول: خصوصیات پروژه

1. این پروژه در کدامیک از شاخه های زیر قرار می گیرد؟

☐ **ابنیه و ساختمان** (آموزشی، تجاری، مسکونی، اداری، عمومی، تفریحی، بیمارستان، کارخانهٔ صنعتی، ...)

☐ **آب** (سدسازی، تصفیه خانه، مخازن آب، خطوط انتقال آب و فاضلاب، ...)

☐ **راه و ترابری** (فرودگاه، بندر، پلسازی، راهسازی، تونل سازی، ...)

☐ **نیرو** (نیروگاه، خطوط انتقال و توزیع، ...)

☐ **نفت و گاز** (تأسیسات دریایی، حفاری، خطوط انتقال نفت و گاز، پالایشگاه، واحد پتروشیمی، ...)

☐ **سایر موارد** (لطفا تعیین کنید) ____

2. لطفا اندازهٔ پروژه را از لحاظ مبلغ قرارداد، با توجه به قرارداد فیمابین سازمان شما و سازمان همکار مشخص نمایید:

	5-10	10-50	50-100	100-500	500-1000	بیشتر از 1000
مبلغ اولیه قرارداد به میلیارد تومان	☐	☐	☐	☐	☐	☐

3. لطفا اندازهٔ پروژه را از لحاظ مدت قرارداد، با توجه به قرارداد فیمابین سازمان شما و سازمان همکار مشخص نمایید:

	کمتر از 12	12-18	18-24	24-36	36-48	بیشتر از 48
مدت اولیه قرارداد به ماه	☐	☐	☐	☐	☐	☐

4. در مقایسهٔ پروژهٔ مورد نظر با سایر پروژه های کشور در همین رشته، تا چه اندازه با عبارتهای زیر دربارهٔ این پروژه موافقید؟

	کاملا مخالفم	←		بیطرف	→		کاملا موافقم	کاربردی ندارد
PC1: امکان نظارت بر پیشرفت تیم پروژه از طریق بررسیها و گزارشهای رسمی وجود داشت.	☐	☐	☐	☐	☐	☐	☐	☐
PC2: امکان نظارت بر تیم پروژه و سنجش نحوهٔ حرکت آنها به سمت اهداف پروژه وجود داشت.	☐	☐	☐	☐	☐	☐	☐	☐
PC3: امکان سنجش اینکه آیا کیفیت محصولات خروجی پروژه با خواسته های مشتری مطابقت داشته است، وجود داشت.	☐	☐	☐	☐	☐	☐	☐	☐
PC4: بخاطر تعریف سنجه های مالی قابل اندازه گیری، امکان سنجش اینکه آیا اهداف هزینه ای پروژه تحقق یافته است، وجود داشت.	☐	☐	☐	☐	☐	☐	☐	☐
PC5: امکان سنجش اینکه آیا تیم پروژه کار پروژه را به موقع تمام کرده است، وجود داشت.	☐	☐	☐	☐	☐	☐	☐	☐
PC6: روش انجام فعالیتهای پروژه کاملا شناخته شده بود.	☐	☐	☐	☐	☐	☐	☐	☐
PC7: تیم پروژه دانش کافی برای انجام فعالیتهای پروژه را دارا بود.	☐	☐	☐	☐	☐	☐	☐	☐

بخش دوم: مکانیزمهای کنترلی پیش زمینه

5. در مورد سوابق همکاری سازمان خود و سازمان همکار، پیش از آغاز این پروژه، به چه میزان با عبارتهای زیر موافق هستید؟

