

Article

Influence of Project Governance on Opportunistic Behavior: Taking a Dynamic Perspective

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Abstract: The importance of project governance in curbing opportunistic behavior (OB) has been clearly established in the project literature. Although contract governance and trust are considered critical factors that explain project governance, there is a lack of understanding regarding their interplay at various stages of project development. The current study takes a dynamic perspective and breaks down contract governance into contract completeness (CC) and contract enforcement (CE), while differentiating ex-ante trust from ex-post trust. As such, the current study takes a dynamic perspective and the Grossman-Hart-Moore (GHM) model, which aims to investigate how each of the two facets of contract governance and trust intertwine during the management of construction projects as well as their effects on OB. We undertook a questionnaire survey of individuals involved in 342 construction projects in China, and our research results show that, first of all, governance mechanisms at different stages have different inhibitory effects on OB. Taking contract-signing as the boundary, the governance effect of a contract is gradually enhanced, while the governance effect of trust is gradually reduced. Second, ex-ante trust is more important than ex-post trust: the former moderates not only the relationship between CE and OB, but also the influence of CC on OB. Finally, a contract that is overly complete is not conducive to precluding OB, as such completeness can give the contract parties a sense of security that is guaranteed. The current study not only garners insights into project governance research but also provides implications for architectural practitioners in deploying resources that relate to governance mechanisms.

Keywords: contract completeness; contract enforcement; ex-ante trust; ex-post trust; opportunistic behavior



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1. Introduction

Opportunism has been viewed as an important barrier to project success [1]. Project governance, as an important means and measure in suppressing opportunism, has been widely studied by scholars [2–4]. In recent years, a large number of scholars have explored the relationship between project governance and opportunistic behavior (OB), including factors such as contract governance and trust [2,4]. In terms of contract governance, some scholars suggest that contract completeness can be improved by designing contract terms, structure, and performance to constrain OB [5,6]. In terms of relationship governance research, scholars have explored a variety of dimensions inherent in the relationship between trust and opportunism. Previous studies have shown that trust can reduce opportunism tendencies, coordinate conflicts, and reduce transaction costs [7]. Additionally, some scholars have studied the complementary and alternative relationship between contract governance and trust; nonetheless, there is no consensus on this issue [8]. For example, Blomqvist, Hurmelinna, and Seppanen [9] point out that contract governance and trust promote each other, and that a good-quality, detailed contract can promote trust and hinder opportunism. However, some scholars believe that a “perfect” contract governance system established between organizations can reduce their reliance on trust relationships, and that contract governance can in this way constrain the positive role of trust [10,11].

According to the Grossman-Hart-Moore (GHM) model [12], the aforementioned inconsistent results can stem from ignoring changes in project governance and opportunism status after the signing of the contract. Research on project governance is mostly grounded in a static perspective [13]. In terms of contract governance, such research considers the impact of contract completeness on OB, but only from a static perspective; that research suggests that completeness leads to contract governance becoming too rigid, making it unable to cope with changes in the external environment (e.g., contractor nonperformance with regard to the contract and the inability to respond to OB in a timely manner) [14]. In studying the concept of trust, scholars have developed a variety of dimensions [15]; nonetheless, most fail to acknowledge that the trust state changes with time. As time passes, the contracting parties frequently interact on the basis of a cooperative relationship, and thus come to know each other's preferences and interests [16]. Such knowledge can further affect opportunism tendencies. Unfortunately, few studies discuss the dynamic perspective of project governance, including contracts and trust.

Based on the above viewpoints, the current study takes a dynamic perspective, and it introduces the GHM model and takes up contract-signing as the node of interest to break down contract governance into contract completeness and contract enforcement. Additionally, we divide trust into ex-ante trust and ex-post trust. On the whole, it is necessary to consider contract governance and trust in line with the various stages of a construction project and explore how they dynamically interact and ultimately influence OB. To this end, the current study analyzes and explores the interaction between contract governance and trust, and the influence of that interaction on the emergence of OB; it also proposes that ex-ante trust can regulate the effect of contract completeness and contract enforcement on OB, that contract completeness can regulate the effect of ex-post trust on OB, and that ex-post trust can regulate the impact of contract enforcement on OB.

2. Theoretical Background

2.1. Contract Governance

Contract governance relates to the relationship between organizations that are governed by formal contracts [17]. The theoretical logic of contract governance comes from transaction cost economics (TCE), which believes that OB is widespread and can both increase transaction costs and hinder the establishment and maintenance of long-term partnerships [18]. Therefore, under TCE, enterprises need to establish formal contracts to restrict the OB of trading partners [19]. In addition, Oliver E. Williamson [20] proposes that a contract's status changes after it is signed on account of external environmental changes (e.g., information asymmetry) [12].

