

Differentiating the Role of Ex-ante and Ex-post Relational Governance Mechanisms in Regulating Client-Contractor Relationships

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Abstract--Poor project governance is the main cause of project failures for complex projects. Historically, formal contracting has been the mainstay of project governance for outsourced projects. However, subsequent studies found that reliance on formal contracting typically results in adversarial relationship 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. Moreover, due to high levels of uncertainty and complexity in practice, it is often impossible or excessively expensive to construct “complete” contracts upfront or the institutional structures needed to enforce the contract do not exist. Consequently, relational governance mechanisms have been proposed as an effective alternative in such situations. Subsequent literature has shifted to the effects of contractual and relational governance mechanisms on the performance of exchange relationships as well as the interactions between those mechanisms. In particular, the relationship between contractual and relational governance has been the focus of a substantial body of literature and the findings are contradictory. Whilst some studies find the relationship to be substitutive, others indicate it is complementary.

In this study, drawing from transaction cost economics (TCE), social capital theory, and social exchange theory, we re-examine the relationship by distinguishing two forms of relational governance, namely ex-ante and ex-post relational governance and argue that the relationship between these two forms and contractual governance are substitutive and complementary, respectively, thereby reconciling the contradictory findings on the relationship.

Our conceptual model is validated using survey data collected from 40 client-contractor partnerships in large construction projects in Australia. Contributing to literature, the results show that ex-ante relational governance has both substitutive relationship as well as complementary relationship (mediated by ex-post relational governance) with formal contracting while ex-post relational governance has a complementary relationship with formal contracting. In addition, the results indicate that formal contracting has direct effect on project performance while ex-post relational governance has a direct effect on relationship performance.

I. INTRODUCTION

The relationship between clients and contractors in large construction projects is typically adversarial, which has been attributed as one of the main causes of project failure [31, 43]. 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 [53]. However, due to high levels of uncertainty and complexity in practice, it is often impossible or excessively

expensive to construct “complete” contracts upfront or the institutional structures needed to enforce the contract do not exist [36]. Consequently, relational governance mechanisms have been proposed as an effective alternative in such situations. Subsequent literature has shifted to the effects of contractual and relational governance mechanisms on the performance of exchange relationships as well as the interactions between those mechanisms. In particular, the relationship between contractual and relational governance has been the focus of a substantial body of literature and the findings are contradictory. Whilst some studies find the relationship to be substitutive [34, 63], others indicate it is complementary [39, 49].

In this study, we re-examine the relationship by distinguishing two forms of relational governance, namely ex-ante and ex-post relational governance mechanisms, and argue that the relationship between these two forms and contractual governance are substitutive and complementary, respectively, thereby reconcile the contradictory findings on the relationship. This study also extends transaction cost theory by incorporating social capital and social exchange as ex-ante and ex-post relational governance mechanisms respectively. Social capital is viewed as an important asset that is embedded within partners’ dyadic ties and is manifested as trust and shared norms among partners which provides credit and promotes confidence among partners in undertaking a complex venture and reduces the transaction costs throughout the project duration. On the other hand, social exchange (e.g. information exchange, “we-ness” feeling exchange, joint problem solving, joint decision making) that will occur intentionally during project life cycle, consolidates the benefits of social capital by reassuring the partners about their counterpart’s goodwill, avoiding self-interest-seeking behavior, and promoting cooperative atmosphere.

Field survey data subsequently validated our conceptual model. In the sections below, literature is reviewed and constructs are defined. Then research design is described and results are reported. Finally, implications are discussed and conclusions are drawn.

II. THEORY AND HYPOTHESES

A. Contractual governance mechanisms

We use the term contractual governance to refer to the extent to which binding contractual agreements are used to enforce the realization of specified promises or project deliverables by the contracting parties. Formal contract impacts on the relationships between contracting parties and

project outcomes in a number of ways. First, it reduces behavioral uncertainty and incongruence by providing formal rules and procedures and clarifying assumptions about the scope of the project, the project objectives, or the way for sharing gains/losses [7, 25, 59]. Secondly, by specifying the rights and responsibilities of both parties, contracts can improve coordination among partners and promote commitment [7, 25]. Thirdly, contracts can safeguard the relationship against opportunistic behavior by imposing legal and economic sanctions for violating the contracts [25, 34, 48]. Finally, contracts can reduce monitoring cost by adding to the transparency of relationship and determining the objects of monitoring [34, 50].

