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WHEN CAPITAL MEETS CONTROL: GOVERNANCE DILEMMAS OF FINANCIAL INVESTORS IN PPP PROJECTS

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Abstract. While financial investors typically provide substantial share of capital in Public Private Partnership (PPP) Projects, they frequently lack meaningful operational control, leaving them vulnerable to opportunism from both government entities and contractors (i.e., industrial investors). This study investigates these unique governance challenges through a dual trajectory approach: first, by developing a comprehensive PPP governance theoretical model specifically tailored to financial investors' needs, and second, by empirically validating this model through an in-depth case analysis of a financial investor's innovative governance practices. The research makes three significant contributions to the field: First, it reconceptualizes financial investors as distinct stakeholders with specialized governance requirements in PPP ecosystems. Second, it advances a holistic theoretical model comprising 19 critical governance elements across institutional, organizational, contractual, and managerial dimensions. Third, it derives four practical, evidence-based strategies for maintaining control while preserving partnership viability: 1) implementing contractor profit-sharing mechanisms to align incentives, 2) developing integrated risk-transfer structures, 3) establishing joint government-contractor oversight systems, and 4) creating debt service reserve funds from construction margins to mitigate government payment delays. These findings offer both theoretical insights and actionable solutions for improving financial investor protection in PPP arrangements.

Keywords: Public-Private Partnership (PPP), project governance, financial investor, opportunistic behavior, stakeholder, risk, project benefits.

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1. Introduction

Public Private Partnerships (PPPs) have been widely adopted as a mechanism for delivering infrastructure projects globally, offering benefits such as risk-sharing, improved efficiency, and access to private sector financing and expertise (Yescombe, 2011). While extensive research has explored PPP success factors, risks, and governance from the perspectives of governments and private consortia, limited attention has been paid to the role of financial investors, such as investment banks, pension funds, sovereign wealth funds, insurance companies, and private equity funds, despite their growing significance in PPP financing (Levitt & Eriksson, 2016). The post-2008 financial landscape appears to have contributed to notable changes in PPP financing patterns, with some studies suggesting that traditional construction firms reduced equity participation due to balance sheet constraints (Hueskes et al., 2017). This vacuum has been filled by financial investors, lured by infrastructure's inflation-hedging characteristics and stable cash flows (Inderst, 2011). Yet their participation reveals a fundamental contradiction: while contributing substantial project capital, financial investors typically lack operational control (Emerson & Nabatchi, 2015). This misalignment between capital contribution and governance power creates what may be termed the "PPP investor paradox" in many PPP settings, financial investors may bear substantial financial exposure while having relatively limited influence over operational decisions.

Governance, broadly defined, refers to the processes and structures that guide decision-making and accountability. The United Nations Economic Commission for Europe (United Nations Economic Commission for Europe [UNECE], 2008) describes it as "the processes in government actions and how things are done, not just what is done". Wilson et al. (2010) further elaborate that governance involves the allocation of authority, responsibility, and accountability at the highest organizational level. This conceptualization underscores the importance of systematic oversight in achieving corporate and project objectives.

Corporate governance, as outlined by du Plessis et al. (2005), focuses on regulating and managing corporations to balance organizational goals with stakeholder interests, including societal impacts. The Organisation for Economic Co-operation and Development [OECD] (2004) emphasizes that corporate governance provides a framework for setting objectives and resolving conflicts among stakeholders. While corporate governance typically prioritizes long-term shareholder returns, its principles are adaptable to PPP contexts, particularly due to the extended timelines of such projects (Wilson et al., 2010). Project governance, distinct from corporate governance, addresses the unique and temporary nature of projects. Wilson et al. (2010) define it as a framework for structuring resources, communication, and monitoring to align projects with organizational vision. However, as Aas and Bekker (2014) note, there is no universally accepted definition of project governance. Renz (2007) describes it as a process-oriented system for strategic direction and integrative management, while the PMBOK® (Project Management Institute [PMI], 2017) frames it as the alignment of project objectives with broader organizational strategy. These perspectives highlight the need for tailored governance models in PPPs, which often span 20–30 years and involve complex stakeholder dynamics.