Compared to relationship governance, contract governance has relatively clear binding terms and a mandatory binding force. When both parties in a transaction and a cooperative partnership need to clearly define the objectives, roles, and processes therein, contract governance has strong applicability [21]. In addition, even when a contract is comprehensive and detailed, it may be executed to varying degrees [21]. In this respect, contract governance should not be limited to contract completeness: it should extend to contract enforcement [22].

2.1.1. Contract Completeness

Transaction cost theory is the main theory for analyzing contract completeness. The extensive literature on contract analysis based on TCE shows that, firstly, the more quasi-rent (related to asset specificity) that can be exploited in a particular transaction, the more the parties want the contract to be long-term in order to protect themselves from opportunistic behavior [23]. Complete, and try to avoid renegotiation; second, when the transaction is more uncertain, the parties want the contract to be short-term and incomplete, so as to avoid falling into a long-term unfavorable contractual relationship; and the increase of transaction frequency inhibits opportunistic behavior. This, in turn, reduces the need for oversight [24]. Optimal contract incompleteness is a function of asset specificity, uncertainty,

and transaction frequency. In classical relevant empirical research, contract price terms and contract length were first used to represent the degree of contract incompleteness. However, these two methods are clearly only partial measures of contract incompleteness. Saussier believes that a contract is more complete than other contracts if it defines the transaction and its means of realization more precisely [25]. Looking at specific construction projects, there is always a big difference in the clarity of the project contracts in the following eight aspects [26]: (1) the calculation of the project price; (2) the contract duration; (3) if the owner breaches the contract, he must pay a penalty; (4) penalties that contractors must pay in case of default; (5) progress payment rules; (6) conflict resolution clauses; (7) incentives for on-time completion; and (8) incentives for early completion. This difference is clearly related to the transaction attributes of specific construction projects.

2.1.2. Contract Enforcement

Post-contract execution is critical to project performance. Economic theory assumes that contracts are enforceable once they are signed [27]. However, according to transaction cost theory, benefits and costs determine whether and to what extent a contract can be enforced [28]. Changes in external conditions, lack of understanding of the contract, and clarity of the contract can also cause the contract to not be fully enforced. Most of the existing research is devoted to exploring from an empirical perspective how to design contracts to suppress opportunistic behavior in the process of construction performance and make contracts fully enforceable [29]. In fact, contract execution is also part of the governance mechanism, and whether the project can achieve the expected performance depends on the execution of the contract. Yao & Chen [30] provide an understanding of contract enforcement. According to their research framework [30], the current research on contract execution mainly includes three directions: the first is the premise of contract execution. For example, different cultures will affect the understanding of the contract by both parties, resulting in execution deviation [31]. The second is the result of the execution of the contract. Ning believes that the effectiveness of contract governance refers to its effect of safeguarding the interests of the parties to the contract and coordinating the behaviors of both parties. The third is the influencing factors on contract execution, such as reputation [32]. On the basis of the above research, scholars gradually realize that the dimension of contract governance should be extended to the stage of contract execution.

Therefore, the current study takes as the third aspect of contract governance contract enforcement, which speaks to the degree to which contracts are strictly executed in the post contract stage to protect interests [1]. Based on the aforementioned viewpoints and combined with the GHM model, the current study divides contract governance into contract completeness before signing the contract and the execution of the contract after signing it [23].

2.2. Trust

Trust, in the current study context, is the belief that a trading partner will act with integrity and consideration for the interests of the other party [33]. Good trust and shared norms protect inter-organizational transactions and cooperation through self-reinforcing constraint mechanisms [34]. Therefore, trust can play a positive role in transactions and cooperation when good communication and collaboration, information-sharing, joint decision-making, and joint problem-solving are needed [35]. Trust is a multidimensional concept; Rousseau believed that trust can be divided into three dimensions—namely [26] calculus-based, relational, and institution-based trust. Hartman [11], on the other hand, believes that trust within a project includes competence trust, integrity trust, and intuitive trust. Wong [18] established an engineering project trust framework that consists of system-based trust, cognition-based trust, and affect-based trust, and he developed a scale by which to measure trust in engineering projects on this basis; they tested this scale's reliability and stability using a structural equation model.

Based on the GHM model and dynamic perspective, and while taking the signing of a contract as the time node, the current study divides trust into ex-ante and ex-post trust. From McKnight, Cummings, and Chervany [13], dynamic perspective, ex-ante trust is static trust based on prequalification and negotiation in the early stage of signing, while ex-post trust is dynamic, continuous trust that is based on contract execution and other activities. Ex-ante trust includes confidence in competence and honesty, and the trust level is based on preliminary information such as prequalification and reputation; ex-ante trust is leveraged to select contractors [36]. Ex-post trust characteristics are based on cognitive and emotional bases, and ex-post trust itself comes from the renewal of ex-post trust (e.g., satisfaction with the contractor's work) [37].