B. Relational governance mechanisms

Despite the positive aspects of formal contracting discussed above, reliance on formal contracting could lead to adversarial relationships between the contracting parties as both sides delve into the legalistic aspects [58]. Studies have found that adversarial relationships contribute significantly to project failures [31, 43]. Relational governance can be an alternative governance choice to formal contracting by providing more flexibility and mitigating unexpected disturbances throughout the project [63]. However, there exists ambiguity on the definition of relational governance. While some studies refer to the existing shared norms and/or trust between partners as relational governance mechanisms [29, 33, 34, 40, 49, 63, 66], others emphasize on the social exchanges and informal processes that take place throughout the current relationship [7, 8, 12, 23, 25, 30, 35, 57, 65]. Noticeably, a number of studies treat these as two different forms of relational governance [4, 32, 66].

Both Liu et al. [32] and Arranz et al. [4] define relational governance mechanisms comprising of relational norms and trust, and argue that these relational mechanisms complement the contracts in uncertain conditions. However, they do not discuss about the potential differences of these relational mechanisms in terms of their independent effect on each other and on contractual governance. Likewise, Zhao and Wang [66] introduce relational trust and relationship learning as two relational mechanisms and study the moderating effect of relational trust on both formal contracts and relationship learning. Although the concept of relationship learning they used is very close to our conceptualization of ex-post relational governance, the study still lacks to address the independent and joint effect of these two relational mechanisms on formal contracts.

Adapting from Zhao and Wang [66], we conceptualize two forms of relational governance: ex-ante and ex-post relational governance. Below, the two forms of relational governance are defined and their relationships with contracts and project outcomes are discussed.

1) Ex-ante relational governance

Recurring interactions among partners, in the form of project partnerships, can gradually create shared norms and

promote trustful atmosphere in a way that may function as governance mechanism [49]. Shared norms are defined generally in the literature as expectations about partner's behavior that are partially shared among parties [7, 16, 38] and could be manifested as shared values and shared goals. Trust, on the other hand, refers to the exchange's cooperative atmosphere and is defined as the confidence or belief that exchange partners hold about each other's goodwill and reliability in an uncertain situation [10, 51, 63]. The spirit of such sentiments may be captured by the concept of social capital. As discussed in the literature, social capital is a valuable asset obtained through social relationships by getting access to other resources [17]. According to the literature, social capital refers to the sum of the actual and potential resources embedded within, available through, and derived from social relationships, as well as the goodwill made available through such relationships [1, 42]. As mentioned by Adler and Kwon [1], "social capital resembles some kinds of capital and differs from others". This notion of social capital makes it particularly suitable for the purpose of this paper. From definition, capital is something valuable that is already available and is ready to be exploited. Social capital, like all other forms 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" [1]. Therefore, it is arguably different from the social relationships from which social capital is stemmed. That is, the social capital alone is of value, regardless of the fact whether the social interactions are still resuming or not. First, as mentioned earlier, social capital is providing access to some benefits which weren't available in the absence of social capital. Second, "social capital is convertible to other kinds of capital such as economic capital" [1]. In terms of governance cost, it means that the existing shared norms and trust among partners may reduce the transaction costs such as negotiation costs, contract writing, and monitoring costs [6, 7, 40]. Third, like other forms of capital, "social capital can either be a substitute for or can complement other resources" [1]. For example, Yang et al. [63] show that in strong tie relationships, formal contracts is better to be substitute with trust, because formal mechanisms may promote distrust in working environment. On the other hand, considering both control and coordination concerns in exchange relationships, Mellewigt et al. [40] suggest that under high-trust situation, trust is a complement of contractual complexity, because, formal contracts enable coordination in exchange relationship, whereas trustful atmosphere addresses the control concerns and mitigates the probability of any opportunistic behavior.

In sum, we argue that existing social capital among project partners which stems from past social relationships among partners and is manifested by shared norms and trust, can serve as relational governance mechanism.