Governance plays a pivotal role in determining the success or failure of PPP projects. Johnston and Gudergan (2007) identify three primary lenses for analyzing PPP outcomes: value-for-money considerations, risk management, and governance. Effective governance ensures that PPP projects align with public interests, mitigate risks, and deliver long-term value, making it a critical factor in project performance (Xiong et al., 2019).

Given the centrality of governance to PPP success and the increasingly important yet underexamined role of financial investors in the PPP ecosystem, the consequences of the "PPP investor paradox" are particularly profound. Financial investors face systematic exposure to opportunistic behavior from two interrelated sources: governments and industrial investors. On the one hand, governmental opportunism manifests through stringent concession clauses and retrospective regulatory interventions. As Levitt and Eriksson (2016) show, some concession contracts may include stringent provisions that limit claims for construction overruns, thereby transferring certain risks to private investors. Beyond contractual design, governments may also engage in "creeping expropriation" by altering regulatory or policy conditions after financial close (Engel et al., 2013). Such practices exploit the relative immobility of financial investors, who, unlike industrial partners, lack credible leverage to withdraw technical capabilities or operational resources. On the other hand, industrial investor (contractor) exploitation arises from conflicts of interest inherent in their dual roles as contractors and equity holders. Design–build (DB) or engineering–procurement–construction (EPC) contractors may prioritize short-term construction profits over long-term project performance (Liu et al., 2020; Park et al., 2020). Ho et al. (2015) conceptualize this phenomenon as the "unbalanced profit pool syndrome", showing how contractors, often holding as little as 10–15% equity, can manipulate change orders and quality compromises to extract construction margins that far exceed their equity returns.

To attract more financial capital into PPPs, effective governance strategies must address these challenges. Levitt and Eriksson (2016) propose measures such as independent board chairs, probity auditors, and fixed-price contracts to mitigate conflicts between financial and industrial investors. Additionally, Park et al. (2020) emphasize the need for financial investors to actively monitor construction partners, particularly during high-risk phases like bidding and construction. However, despite these insightful recommendations, comprehensive and systematically implemented governance practices tailored to the needs of financial investors remain scarce in both academic literature and real-world PPP application (Darko et al., 2023; Kwofie et al., 2021; Levitt & Eriksson, 2016).

To address this gap, this study is guided by the following research questions. First, what are the distinctive governance contexts, constraints, processes, and challenges faced by financial investors in PPP projects, given their capital-intensive but control-limited position? Second, how do institutional, organizational, contractual, and managerial governance factors interact to shape financial investors' exposure to opportunism and risk across the PPP project lifecycle? Third, what governance mechanisms and strategic practices can financial investors adopt to mitigate opportunistic behavior by key stakeholders, protect their interests, and simultaneously enhance overall PPP project performance? By addressing these questions, this study seeks to develop and empirically validate a financial-investor-centric governance model for PPP projects and also derive actionable governance strategies for financial investors operating in complex institutional environments.

2. Methodology

This study employs a dual-trajectory research design (see Figure 1), which begins with two analytically differentiated lines of inquiry and converges through systematic comparison and synthesis to extract theoretical and practical implications.

The first trajectory, the theoretical pathway, employs an integrative literature synthesis to develop a financial investor-oriented PPP governance framework. This process builds upon established theories of project management, project governance, and institutional analysis, and selectively refines existing governance typologies to align with the risk–return logic of financial investors. Specifically, the framework draws on extant classifications of PPP governance (e.g., Xiong et al., 2019) and links them to project efficiency and long-term value creation, under the moderating role of risk. Particular emphasis is placed on interpreting governance mechanisms through the distinct pri-