2.3. Opportunism

Ö. Williamson [20] defines opportunism as “self-interest seeking with guile”, and includes misdirection, distortion, forgery, confusion-sowing, and other behavior. In construction projects, contractors often exhibit OB in line with their own interests and to the detriment of the interests of the owners or other parties [38]. According to the literature, contractor OB involves cheating behavior, wherein they pursue their own interests at the expense of those of owners by concealing or distorting information, withdrawing commitments, violating agreements, exercising private control, or evading obligations in construction projects [39].

In the context of construction, opportunism manifests as a wide range of behaviors. For example, contractors may take advantage of loopholes (such as weather or contracts) to gain additional revenue, or take advantage of accidents to change the contract terms [1]. All the participants of a construction project hope to derive as much benefit as possible, and the existence of OB within that project would destroy confidence and trust on both sides of the cooperative relationship [40]. Opportunism always connotes the gain of benefits at the expense of others, and it will always lead to disputes between the two parties involved—disputes that can result in a decline in project quality and construction delays [41]. Opportunism also undermines the post factor trust established between the partners.

3. Research Methods

3.1. Contract Governance and Opportunism

In a state of “contract completeness”, a relatively complete contract not only represents a clear specification of contract terms, it also broadly includes various issues, properly covers contingencies, and clearly lays out the obligations of all parties involved [42]. The more complete a contract, the more clearly both parties can define the goals to be achieved, the roles to be played, and responsibilities to be assumed, and the process by which supervision and penalties for violations takes place [43]. Contract defects and ambiguous contract boundaries constitute the main underpinnings of opportunism, and so a clear and complete contract is helpful in precluding problems and constraining opportunism [44]. W. Lu et al. [27] show that by defining and describing key clauses in detail when drafting contracts and clarifying general principles and guidelines with regard to various accidents, the owners can to a certain extent regulate the behavior of contractors and suppress the occurrence of OB. From the research results of Bernheim, Peleg, & Whinston [43] one can see that detailed contract terms may encourage the implementation of behavior not specified in the contract. Based on the results of previous studies, the current study puts forward the following hypothesis.

Hypothesis 1 (H1a). *Contract completeness negatively correlates with contractor OB.*

In addition to contract completeness, contract enforcement can also be used to guarantee construction project performance. The owner's strict implementation of contractual arrangements tends to involve rational supervision and certain control measures to increase the contractor's awareness of the obligations and responsibilities described in the contract

and further promote compulsory cooperation [45]. A contract's strong legal binding force, along with measures that promise severe punishment, help deter contract breaches and opportunism [1]. Al Qady's [5] field experiment results show that higher earnings can increase employee trust in employers, and thus promote the contract execution and reduce OB. W. Lu et al. [27] propose that during contract execution, the owner can solve problems by expressing them clearly and sharing information with the contractor; doing so would not only constrain OB, but also effectively avoid triggering contract enforcement, which would be detrimental to the two parties' relationship. Based on these derivations, we set forward the following hypothesis.

Hypothesis 1 (H1b) . *Contract enforcement negatively correlates with contractor OB.*

3.2. Trust and Opportunism

Ex-ante trust speaks to one party's trust in the abilities of another party, and it informs good-faith trust; this is the condition that pushes both parties to sign a contract. Das and Teng [34] believe that a good relationship basis can deepen cooperation between the owner and the contractor and facilitate communication outside the contract, thus reducing the risk contractor opportunism. Yadong Luo [45] proposes that, in line with the contract's degree of flexibility, setting various degrees of initial trust prequalification can effectively preclude the problem of a high probability of opportunism on the part of the contractor. Lonsdale et al. [46] propose the research idea of "relationship embedding—trust mechanism—opportunism", where relationship embedding would generate a high degree of initial trust and effectively limit OB among enterprises. Although ex-ante trust does not constrain contractor OB and lacks sufficient risk assessment, decision-making based on optimism can develop trust and reduce the risk of opportunism [47]. Based on these findings within the literature, we propose the following hypothesis.

Hypothesis 2 (H2a). *Ex-ante trust negatively correlates with contractor OB.*

H2a: Ex-post trust mainly derives from the renewal of ex-post trust and the foundation of emotional connections, which are in turn characterized by cognitively based trust and emotionally based trust. Ex-post trust encourages the transparent and intensive exchange of information; it helps reduce information asymmetry, and with it, contract parties learn how to coordinate among organizational interfaces [48]. At the same time, ex-post trust is generated and maintained through long-term and regular communication reciprocity, which is symbolic of inter-organizational cooperation and encourages all parties to coordinate interests and commit to common goals; in this way, it reduces the occurrence of OB. Over time, trust leads to the emergence of shared understanding and common cognition, such as daily communication and interaction between the contracting parties. The parties can promote common information disclosures and timely problem-solving adjustments [49] to inhibit the occurrence of OB.

Based on these points, we propose the following hypothesis.