2) *Ex-post relational governance*

As articulated by Adler & Kwon [1], social capital should be maintained through regular recreation and reconfirmation of social bonds, otherwise, it would lose its efficacy. We argue that the process of creation/recreation and reconfirmation of social bonds among partners is another form of relational governance that we call it ex-post relational governance. In other words, ex-post relational governance is not social capital by the time of application, but 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 [21, 25, 32, 38]. Based on social exchange theory and relational contracting theory, using ex-post relational governance can promote solidarity that shifts the partners' views from self-centered behavior towards "we-ness" feeling. Information exchange, on the other hand, reduces asymmetries through communication that leads to harmonization of conflict and honesty in the project. Finally, ex-post relational governance enables the partners to share common decisions and establish or revise the project objectives [32, 54]. All these advantages can help the partners to control the opportunism and promote coordination in project activities.

To summarize, we distinguish between ex-ante and ex-post relational governance, by referring to the former as social capital (e.g. shared norms and trust) that has been embedded into partners' relationships through previous collaborations, and defining the latter as social interactions in the current project (e.g. information exchange, solidarity, participation). In this study, we argue that these two forms of relational mechanisms can have different interactions with contractual mechanisms in explaining project and relationship performance. Fig. 1 represents our conceptual framework that shows our proposed relationships between three governance mechanisms and their impact on project and relationship

performance. In the next section, we explain the relevant hypothesis.

C. Interaction between governance mechanisms

1) *Ex-ante relational governance and contractual mechanisms*

Part of literature on IORs governance has viewed ex-ante relational governance and formal contracts as substitutes and has argued that the presence of one governance device (relational governance, in particular) eliminates the need for the other [11, 18, 27, 37]. For example, Dyer & Singh [11] argued that trust and reputation as informal mechanisms can replace formal contracts. Likewise, Uzzi [62] contended that social embeddedness within partners' relationships can reduce transaction costs by mitigating costly contracting negotiations. In the same way, Larson [27] emphasized on the role of relational governance mechanisms on lowering transaction costs and facilitating adaptive responses. On the other hand, some scholars claimed that the use of detailed contracts may undermine trustful relationship among partners and consequently affect cooperation.

Following the above argument, we hypothesize:

H1a: Ex-ante relational governance is negatively associated with contractual governance.

Despite the scholars that view ex-ante relational governance and contractual governance mechanisms as substitutes, there is another stream of studies emphasizing their complementarity. They argue that contracts in complex exchanges are always incomplete because of unpredictable events that may happen in the future. As a result, when unexpected situations arise, contracts are not able to provide reliable basis to guarantee continuance or a mutually acceptable, bilateral resolution [38]. Therefore, ex-ante relational governance may play a complementary role to the adaptive limits of formal contracts in such conditions. Additionally, embedded relationships among partners may help them to reflect their lessons learned from past collaborations in their new contract. Consequently, ex-ante

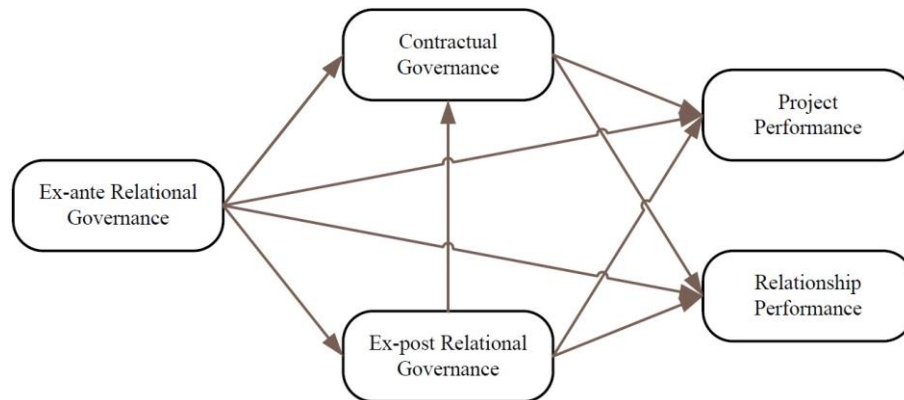


Fig. 1: Conceptual model

relational governance may gradually develop more complex and detailed contracts, as the partners become more knowledgeable about the deficiencies of previous contracts. Therefore, we hypothesize:

H1b: Ex-ante relational governance is positively associated with contractual governance.