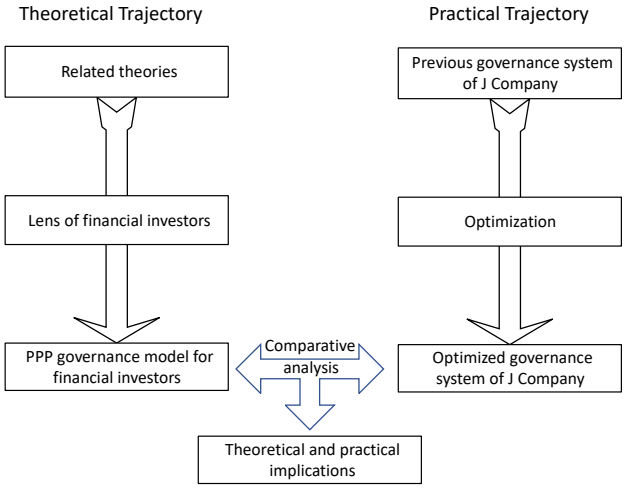

Figure 1. Research design

orities of financial investors, including capital protection, risk allocation, accountability, and lifecycle value realization (Emerson & Nabatchi, 2015; Gatti, 2013). Methodologically, this trajectory follows a theory-informed conceptual refinement approach, in which existing constructs are consolidated, reinterpreted, or selectively excluded based on conceptual proximity and stakeholder relevance. In this sense, the objective is not to derive a new governance model inductively, but to adapt and extend established frameworks into a structured and context-sensitive configuration.

The second trajectory – the practical pathway – employs a single embedded case study design to examine governance practices of financial investors in PPP infrastructure delivery. The case study adopts a theory-informed, qualitative-dominant mixed-data approach to document and analyze the evolution of a financial investor's post-investment monitoring and management (PIMM) framework, rather than evaluating a static set of governance strategies. The focal case is a financially sophisticated institutional investor with extensive PPP experience which, through years of PPP project engagement, identified limitations in its existing governance framework and subsequently initiated an internal, structured process of reflection and improvement.

Data collection and analysis followed an evolutionary and problem-driven sequence, mirroring the firm's own governance optimization process. First, the firm's existing PIMM framework and related internal governance documents were reviewed to establish the baseline governance logic and to identify areas of tension between formal design and implementation experience. Second, an internal organizational survey, covering key functional domains including risk control, operations, engineering, and finance, was deployed as a diagnostic instrument to systematically confirm governance pain points, implementation gaps, and coordination challenges encountered in practice, and to inform potential directions for improving the PIMM framework. Building on the survey findings and documentary analysis, a revised PIMM plan template was then developed to address the identified gaps and to enhance governance effectiveness.

This methodological choice case study is appropriate given the exploratory nature of the research question, the process-oriented focus on governance mechanisms, and the institutional and contractual complexity inherent in PPP projects (Yin, 2018). While reliance on a single case inevitably limits statistical generalizability, the selected case offers high analytical value for this research. Specifically, J Company confronts a broadly observed "PPP investor paradox", whereby financial investors are expected to exercise effective governance while operating under constrained contractual authority and fragmented project interfaces. Empirical materials capturing how such tensions are recognized and addressed in practice are rare and difficult to obtain, rendering this case particularly valuable. Moreover, the firm's iterative revision of its PIMM framework reflects a rigorous and practice-oriented governance optimization process. Although the resulting PIMM plan may not represent a universal best practice, it demonstrates a comparatively advanced, effective, and operationally feasible approach to post-investment governance. Importantly, the case does not aim to verify the proposed theoretical framework in a confirmatory sense; rather, it contributes through analytical falsification and refinement, by revealing gaps and limitations in existing governance models and motivating their improvement. The case also provides actionable insights with strong relevance for financial investors engaged in PPP projects which have not been explicitly discussed in prior PPP governance studies (e.g., Levitt & Eriksson, 2016; Park et al., 2020).