	کاملا مخالفم	←	←	بیطرف	→	→	کاملا موافقم	کاربردی ندارد
PT1: پیش از آغاز این پروژه، همکاریهای وسیعی در قالب پروژه های دیگر بین سازمان ما و سازمان همکار وجود داشته است.	☐	☐	☐	☐	☐	☐	☐	☐
PT2: در طول مدت همکاری، همواره این همکاریها مطلوب و دلپذیر بوده است.	☐	☐	☐	☐	☐	☐	☐	☐
SN1: در اثر همکاریهای گذشته، هر دو سازمان درک مشترکی نسبت به فرهنگ سازمانی و ارزشها و روالهای کاری یکدیگر بدست آورده اند.	☐	☐	☐	☐	☐	☐	☐	☐
SN2: تحت تأثیر همکاریهای گذشته، هر دو سازمان به چشم انداز مشترکی نسبت به همکاریهای متقابل دست یافته اند.	☐	☐	☐	☐	☐	☐	☐	☐
SN3: در اثر همکاریهای گذشته بین سازمان ما و سازمان همکار، نُرمهای رفتاری مشترک به میزان قابل توجهی گسترش یافته اند.	☐	☐	☐	☐	☐	☐	☐	☐
TR1: در طول همکاریهای گذشته، سازمان همکار همواره منبع بسیار خوبی برای دریافت اطلاعات دقیق بوده است.	☐	☐	☐	☐	☐	☐	☐	☐
TR2: در طول همکاریهای گذشته، سازمان همکار همواره در مذاکرات با ما عادلانه رفتار کرده است.	☐	☐	☐	☐	☐	☐	☐	☐
TR3: در طول همکاریهای گذشته، سازمان همکار همواره قابل اتکا بوده است.	☐	☐	☐	☐	☐	☐	☐	☐

بخش سوم: مکانیزمهای کنترلی پروژه

6. تا چه میزان با عبارتهای زیر در توصیف رابطهٔ میان سازمان خود و سازمان همکار در طول پروژه موافق هستید؟

	کاملا مخالفم	←	←	بیطرف	→	→	کاملا موافقم	کاربردی ندارد
CL1: هر دو طرف در مورد تغییرات در استراتژیها و خط مشی های سازمانی خود با هم تبادل اطلاعات می کردند.	☐	☐	☐	☐	☐	☐	☐	☐
CL2: هر دو طرف تجربیات موفق و ناموفق خود را در اختیار یکدیگر قرار می دادند.	☐	☐	☐	☐	☐	☐	☐	☐
CL3: هر دو طرف از طریق مراودهٔ مستمر و برقراری تعاملات اجتماعی غیررسمی، با یکدیگر در ارتباط بودند.	☐	☐	☐	☐	☐	☐	☐	☐
CL4: هر دو طرف توانستند بطور مؤثر و شایسته ای برای یکدیگر کارهایی انجام دهند و به هم کمک نمایند.	☐	☐	☐	☐	☐	☐	☐	☐
CL5: طرفین سعی می کردند مشکلات بوجود آمده را فارغ از اینکه مسبب آن چه کسی بوده است با تعامل با هم حل نمایند.	☐	☐	☐	☐	☐	☐	☐	☐
CL6: هر دو طرف در مورد اتفاقات و تغییراتی که ممکن بود همکاری آنها را تحت تأثیر قرار دهد با یکدیگر تعامل می کردند.	☐	☐	☐	☐	☐	☐	☐	☐
	☐	☐	☐	☐	☐	☐	☐	☐
CG1: قرارداد، مکانیزم اصلی حاکم بر تعامل و همکاری طرفین بود.	☐	☐	☐	☐	☐	☐	☐	☐
CG2: اهداف پروژه بطور دقیق در قرارداد فیمابین تعریف شده بود.	☐	☐	☐	☐	☐	☐	☐	☐
CG3: مسئولیتها، اختیارات و حقوق طرفین قرارداد بطور کاملا دقیق و مشخص در قرارداد ذکر شده بود.	☐	☐	☐	☐	☐	☐	☐	☐
CG4: مکانیزمها و سنجه های مشخص و شفافی جهت حل اختلافات احتمالی میان طرفین قرارداد پیش بینی شده بود.	☐	☐	☐	☐	☐	☐	☐	☐
CG5: هر یک از طرفین قرارداد تمام تلاش خود را کرده بود تا تمامی مواردی را که ممکن بود در آینده رخ دهد با جزئیات کافی در قرارداد بگنجاند.	☐	☐	☐	☐	☐	☐	☐	☐