2) Ex-ante relational governance and ex-post relational mechanisms

Some scholars hold that social capital can facilitate information exchange and knowledge transfer among partners [1, 24, 42]. Similarly, Morgan & Hunt [41] contend 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, we hypothesize:

H2: Ex-ante relational governance is positively associated with ex-post relational governance.

3) Ex-post relational governance and contractual governance

Applying mechanisms that reproduce and renew cooperative norms may provide the working environment in which contracts may be negotiated, written, administered, monitored, and effected in a lower cost and more efficiently [7]. In such an environment, while contracts may structure expectations and obligations and serve as an enforcement mechanism, ex-post relational mechanisms provide flexibility that is needed for uncertain conditions and cooperative works. Thus, we hypothesize:

H3: Ex-post relational governance is positively associated with contractual governance.

4. Ex-ante relational governance, ex-post relational governance and contractual governance

Having considered above, there are contradictory results about complementary or substitutive interactions between relational governance mechanisms and formal contracts. We posit that inconsistency in the results might be originated from inconsistency in the measures. Furthermore, the literature has not differentiated between ex-ante and ex-post relational governance mechanisms which we believe that they have different nature and accordingly may have various functions as governance mechanisms. In this sense, we argue that partners who have collaborated extensively in the past, have two options in terms of the application of ex-post relational governance for the current project. If they decide not to spend time and money to refresh and reconfirm the existing social capital that has been embedded in their relationships through joint activities and social interactions in the new project, it may deteriorate to some extent the advantages that could have been gained from previous collaborations. The immediate inference of this situation

might be the lack of confidence on both sides to keep promises in the new venture and the need for more formal provisions to make sure about the partner's behavior. But it doesn't mean that they will lose the entire benefits, because the existing knowledge about partner's interests and capabilities can support them to avoid adversarial relationship and complement the deficiencies of the contracts.

On the other hand, if they decide to use ex-post relational governance to reconstruct and nurture the existing social capital, very detailed contracts may become unnecessary because of their pernicious signals of distrust.

In sum, we argue that while ex-ante relational governance may have substitutive effect on contractual governance, the joint use of ex-ante and ex-post relational governance would play complementary role on the use of detailed contracts. Therefore, we postulate the following hypothesis:

H4: The relationship between ex-ante relational governance and contractual governance is mediated by ex-post relational governance.

III. RESEARCH DESIGN

In this section, research method is described, questionnaire design explained, data collection process outlined and data analysis process defined. In addition, the descriptive statistics for the sample and the instruments are reported.

A. Research design and data collection

There is a large body of literature on relationship governance with sophisticated definitions of key constructs and validated instruments for measuring the constructs. Therefore, we have decided to use questionnaire survey to collect field data to test the hypotheses developed above.

We have chosen Australian construction industry to collect data for the following reasons: (1) construction industry is the fourth largest contributor to Gross Domestic Product (GDP) in the Australian economy; (2) Australian construction industry has been one of the leading industries throughout the world in developing new forms of relational contracting and partnership [2].

The population surveyed are project managers and project personnel who have been involved in large construction projects.

Before conducting the main survey, a pilot study was done to improve content validity and reliability. Based on the feedback from seven practitioners and academic experts, minor modifications to the questionnaire were made. The questionnaire was then sent to 56 companies and their national subsidiaries. The list of contractors was obtained from two popular listings; namely Australian Constructors Association (ACA), Australian Industry Group. The questionnaire was accompanied by an introductory letter explaining research objectives and assuring confidentiality and access to the summary of our aggregated survey results. In total, 241 questionnaires were sent to the nominated

companies and their subsidiaries. 49 returned questionnaires of which 40 were complete and valid, giving a response rate of 17%. The response rate is reasonable comparing to the typical rate for mail surveys in construction industry [28, 44] and also for mailed surveys to top managers [20, 33]. The summary of respondents' background (table 1) shows that more than 75% of respondents are either senior managers of construction companies or project managers. Majority of respondents are very well experienced in construction industry— above 60 percent have more than 20 years working experience.

The respondents were requested to provide the data about a recently completed construction project (completed during last 3 years or has had at least 80% progress to date) with a total contract value of more than \$5 M. As shown in table 2, most of the nominated projects are from building,

transportation, and water sectors and the planned budget in 50% of the projects exceeds \$50 M.