An alignment scheme was developed to map observed governance practices to the previously constructed governance model. Governance mechanisms and issues were systematically extracted and coded based on the revised PIMM plan. In line with pattern-matching logic (Yin, 2018), the empirical evidence was then compared with the theoretical governance model to assess areas of convergence and divergence. This comparative analysis ultimately generated three outcomes: (1) identification of theoretical blind spots where existing governance models fail to accommodate real-world constraints, (2) diagnosis of practical shortcomings in J Company's governance arrangements, and (3) synthesis of actionable lessons to enhance the strategic governance capacity of financial investors in PPPs.

2.1. A financial investor-centric governance model for PPP projects

This study adopts a structured integrative synthesis approach to develop a financial investor-centric governance model for PPP projects by combining complementary strands of PPP governance research. Rather than relying on a single theoretical lens, the model is informed by four interrelated literature streams that together capture the key analytical dimensions relevant to financial investors: (1)

governance content (i.e., core governance components), (2) lifecycle-specific governance requirements, (3) governance–performance linkages aligned with financial investors' objectives, and (4) risk. These streams are systematically integrated through a theory-informed process of conceptual synthesis and refinement.

The governance framework for PPP projects proposed by Xiong et al. (2019) provides the primary analytical foundation. Based on a social network analysis of 52 case studies, it identifies 21 governance issues across four dimensions: institutional, organizational, contractual, and managerial. Specifically, institutional issues include authority, legislation, regulation, and market openness; organizational issues include transparency, trust, cooperation, communication, public participation, and stakeholder involvement; contractual issues include risk allocation and sharing, political support, credibility, easy specification and measurability, and flexibility; and managerial issues include capability, competition, accountability, affordability, innovation, economic feasibility, and financial accessibility.

Building on this baseline, the present study applies a purposive refinement process to adapt the framework to a financial investor perspective. First, conceptually proximate institutional elements (authority, legislation, regulation, and market openness) are consolidated into a single compliance construct, reflecting their shared function as externally imposed governance constraints. Second, the element of affordability is excluded, as it predominantly concerns public-sector objectives rather than the decision logic of financial investors (Xiong et al., 2019). Through these explicit transformation rules, the original set of 21 issues is refined into 18 governance elements, thereby maintaining conceptual coherence while enhancing stakeholder relevance.

The framework is further enriched by incorporating insights from Zhang et al. (2015), which introduces a lifecycle perspective spanning development, construction, operation, and transfer stages. This perspective ensures that governance elements are not treated as static constructs but are instead contextualized according to phase-specific governance requirements and evolving institutional conditions. Such an approach is particularly important for PPP projects, where governance priorities shift across the lifecycle in response to changing risk profiles and stakeholder interactions.

In addition, the model integrates the governance–performance linkage emphasized by Zwikael and Smyrk (2014), who distinguish between short-term project efficiency (e.g., on-time and on-budget delivery) and long-term strategic benefits. This distinction aligns closely with financial investors' primary objective of sustained financial returns rather than mere project completion. This perspective is further supported by Samset and Volden (2015) and Rolstadas et al. (2014), who emphasize that governance must ensure not only delivery outputs but also the realization of intended long-term benefits.

Risk is incorporated as a central moderating factor linking governance and performance. Prior studies highlight that risk significantly influences governance effectiveness and project outcomes (Lewis et al., 2002; Zwikael & Smyrk, 2011; Cui et al., 2012). Moreover, Das and Teng (2001) distinguish between relational risks (e.g., opportunistic behavior) and performance risks (e.g., market and regulatory uncertainties), both of which are highly relevant in PPP contexts. These risks exhibit strong lifecycle dependency: relational risks tend to be more salient during construction due to intensive stakeholder interaction, whereas performance risks persist throughout the operational phase. This reinforces the need for governance mechanisms that are both risk-sensitive and phase-specific.

The four literature streams and their roles in model construction are summarized in Table 1.

Building on these integrated foundations, the proposed model (see Figure 2) adopts a financial investor-centric lens, emphasizing actionable governance practices that support both risk mitigation and value creation. The resulting framework comprises 18 governance elements across four dimensions – institutional, organizational, contractual, and managerial – which collectively shape PPP project performance and investor returns. Importantly, the effectiveness of these governance mechanisms is dynamically moderated by risk factors and varies across different phases of the PPP lifecycle.