Hypothesis 2 (H2b). *Ex post trust negatively correlates with contractor OB.*

3.3. Moderating Effect of Trust

As mentioned, ex-ante trust is characterized by competency-based trust and honesty-based trust; it promotes psychological security, mitigates perceived risk, and leads to positive expectations by one party with regard to the other. Therefore, in the presence of ex-ante trust, both parties are willing to exchange information and negotiate specific contract contents on the premise of pre-existing trust. The research results of Fischer, Huber, and Dibbern [49] show that in cases where there is pre-trust between the parties, they will be more inclined to sign flexible contracts. Fischer et al. [49] found that ex-ante trust can enhance the mutual understanding of all parties with regard to complex tasks and improve contract completeness. Similarly, in the presence of such trust, the parties may be able to remove any inadequacies or ambiguities from the product, thereby enhancing

the technicality of the terms. The analysis undertaken by Girmscheid and Brockmann [10], based on expert interviews, also points out that a trust relationship between the owner and the contractor can reduce the other's demand for contract completeness or rigidity. S. O. Cheung, Wong, Yiu, and Pang [18]; Zaghoul and Hartman [4] speak of the promotion effect of trust on contract flexibility, which to some extent compensates for fear accruing to insufficient information; it can also, for this reason, alleviate the opportunism that derives from fear.

Ex-post trust is characterized by a cognitive basis and an emotional basis. Lau and Rowlinson's [13] study found that in engineering projects, trust serves as the lubricant for successful transactions, in that it can reduce the friction that otherwise emerges during contract enforcement. Pinto et al. [1] empirically verified that competence-based and honesty-based trust is conducive to improving the job satisfaction of both parties with regard to executing the contract and contributing to project success. Concurrently, trust is conducive to reducing moral hazard and OB in executing contracts to ensure their smooth and effective execution.

Based on these points, we propose the following hypotheses.

Hypothesis 3 (H3). *Ex-ante trust can moderate the effect of contract enforcement (H3a) and contract completeness (H3b) on OB.*

Hypothesis 4 (H4). *Ex-post trust can moderate the correlation between contract enforcement and OB.*

3.4. Moderating Effect of Contract Completeness

The binding role of the contract enables the partner to fulfill their obligations in accordance with the requirements [26]; on the other hand, the guarantor role of the contract can help put the partner at ease. Therefore, the more detailed and rigorous a contract is, the more conducive it will be to establishing mutual trust. However, on the other hand, the more complex and complete the contract is, the more likely it is to create resistance from either party [15]; this can lead to uncertainty during project implementation and failure to achieve the ideal governance effect. Based on these findings, we propose the following hypothesis [50].

Hypothesis 5 (H5). *Contract completeness can moderate the correlation between ex-post trust and OB.*

Based on the above hypotheses (H1–H5), we develop the conceptual framework of this study, as shown in Figure 1.

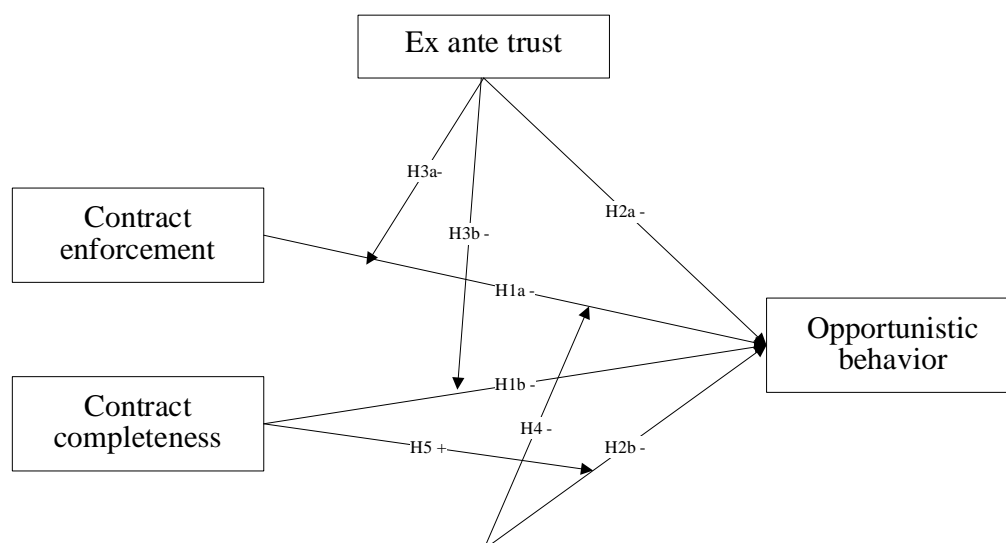


Figure 1. Theoretical framework. Note: source own elaboration.

4. Research Method

4.1. Data Source and Collection

In this study, we collected through an online survey the experience data of Chinese construction industry professionals; this survey made use of a five-point Likert scale. The potential respondents were provided with the following information pertaining to the questionnaire.