B. Survey instrument

The instrument for key constructs is listed in table 3. Ex-ante relational governance is a second-order construct consisted of trust and shared norms. Shared norms was measured by three questions that was adopted from the work of Li et al. [30] reflecting previous collaborations between partners and the extent to which they shared goals and values. For measuring trust, we used three items obtained from Sengun and Wasti [57] showing the quality of past relationships and the extent to which those relationships convinced the firm to believe that its partner is honest and benevolent [26]. Ex-post relational governance refers to the mechanisms that are deploying in the current relationship to enrich relational ties and promote trustful environment

TABLE 1: A SUMMARY OF RESPONDENTS' BACKGROUND INFORMATION

Profile items		Number	Percentage
Designation of respondent	- Company top managers (e.g. managing director, general manager, state manager)	4	10
	- Company middle managers (e.g. business support manager, commercial manager)	4	10
	- Project top managers (e.g. project director, project manager, construction manager, site manager)	27	67.5
	- Project middle managers (e.g. project engineer, project risk manager, earthworks construction manager)	4	10
	- Not specified	1	2.5
Experience in construction industry (years)	< 5	2	5
	5-10	6	15
	10-20	7	17.5
	20-30	14	35
	> 30	11	27.5
Age (years)	25-30	3	7.5
	30-40	7	17.5
	40-50	15	37.5
	50-60	13	32.5
	> 60	2	5
Education	High school	1	2.5
	Diploma	5	12.5
	Bachelor	23	57.5
	Masters/ Honors	10	25
	PhD	1	2.5

TABLE 2: PROFILE OF THE NOMINATED PROJECTS

Characteristics		Number	Percentage
Field	Building	21	52.5
	Water	7	17.5
	Transportation	8	20
	Power	0	0
	Oil & Gas	2	5
	Others	2	5
Planned budget (Million AUD)	5-10	7	17.5
	10-50	13	32.5
	50-100	3	7.5
	100-500	11	27.5
	500-1000	4	10
	> 1000	2	5
Planned duration (Months)	< 12	4	10
	12-18	11	27.5
	18-24	13	32.5
	24-36	5	12.5
	36-48	3	7.5
	> 48	4	10

among partners. For operationalizing this construct, we adapted four items from Selnes and Sallis [56], Yang et al. [63], and Luo et al. [35]. Contractual governance refers to legal bonds which specify the responsibilities and rights of both parties and considers contingencies that might emerge in the future. Four items used to measure contractual governance were obtained from Li et al. [30] and Zhang et al. [65].

We differentiated between project performance and relationship performance with the former measured on time and cost performance while the latter measured using four items from Saxton [55]. The questions were rated on a seven-point Likert scale (1= Strongly disagree, 7= Strongly agree). For questions related to project performance the anchors were different: 1= Very poor to 7= Excellent. We included project size as control variable in our analysis. For measuring the project size we asked about planned budget and planned duration of the project.

C. Measurement model evaluation

As mentioned earlier, 40 complete and valid responses were received. Although the number of responses is relatively low, statistical analysis could still be performed based on the central limit theorem that holds true if the sample size is more than 30 [13, 47]. To validate the measures, we used confirmatory factor analysis (CFA) using SmartPLS software package [52]. Table 3 shows that Cronbach's alpha for each construct is over 0.7, indicating good internal consistency for all variables [46]. Following Bagozzi & Yi [5], composite reliability (CR) scores are calculated to assess convergent validity. The scores presented in table 3 show that all factors have CRs greater than 0.7. The table also shows that all the AVE (average variance extracted) values are satisfactorily greater than 0.5, indicating good convergent validity.