Table 1. Mapping of literature streams and model construction logic

Literature stream	Key references	Role in model construction	Analytical integration / refinement approach
PPP governance elements	Xiong et al. (2019)	Baseline identification of 21 governance issues across four dimensions	Core framework adopted; institutional elements (authority, legislation, regulation, market openness) merged into compliance; affordability removed
Lifecycle governance in PPPs	Zhang et al. (2015)	Introduces lifecycle perspective (development–construction–operation–transfer)	Used to contextualize governance elements across phases
Governance–performance linkage	Zwikael and Smyrk (2014); Samset and Volden (2015)	Links governance to efficiency and long-term benefits	Used to define outcome variables (efficiency vs. benefits)
Risk as moderator	Das and Teng (2001); Cui et al. (2012)	Positions risk between governance and outcomes	Conceptualized as key variable across lifecycle

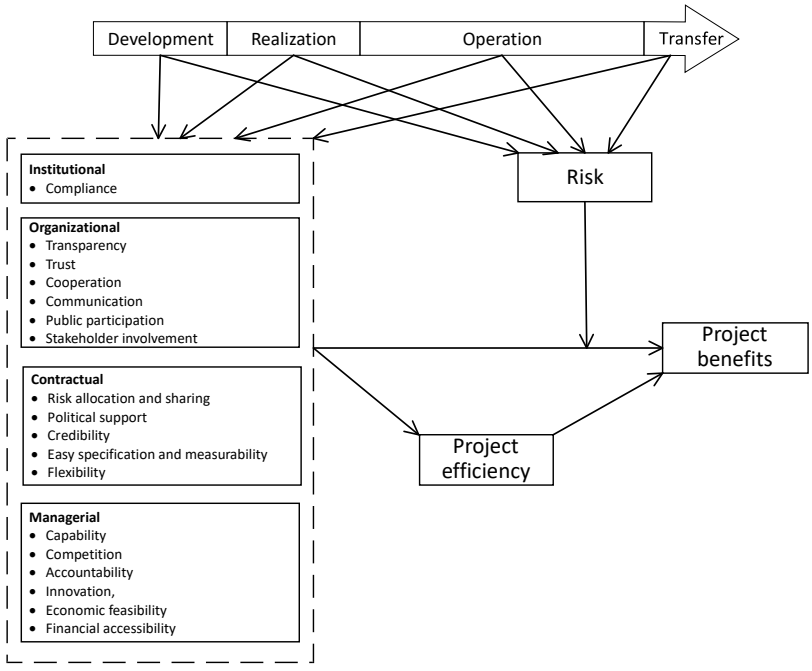

Figure 2. Theoretical governance model for financial investors in PPP projects (adapted from Lewis et al., 2002; Samset & Volden, 2015; Xiong et al., 2019; Zhang et al., 2015; Zwikael & Smyrk, 2014)

2.2. Case study

2.2.1. Project background

J Company is a specialized investment firm with a decade of proven experience in the financial sector. Since its inception, the company has strategically invested in more than 50 projects, with cumulative investments surpassing 1.5 billion US$. In recent years, it has expanded its portfolio by participating in six PPP projects as a financial investor. The company maintains a lean yet highly skilled workforce of over 30 professionals. Notably, the majority of its employees possess extensive experience in banking, trust, and fund management, ensuring a strong foundation in financial analysis, risk assessment, and investment strategy.

The X PPP Project ("X Project") was implemented by a project company (special purpose vehicle, SPV) established jointly by J Company (holding 90% equity), the local government (holding 7% equity), and a construction firm (holding 3% equity). The project involved the construction of a 7-kilometer road and ancillary facilities within an industrial park, with a total investment of 51 million US$. It adopted the Build-Operate-Transfer (BOT) model, featuring a 10-year cooperation period, including 1.5 years for construction and 8.5 years for operation and maintenance. The project utilized a government payment mechanism, offering an investment return rate of 7.8%. The equity ratio was 20%, with the remaining 80% financed through bank loans.