(1) Please consider a recent and specific project you are implementing or participating in, and answer the remaining questions.

(2) Please fill in the questionnaire according to the actual project conditions.

(3) The data gathered through this survey will be used solely for academic research purposes; the data will remain anonymous and do not involve personal interests or business secrets. Information pertaining to you and your company will remain strictly confidential.

We assured the potential respondents of the confidentiality of their data to keep them objective and neutral during the answering process, and to reduce the interference of psychological burden and various related factors.

This questionnaire was collected online over a 13-month period. We collected a total of 518 questionnaires which were screened to delete (1) questionnaires with missing data, (2) questionnaires for which all variables had the same score; and (3) questionnaires that were completed within a very short time. In all, there were 342 valid questionnaires (effective recovery rate: 66.02%). The questionnaire covered the behavior of owners, contractors, and engineering consulting units, and the respondents themselves comprised project managers, contract and business managers, technical personnel, and the like. In all, 74% of the respondents held a Bachelor's degree or higher, 45% have more than 10 years of work experience, and 43% of the targeted projects were housing construction projects. Table 1 presents specific information with respect to the interviewees.

Table 1. Demographic Characteristics of the Sample.

Measurement	Characteristics	Frequency	Percentage (%)
The role in the project	Owner	63	18
	Contractor	57	17
	Engineering consulting unit	192	56
	Others	30	9
Professional qualifications	Project manager	98	29
	Contract or Business Manager	66	19
	Technical specialist	83	24
	Others	95	28
Education level	Below undergraduate	54	16
	Bachelor degree	187	55
	Postgraduates	92	27
	Doctor and above	9	2
Work experience	<3 years	89	26
	3–5 years	39	11
	6–10 years	62	18
	>10 years	152	45
Project type	Housing	146	43
	municipal	107	31
	Port and waterway	28	8
	Others	61	18
Project duration	<2 years	114	33
	2–5 years	211	62
	6–10 years	15	4
	>10 years	2	1

Note: source own elaboration.

4.2. Measurement

(1) Contract enforcement

We referenced the three questions put forward in the questionnaire of S. Lu and Hao [51], and modified the wording to align with the research background and measure contract enforcement. For example, during project implementation, the contract has a strong legal binding force on both parties.

(2) Contract completeness

The term “contract completeness” refers to Ning’s [52] four detailed contract drafting measurement items. For example, the contract precisely describes the work scope (CC1).

(3) Trust

We posed three questions proposed by Pinto et al. [1] to measure ex-ante trust. For example, the owner believes that the other party has the ability to perform productively (EAT1). At the same time, we leveraged four questions proposed by S. O. Cheung et al. [12] to measure ex-post trust. One such question item is: “Good interaction allows us to obtain more information from the other party”.

(4) Opportunism

In line with Luo et al. [42] and Shi, Chen, You, & Yao [23] the four measurement items were appropriately modified to measure OB. For example, for the research purposes of the current study, “The major 3PL often hides important information from us” was changed to “The contractor does not fully disclose certain information, to protect its own interests”.

(5) Control variables

To eliminate the influence of other factors that may relate to the current study, we reference previous studies [53] and take as control variables the respondent’s role in the project, their professional qualifications, their education level, their work experience, and the project type and duration.

Table 2 shows specific information with scale items.

Table 2. Scale items.

Variable	Measurement Items	Referred Sources
Contract enforcement	During the implementation of the project, the contract has strong legal binding force on both parties. (CE1) The contract provides for severe punishment against the party in breach. (CE2) For work beyond the scope of the contract, a work commitment agreement shall be signed prior to commencement of work. (CE3)	[12]
Contract completeness	The contract precisely describes the work scope (CC1) The contract precisely describes the specification and standards in decoration (CC2) The contract precisely defines how disagreements will be resolved (CC3) The contract precisely defines the changes and adjustment clauses (CC4)	[9]
Ex ante trust	The owner believes that the other party has the ability to perform productively. (EAT1) The owner believes that technical and managerial personnel from the other party are competent. (EAT2) The owner believes that the other party will keep their word throughout the life of the project. (EAT3)	[46]
Ex post trust	Good interaction allows me to obtain more information from the other party (EPT1) Attending work-related interaction frequently facilitates better understanding between individuals (EPT2) The owner trusts the contractor to take his interests into account when making decisions (EPT3) Having a good personal relationship with the other party may also improve working relationship with him/her (EPT4)	[11]

Table 2. Cont.

Variable	Measurement Items	Referred Sources
Opportunistic	The contractor does not act in accordance with the contract text or agreement (OB1)	[27]
	The contractor unilaterally suspends or terminates the contract (OB2)	
	The contractor does not disclose certain information fully to protect its own interests (OB3)	
	The contractor sometimes makes oral promises without actually doing them (OB4)	

Note: source own elaboration.