بخش چهارم: عملکرد

7. همکاری سازمان خود با سازمان همکار در این پروژه را در موارد زیر چگونه ارزیابی می کنید؟

	کاملا مخالفم			بیطرف			کاملا موافقم
RS1: این همکاری باعث ارتقاء مهارتهای کلیدی و مزیت رقابتی در سازمان ما شد.	☐	☐	☐	☐	☐	☐	☐
RS2: این همکاری به اهدافی که برایش در نظر گرفته بودیم رسید.	☐	☐	☐	☐	☐	☐	☐
RS3: این همکاری باعث بهبود روابط دو طرف و افزایش احتمال همکاریهای آتی گردید.	☐	☐	☐	☐	☐	☐	☐
RS4: بطور کلی، ما از این همکاری راضی بودیم.	☐	☐	☐	☐	☐	☐	☐

8. عملکرد پروژه را در مقایسه با پروژه های مشابه، در موارد زیر چگونه ارزیابی می کنید؟

	بسیار ضعیف			متوسط			بسیار عالی
PP1: عملکرد زمانی	☐	☐	☐	☐	☐	☐	☐
PP2: عملکرد هزینه ای	☐	☐	☐	☐	☐	☐	☐

9. در صورتیکه در طول پروژه برنامهٔ زمان بندی پروژه با هماهنگی با سازمان همکار تغییر کرده است، لطفا در پاسخگویی به سؤال زیر زمان بندی جدید پروژه را مبنا قرار دهید، در غیر اینصورت خواهشمند است براساس برنامهٔ اولیهٔ پروژه پاسخ دهید.

	دیرتر از موعد (بیش از 100 درصد)	دیرتر از موعد (100-50 درصد)	دیرتر از موعد (50-25 درصد)	دیرتر از موعد (25-0 درصد)	طبق برنامه	زودتر از موعد (25-0 درصد)	زودتر از موعد (50-25 درصد)	زودتر از موعد (100-50 درصد)	زودتر از موعد (بیش از 100 درصد)
عملکرد زمانی پروژه	☐	☐	☐	☐	☐	☐	☐	☐	☐

10. در صورتیکه در طول پروژه بودجهٔ پروژه با هماهنگی با سازمان همکار تغییر کرده است، لطفا در پاسخگویی به سؤال زیر بودجه بندی جدید پروژه را مبنا قرار دهید، در غیر اینصورت خواهشمند است براساس برنامهٔ اولیهٔ پروژه پاسخ دهید.

	بیشتر از بودجهٔ پیش بینی شده (بیش از 100 درصد)	بیشتر از بودجهٔ پیش بینی شده (100-50 درصد)	بیشتر از بودجهٔ پیش بینی شده (50-25 درصد)	بیشتر از بودجهٔ پیش بینی شده (25-0 درصد)	طبق برنامه	کمتر از بودجهٔ پیش بینی شده (25-0 درصد)	کمتر از بودجهٔ پیش بینی شده (50-25 درصد)	کمتر از بودجهٔ پیش بینی شده (100-50 درصد)	کمتر از بودجهٔ پیش بینی شده (بیش از 100 درصد)
هزینهٔ واقعی پروژه	☐	☐	☐	☐	☐	☐	☐	☐	☐

بخش پنجم: اطلاعات شخصی

11. عمر سازمان به سال

☐ کمتر از 5 سال ☐ 5-10 ☐ 10-15 ☐ 15-20 ☐ بیش از 20 سال

12. سِمَت شما در پروژه و یا سازمان چه بود؟

13. چند سال در صنعت احداث مشغول به کار بوده اید؟

☐ کمتر از 5 سال ☐ 5-10 ☐ 10-20 ☐ 20-30 ☐ بیش از 30 سال

14. چند سال سن دارید؟

☐ 25-30 ☐ 30-40 ☐ 40-50 ☐ 50-60 ☐ 60 یا بیشتر

15. آخرین مدرک تحصیلی شما چه بوده است؟

☐ دیپلم ☐ فوق دیپلم ☐ لیسانس ☐ فوق لیسانس ☐ دکترا

*** نظرات و پیشنهادات:**