As the financial investor, J Company was primarily responsible for capital contributions and financing arrangements, while the construction firm handled engineering and construction, cost control, and later operation and maintenance.

The SPV was formally established in July 2017, with construction commencing shortly thereafter. However, the financing process encountered significant delays due to compliance reviews conducted by the Ministry of Finance (MoF). Consequently, the bank loan was not finalized until November 2018, featuring an interest rate benchmarked at the five-year Loan Prime Rate (LPR) plus 25 basis points. Further delays were attributable to external factors including stringent environmental inspections and government-mandated design modifications. These cumulative challenges resulted in a 15-month delay in construction completion relative to the original schedule. Notably, despite these setbacks, the project maintained an exemplary safety and quality record throughout the construction period.

2.2.2. Governance challenges faced by J Company during the construction phase

Despite implementing comprehensive control measures, J Company encountered persistent difficulties in its PIMM system, particularly during the construction phase of X Project. These operational inefficiencies primarily stemmed from:

Limited Control Over the SPV

As a financial investor introduced after the project's tender, J Company had limited familiarity with early-stage project conditions and weaker government relations compared to the industrial investor, i.e., the EPC contractor/operator, which primarily handled communications between the SPV, local government, and various government agencies. Although J Company held 90% equity in the SPV, its decision-making power was constrained by a board voting

mechanism requiring a two-thirds majority. Consequently, despite its majority stake, J Company could not exercise full control over critical decisions. Furthermore, the SPV's weak control in construction management, evidenced by the government frequently bypassing it to directly oversee project execution, significantly heightened J Company's exposure to financial and operational risks.

Inadequate Construction Management Capabilities

As a purely financial investor, J Company lacked the technical expertise to independently assess costs or supervise construction activities. This weakness became particularly apparent when evaluating government-initiated change orders, such as a 2.4 million US$ increase in landscaping costs. Without third-party technical consultants, the company had to rely entirely on the contractor's submitted payment requests to approve progress payments, leaving it vulnerable to inflated claims and misrepresented progress reports, thereby increasing its financial risk exposure.

Government Interference and Eroded Influence

The project's heavy reliance on government viability payments created an asymmetric power dynamic. Government agencies often bypassed formal governance channels, issuing direct instructions to the contractor. As a result, repeated design modifications led to cost overruns and schedule delays, while systematically excluding J Company from substantive decision-making processes.

Asymmetric Risk-Reward Allocation

The risk allocation framework placed a disproportionately heavy burden on J Company, requiring it to assume full responsibility for financing guarantees and government payment coordination throughout the project's extended duration. By contrast, the industrial investor's risk exposure was primarily limited to the construction phase, while preserving multiple profit channels through change orders and cost-control incentives. Crucially, despite established profit-sharing arrangements, the "unbalanced profit pool syndrome" (Ho et al., 2015) enabled the industrial investor (i.e., the EPC contractor) to secure financial benefits from EPC contract margins, while transferring most risks associated with government payment delays and cost overruns to J Company.

To further assess the governance issues and identify measures to improve project governance, J Company conducted an internal investigation, which employed a combination of questionnaire survey and in-depth interviews, covering 28 core personnel from J Company's headquarters and the SPV involved in the project. The survey participants were strategically selected from four core functional areas: operations management (project oversight team), risk control (compliance auditors), finance (investment analysts), and engineering (technical supervisors), ensuring comprehensive coverage of all critical project aspects. The survey subjects (see Table 2) demonstrated significant professionalism and representativeness: 64.29% had over 10 years of work experience, 88.14% had more than three years of PPP project management experience, 42.86% were from the headquarters, 25% from the SPV, and 32.14% held positions in both entities. This composition ensured the comprehensiveness and reliability of the survey results.