5. Data Analysis

We used SPSS v25.0 and Mplus v8.3 software to undertake data analysis: we used the former to construct the structural equation modeling, and the latter to analyze its reliability and validity.

5.1. Reliability and Validity Check

To assess the internal consistency and reliability of the scales, we used Mplus v8.3 to examine the factor loadings of all constructs. The results showed that all factor loadings exceeded 0.7, thus indicating that the index reliability was quite ideal. Meanwhile, the average variance extracted (AVE) of all variables exceeded 0.5, thus indicating that all variables achieved convergent validity.

5.2. Confirmatory Factor Analysis

We used Mplus v8.3 to conduct a confirmatory factor analysis for five variables—namely, contract enforcement, contract completeness, ex-ante trust, ex-post trust, and opportunism. We found that Chi-Square = 331.366, Chi-Square/df = 2.651 < 3.0, CFI = 0.952 > 0.9, TLI = 0.941, IFI = 0.959, RMSEA = 0.069 < 0.1, and SRMR = 0.039 < 0.05; all values satisfied acceptable levels. Concurrently, as Table 3 shows, the correlation coefficient between variables is smaller than the square root of the AVE of its own variable, thus indicating that there is good discriminative validity among the variables.

Table 3. Convergence validity and Reliability Analysis table.

Dim.	Item	Parameters of Significant Test		Item Reliability	Composite Reliability	Convergence Validity	Discriminate Validity				
		Estimate	p-Value				CE	CC	EAT	EPT	OB
CE	CE1	0.888	***	0.789	0.847	0.650	0.806				
	CE2	0.809	***	0.654							
	CE3	0.713	***	0.508							
CC	CC1	0.818	***	0.669	0.904	0.702	0.775	0.838			
	CC2	0.850	***	0.723							
	CC3	0.817	***	0.667							
	CC4	0.865	***	0.748							
EAT	EAT1	0.870	***	0.757	0.904	0.759	0.637	0.618	0.871		
	EAT2	0.892	***	0.796							
	EAT3	0.852	***	0.726							
EPT	EPT1	0.874	***	0.764	0.893	0.678	0.560	0.603	0.776	0.823	
	EPT2	0.885	***	0.783							
	EPT3	0.701	***	0.491							
	EPT4	0.820	***	0.672							
OB	OB1	0.739	***	0.546	0.874	0.634	−0.181	−0.114	−0.130	−0.108	0.796
	OB2	0.764	***	0.584							
	OB3	0.842	***	0.709							
	OB4	0.836	***	0.699							

Note: source own elaboration. Bold numbers in diagonal row are square roots of AVE, the lower triangle is the Pearson correlation of dimensions. *** $p < 0.001$.

5.3. Hypotheses Testing

We undertook hierarchical regression analyses with the help of SPSS v25.0 to test the effects of contract governance and trust on OB and the moderating effects of contract governance and trust. As Table 4 shows, Model 1 is the baseline model that includes the control variables. Model 2 adds to this baseline model the independent variables contract enforcement (CE), contract completeness (CC), ex-ante trust (EAT), and ex-post trust (EPT); Model 3 includes control variables, independent variables, and regulating functions. To reduce multicollinearity, we re-examined the independent and regulatory variables in a decentralized manner to test the regulatory effects.

Table 4. Standardized Coefficient Estimates of Regressions.

	Opportunistic Behavior (OB)		
	MODEL 1	MODEL 2	MODEL 3
The role in the project			
Professional qualifications			
Education level	0.017	0.005	−0.019
Work experience			
Project type			
project duration			
Professional qualifications	0.042	0.037	0.037
Education level	−0.073	−0.067	−0.086
Work experience	0.034	0.031	0.019
Project type	0.089	0.09	0.087
Project duration	0.025	0.038	0.017
CE		−0.088 **	−0.155 **
CC		−0.022 *	−0.14 *
EAT		−0.078 **	−0.157 **
EPT		−0.024 **	−0.144 *
EAT×CE			−0.169 **
EAT×CC			−0.201 **
CC×EPT			−0.138 *
EPT×CE			−0.210 **
R ²	0.035	0.061	0.089
ΔR ²	0.018	0.032	0.050

Note: source own elaboration. CE = Contract enforcement; CC = Contract completeness; EAT = Ex ante trust; and EPT = Ex post trust. ** $p < 0.01$. * $p < 0.05$.

Our research results confirm the inhibitory effect of dynamic trust and contract governance on OB. As Table 4 shows, according to Model 2, contract enforcement ($\beta = -0.155$, $p < 0.01$) and contract completeness ($\beta = -0.14$, $p < 0.05$) have negative effects on OB; these findings support H1b and H1a. Ex ante trust ($\beta = -0.157$, $p < 0.01$) and ex-post trust ($\beta = -0.144$, $p < 0.05$) negatively correlate with opportunism, thus supporting H2a and H2b.