TABLE 3: CONSTRUCT RELIABILITY AND VALIDITY

	Factor loading	Cronbach Alpha	CR	AVE
Ex-ante relational governance (EA)		0.861	0.901	0.647
Trust		0.856	0.913	0.778
EA1: During our previous collaborations, this partner has been evenhanded in its negotiations with us.	0.836			
EA2: During our previous collaborations, this partner has been an excellent source of accurate information.	0.942			
EA3: During our previous collaborations, this partner has been reliable.	0.864			
Shared norms		0.755	0.890	0.802
EA4: Both organisations had a mutual understanding of each other's organisational culture, values, and operations.	0.876			
EA5: Both organisations had a common vision and ambition for the cooperative venture.	0.915			
Ex-post relational governance (EP)		0.783	0.860	0.608
EP1: The two sides exchanged information on changes related to organisations' strategies and policies.	0.666			
EP2: The two sides exchanged information on successful and unsuccessful experiences.	0.736			
EP3: The two sides agreed to effectively do things for each other.	0.860			
EP4: The two sides agreed to work together to resolve the problems caused by whichever party.	0.842			
Contractual governance (CG)		0.782	0.857	0.604
CG1: Generally, the contract was the primary mechanism to regulate the behavior of the partner in cooperation.	0.742			
CG2: In our contract with our partner we defined project targets in detail.	0.854			
CG3: There were well-specified responsibilities and rights for each partner.	0.620			
CG4: Each partner considered the contingencies that might emerge in the future at its best and made an exhaustive explanation in the contract.	0.867			
Project performance (PP)		0.821	0.918	0.848
PP1: Time performance	0.910			
PP2: Cost performance	0.931			
Relationship performance (RP)		0.950	0.965	0.872
RP1: This cooperation contributed to our core competencies and competitive advantage.	0.830			
RP2: This cooperation realized the objectives we set out to achieve.	0.981			
RP3: This cooperation improved our relationship and increased the likelihood of working together in the future.	0.959			
RP4: Overall, we were satisfied with the performance of this cooperation.	0.968			
Project size (PS)		0.798	0.904	0.825
PS1: What was the size of the project in terms of total planned budget? (specified in your organisation's contract with your partner)	0.893			
PS2: What was the size of the project in terms of total planned duration? (specified in your organisation's contract with your partner)	0.944			

TABLE 4: CORRELATION MATRIX AND SQUARE ROOT OF AVES FOR EACH FACTOR

Variable	RP	PP	CG	EP	EA	PS
RP	0.9338					
PP	0.4902	0.9209				
CG	0.2322	0.2984	0.7772			
EP	0.3532	0.1785	0.4683	0.7797		
EA	0.1298	0.1833	0.0367	0.5308	0.8044	
PS	0.0886	-0.2120	0.2440	0.0622	-0.1936	0.9083

Note 1: EA= Ex-ante relational governance, EP= Ex-post relational governance, CG= Contractual governance, PP= Project performance, RP= Relationship performance, PS= Project size.

Note 2: Bolded numbers are square root of AVEs

All the items loaded onto the expected factors without significant cross-loadings. For examining discriminant validity, we also applied the procedure recommended by Fornell & Larcker [14]. Accordingly, the squared correlation between each pair of constructs should be less than the AVE for each individual construct. As shown in table 4, the square root of AVEs for each construct is greater than all correlation values between each pair of constructs that represents strong discriminant validity.

D. Analysis

To consider the multiple interactions between ex-ante and ex-post relational governance mechanisms, and contractual governance mechanisms and their contribution to project and relationship performance, Partial Least Squares Structural Equation Modeling (PLS-SEM) was undertaken, using SmartPLS software package [52]. We selected PLS-SEM because of its ability to model latent constructs [9], deal with non-normal data set [22], and its minimum demand for sample size [9, 19]. Further, sobel test [60] was undertaken, using sobel test calculator [61], to examine the hypothesized mediation effects in the structural model (Fig. 2).

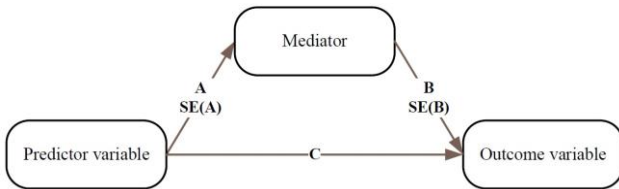


Fig. 2: A schematic diagram of a mediation model

IV. RESULTS

The structural model evaluation results in tables 5 to 6 show the results for our hypothesis testing. Consistent with H1a, the results in table 5 show that ex-ante relational governance is negatively associated with the use of contractual governance ($p < 0.05$). Therefore, H1b that assumes the positive relationship between ex-ante relational governance and contractual performance is rejected. In H2, we predict that using ex-ante relational governance is positively associated with the use of ex-post relational governance. The results show that the impact is positive and very significant with $p < 0.001$. Therefore, H2 is supported. Based on H3, we expect that undertaking ex-post relational governance correlate positively with the use of contractual governance. Our results support H3, because the correlation score is positive and the p-value is less than 0.001 representing a very significant relationship.