Table 4 shows the results of Model 3 regarding the interactions between EAT, CE, CC, and EPT. Figures 2–5 show the interactions based on the results of the interactions. First, as Figures 2 and 3 show, ex-ante trust increases the impact of contract completeness (EAT × CE) ($\beta = -0.201$, $p < 0.01$) and contract enforcement ($\beta = -0.169$, $p < 0.01$) on opportunism, respectively; these findings support H3a and H3b. Second, as Figure 4 shows, contract completion reinforces the influence of ex-post trust (CC × EPT) ($\beta = -0.138$, $p < 0.05$) on OB, and H4 is supported. Finally, as Figure 5 shows, ex-post trust reinforces the effect of contract completion (EPT × CE) ($\beta = -0.210$, $p < 0.01$) on opportunism, with the assumption that H5 is supported.

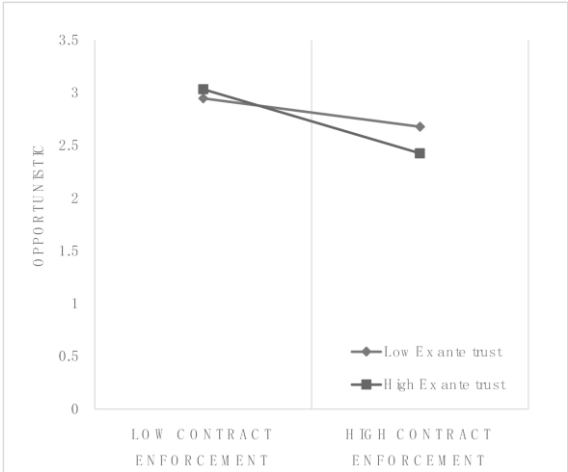


Figure 2. Interaction effect of EAT and CE.

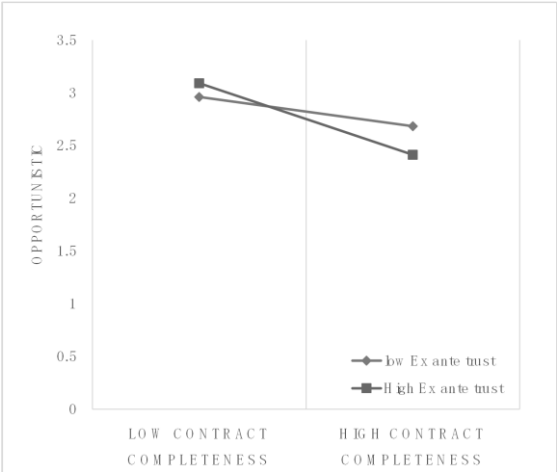


Figure 3. Interaction effect of EAT and CC.

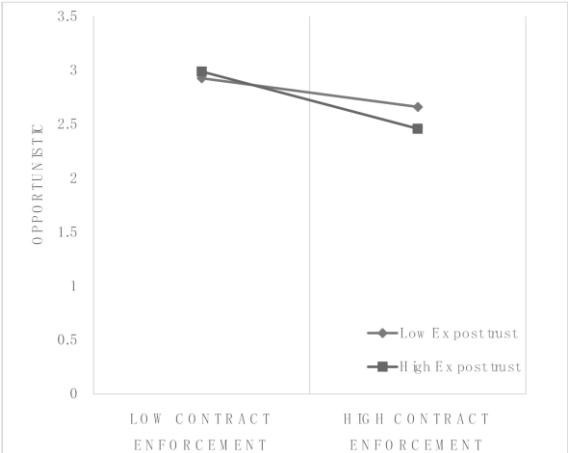


Figure 4. Interaction effect of EPT and CE.

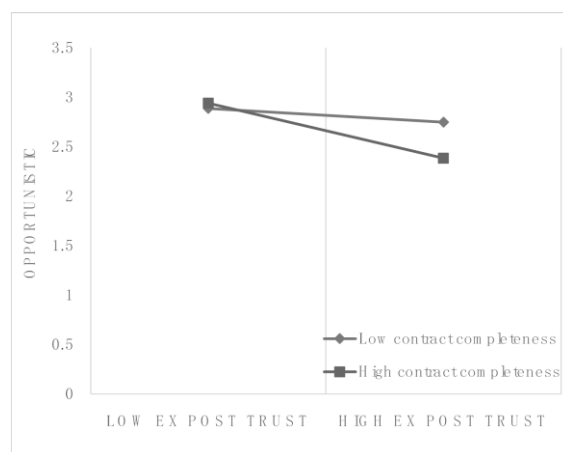


Figure 5. Interaction effect of CC and EPT. Note: source own elaboration.

6. Discussion

6.1. Theoretical Contributions

Our research findings contribute to the theoretical literature in three main ways.