For testing H4 that predicts the mediation effect of ex-post relational governance on the relationship between ex-ante relational governance and contractual governance, we conducted sobel test. As shown in table 6, the sobel test statistics show a very significant effect ($p < 0.001$). Therefore, H4 is supported. Fig. 3 shows the validated model.

TABLE 5: STRUCTURAL MODEL EVALUATION

	Original Sample	Sample Mean	Standard Deviation	Standard Error	T Statistics
Contractual Gov. -> Proj Perf	0.3919 *	0.3861	0.1538	0.1538	2.5488
Contractual Gov. -> Relationship Perf	-0.1468	-0.1456	0.1434	0.1434	1.0238
Ex-ante Relational Gov. -> Contractual Gov.	-0.2445 *	-0.2474	0.1076	0.1076	2.2720
Ex-ante Relational Gov. -> Ex-post Relational Gov.	0.5640 ***	0.5684	0.0880	0.0880	6.4124
Ex-ante Relational Gov. -> Proj Perf	0.1525	0.1579	0.1411	0.1411	1.0809
Ex-ante Relational Gov. -> Relationship Perf	-0.1297	-0.1110	0.0959	0.0959	1.3516
Ex-post Relational Gov. -> Contractual Gov.	0.5881 ***	0.5871	0.1137	0.1137	5.1727
Ex-post Relational Gov. -> Proj Perf	-0.0690	-0.0602	0.1573	0.1573	0.4383
Ex-post Relational Gov. -> Relationship Perf	0.3848 *	0.3760	0.1662	0.1662	2.3153
Proj size -> Proj Perf	-0.2738 *	-0.2717	0.1153	0.1153	2.3748
Proj size -> Relationship Perf	0.1875 *	0.1816	0.0898	0.0898	2.0883

Note: Critical t-values for a two-tailed test are 1.96 * (significant level = 5%), 2.58 ** (significant level = 1%), and 3.29 *** (significant level = 0.1%).

TABLE 6: SOBEL TEST RESULTS FOR EVALUATING MEDIATION EFFECT OF EX-POST RELATIONAL GOVERNANCE

Independent variable	Dependent variable	Mediator	A	SE(A)	B	SE(B)	Sobel test Statistics	Two-tailed probability
Ex-ante Relational Gov.	Contractual Gov.	Ex-post Relational Gov.	0.5640	0.0880	0.5881	0.1137	4.056 ***	0.000

Note: Critical t-values for a two-tailed test are 1.96 * (significant level = 5%), 2.58 ** (significant level = 1%), and 3.29 *** (significant level = 0.1%).

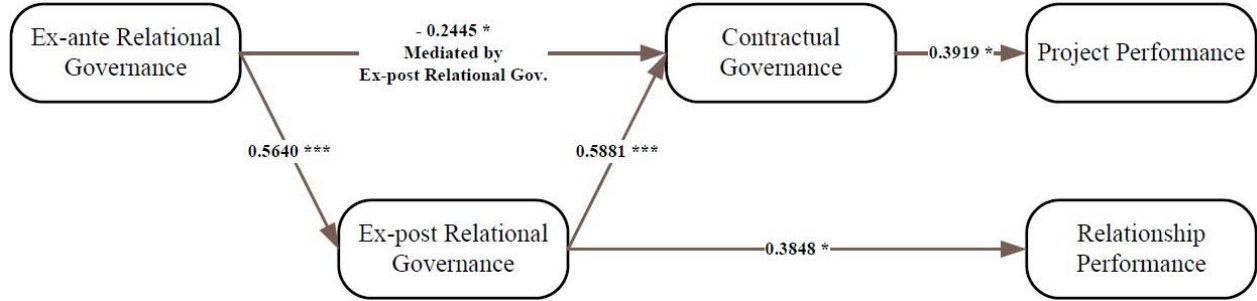


Fig. 3: Validated model

V. DISCUSSIONS AND CONCLUSIONS

In this section, the findings from the results reported above are summed up first and then the implications for theory and practice are discussed. This study finds that the three forms of governing the client-contractor relationships in project settings interact and impact on project performance jointly. Specifically, consistent with the view that trust and shared norms have substitutive relationships with contractual governance [34, 63], the results show that ex-ante relational governance impacts negatively on formal contracts or having a substitutive relationship with them. The study also finds that ex-post relational governance mediates the effect of ex-ante relational governance on contractual governance. Finally, the study reports that while ex-post relational governance has positive effect on relationship performance, project performance is accounted for by contractual governance.

A. Theoretical implications

Previous studies on governance mechanisms have often treated relational governance as a unidimensional construct which is one of the main reasons for having inconsistent findings on the relationship between relational and contractual governance mechanisms. Following Zhao and Wang [66], this study distinguishes two types of relational governance mechanisms, namely ex-ante relational governance and ex-post relational governance, and empirically analyzes how these interact and impact on project performance. Adding to literature, this study finds that the relationship between relational governance and contractual governance is not binary as portrayed in the current debate [49, 57]. Instead, the two different forms of relational governance as conceptualized in this study impact on contractual governance and project performance differently: Ex-ante governance is both substitutive and complementary with contractual governance; and, Ex-post governance is

complementary with contractual governance. The higher the social capital between the client and the contractor, the less the need to rely on contractual governance—the substitutive relationship between ex-ante relational governance and contractual governance. However, the higher trust also facilitates the exchange of information and collaboration between the two sides (Ex-post relational governance) and such collaboration and information enable the two sides to specify, in much detail, a much more sophisticated contract without incurring very high costs as in the case of no such collaboration. Implicitly or explicitly, such contracts become the main instruments for governance. As a consequence, contractual governance directly impact on aspects of project performance that can be well specified such as time and cost. Ex-post relational governance impacts directly on relational performance of the project.

The findings indicate that by distinguishing ex-ante and ex-post relational governance, the inconsistent findings on the substitutive vs complementary relationships between relational governance and contractual governance can be reconciled. For example, in Lui & Ngo [34], the relationship was found substitutive. However, further examining the survey instrument we found that it mainly measures ex-ante relational governance. Similarly, examining Fryxell et al. [15], the focus is on ex-post vs contractual governance and the finding of complementary is consistent with the framework presented above in Figure 3.

Nevertheless, caution needs to be excised when generalizing the findings from this study across different types of projects or industries or cultures. The findings are based on a relatively small sample in the construction industry in Australia. Further studies are needed to validate the findings in other contexts. For example, in countries without an enforceable system of property rights, contracts cannot be relied upon to enforce expectations and promises [45]. Therefore, our notion of complementary or the

mediation role of contracts is unlikely to apply in these countries.

A further limitation of the 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. Considering the evolution of social capital and changes in social exchanges and contractual provisions and their effect on cooperative performance could be a useful extension of this research.

Finally, though we studied the client-contractor relationships, our data has been entirely collected from contractors. Although there is evidence about consistency of perceptions across exchange partners [e.g., 3, 64], future research could extend this work by including a wider sample of participants from both sides of partnerships.

B. Managerial implications

It is important for practitioners to be aware of the need to have a mixture of Ex-ante, Ex-post relational governance and contractual safeguards because they interact with each other and jointly impact on performance. Although high trust initially diminishes the need for a sophisticated complete contract, such trust typically leads to more collaboration and exchange of project-specific information which will further enrich the contract. Ultimately, the contract becomes the effective mechanism for governing the delivery of the project. This is consistent with observations that organizations that practice "relationship contracting" typically develop comprehensive contracts in parallel to their efforts to develop or maintain collaborative and trusting relationships with their contracting partners. Although contracts in these situations were often described as a safety net or last resort, the terms and conditions still serve as the cornerstones of the project deliverables.

When project complexity is low and it is feasible to develop complete contractual safeguards without incurring excessive costs, contract is an effective governance mechanism, although could be enhanced by relational governance mechanisms. Where project complexity is high and it is impossible or too costly to develop complete contractual safeguards initially, improving information sharing and collaboration are likely to enhance the relationship between the contracting parties and to add to the sophistication of the contract and thus the effectiveness of contract as a joint governance mode for project delivery.

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