First, our study findings confirm the effects of dynamic contract governance and trust on OB. We leveraged the GHM model of Grossman and Hart [12] in our study of project governance; according to the GHM model, contract governance is divided into contract completeness and contract enforcement, and trust into ex-ante trust (i.e., before contract signing) and ex-post trust (i.e., after contract signing). Whereas previous studies [51] leverage a static governance hypothesis, we propose and verify hypotheses regarding the influence of contract enforcement, contract completeness, ex-ante trust, and ex-post trust on OB. Meanwhile, our conclusions extend further [40] with regard to the influence of contract completeness on OB—that is to say, improving contract completeness can increase the interdependence of contracting parties and inhibit opportunism.

Second, our study speaks to the complexity of ex-ante trust and ex-post trust in regulating the impact of contract governance on OB. Competence-based trust, honesty-based trust, cognition-based trust, and affect-based trust reinforce the effect of contracts on OB. At the same time, our study further deepens the aforementioned research results—that is, we found ex-ante trust to be more influential than ex-post trust, and that while ex-ante trust simultaneously regulates the effect of contract enforcement and contract completeness on opportunism, ex-post trust can regulate only the effect of contract enforcement on opportunity.

Finally, the direct and indirect effects of contract completeness on OB are more complex than previous studies assert [28]. Unlike the findings of Girmscheid and Brockmann [10], our findings prove that contract completeness is sufficient in regulating the negative correlation between ex-post trust and OB. Possible reasons for the divergence in findings are differences in institutional framework and political ideology among the various study countries, which could have led to certain differences in basic trust [3]. At present, trust in the construction market within China, for example, remains at low levels; for this reason, there is a reliance in this country on complete contracts, not only to make both parties feel that their interests are protected, but so that trust can be established.

6.2. Comparison of the Findings of This Study with Existing Studies

This study extends the research content of the static governance assumption [19,27], confirming that contract enforcement, contract completeness, ex-ante of trust and ex-post trust on opportunistic behavior. At the same time, this study further deepens the research results of Hartman [11], Wong et al. [18], confirming that ex-ante trust is more influential than ex-post trust, and ex-ante trust regulates both contract execution and

contract execution. The most significant influence on opportunism is completeness, while ex-post trust can only moderate the effect of contract execution on opportunity.

6.3. Practical Implications

First, it is more important to establish a good initial trust relationship between the owner and the contractor than to maintain this trust relationship afterwards. The owner should establish as-perfect-as-possible indicators before a contract is signed, and consider only contractors for whom the owner has a high level of trust. For example, the owner should set out detailed and feasible indicators of competence, qualification, and experience in the prequalification period, when bidding documents are being prepared. Concurrently, owners can get to know potential partners through a variety of channels and evaluate their credit rating. On the other hand, by maintaining a good history of cooperation with a variety of contractors, owners can help build trust quickly.

Second, the owner should create a contract that is as perfect as possible. In contract negotiations, the owner should guide the contractor in drawing up such a clear and detailed contract so as to preclude post event disputes and mitigate the risk of opportunism. At the same time, during the contract-drafting process, the parties should set down the principles and procedures by which unexpected situations will be managed so that the contract has certain flexibility; doing so is also important to ensuring smooth contract implementation.

Finally, maintaining good ex-post trust can facilitate smooth contract implementation. After the contract is signed, attention should be paid to maintaining ex-post trust: (1) during contract execution, both parties should promote ex-post trust through frequent interaction and by sharing knowledge as much as possible, and (2) whenever ex-post trust has been damaged and cannot be repaired, the contract should be strictly implemented so as to reduce the occurrence of opportunism.

7. Conclusions and Limitations

We sought in the current study to explore the impact of contract governance and trust on opportunistic behavior (OB), from a dynamic perspective. To that end, we empirically analyzed data captured through questionnaires completed by 342 construction practitioners in China.

Our analytical results show that the occurrence of opportunism can be constrained to a certain extent by contract enforcement, contract completeness, ex-ante trust, and ex-post trust. Second, ex-ante trust can strengthen contract completeness and contract enforcement, and thus inhibit opportunism. Contract completeness can modulate the effect of ex-post trust on OB. In other words, the greater the integrity of the contract, the stronger the constraining effect of ex-post trust with regard to OB. Finally, ex-post trust enhances the effect of contract completeness on opportunism. The current study complements the existing research on the impact of project governance on OB from a dynamic perspective; it also speaks to the complementary role between contract governance and trust.

Although this study makes some contributions to the theoretical and practical literature, it does have some limitations. First, this study takes China's construction industry as its research background; it does not take into account situations seen in other countries or industries. Future research can test research hypotheses that relate to the promotion of international engineering projects, or it can include organizational culture, system, and legal frameworks as moderating variables. Second, this study does not elucidate the transmission mechanism between project governance and OB from the perspective of state; therefore, future research could examine the mediating variables between project governance and OB, such as equity perception and risk-sharing.

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