The interview findings reveal some key deficiencies in the current PIMM system, including: 1) Inadequate corporate governance in the SPV, resulting in insufficient control, 2) Deficiencies in technical knowledge and management capabilities among SPV executives, 3) Lack of engineering professionals within the team, 4) Low motivation levels among SPV staff, 5) Weak oversight of the company's official seals and certificates, 6) Insufficient financial controls over the SPV, 7) Inadequate executive-level engagement with PIMM, 8) Absence of effective construction management systems, 9) Room for improvement in project management, 10) Lack of support from external engineering specialists, 11) Insufficient corporate oversight and support for project financing, 12) High financing costs with

Table 2. Demographic characteristics of survey participants (source: internal questionnaire survey)

Indicator	Type	Sample Size	Percentage
Work Experience	0–3 years	1	3.57%
	3–5 years	1	3.57%
	5–10 years	8	28.57%
	Over 10 years	18	64.29%
	Total	28	100%
PPP Project Experience	Less than 1 year	0	0%
	1–3 years	5	17.86%
	3–5 years	10	35.71%
	Over 5 years	13	46.43%
	Total	28	100%
Affiliation	Headquarters	12	42.86%
	Project Company	7	25%
	Headquarters & Project Company	9	32.14%
	Total	28	100%

significant maturity mismatch risks, 13) Poor coordination with government clients on project oversight, 14) Insufficient communication with regulatory authorities, 15) Defective partner selection process, resulting in incompetent construction partners, and 16) Deficient profit-sharing and risk allocation mechanisms with the contractor.

The questionnaire survey corroborated these findings, with 92.86% of respondents indicating the PIMM system required substantial improvements, highlighting a clear imperative for reform. Respondents evaluated twelve proposed enhancement measures on a 5-point efficacy scale (1 = least effective, 5 = most effective). The highest-rated interventions were "Improve oversight and support for project financing" (4.46), "Enhancing financial control and support" (4.36), "Enhance collaboration with the government in project oversight" (4.36), and "Strengthen contractor management and risk allocation" (4.25), "Enhancing staff incentives" (4.14). These prioritized measures offer a pathway for optimizing the governance framework of the X Road PPP project (see Table 3).

2.2.3. Optimized PIMM Plan for PPP projects by J Company

Based on survey findings, J Company developed a standardized PIMM plan tailored to PPP construction-phase challenges. This template is designed for scalability across current X Project and future PPP projects where J Company serves as a financial investor. The template synthesizes three critical inputs: 1) Empirical pain points identified in the X Project, 2) J Company's decade-long experience in infrastructure investing, including lessons from prior PPP engagements, and 3) Benchmarking against domestic and international best practices in financial investor governance (e.g., UNECE's probity auditing standards and OECD's risk allocation principles).

Figure 3 is generated through a structured content analysis of J Company's standardized PIMM plan. Specifically, the written PIMM procedures, rules, and checklists were systematically reviewed to identify (i) the core governance components embedded in the plan and (ii) the stakeholder groups assigned responsibilities, approvals, oversight, or information-sharing roles within each component. The identified component–stakeholder linkages were then coded and aggregated to map the interaction structure and lines of accountability prescribed by the PIMM plan, which were finally visualized as Figure 3. As visually summarized in Figure 3, the PIMM plan comprises seven core components, each engaging distinct stakeholder groups. While the complete PIMM documentation contains sensitive operational details, this section provides a concise overview of the framework and its seven fundamental components.

Corporate Governance and Organizational Structure of the SPV

To ensure dominance, J Company requires a minimum equity stake of 67% and exercises control through the shareholders' meeting, board of directors, and supervisory board. The board is predominantly composed of members nominated by J Company, with the chairman appointed by J Company and concurrently serving as the legal representative. The supervisory board includes representatives from all stakeholders. The SPV adopts a flat management structure, with key positions held by J Company personnel on a part-time basis. Departments such as Administration & HR, Finance, and Construction Management are established, with department heads appointed by J Company's corresponding divisions, while general/rank-and-file staff are recruited externally. J Company formulates the *PPP Project Investment Management Measures* and *Post-Investment Supervision Rules* to ensure compliance and operational control.

Corporate Document and Seal Control Plan for the SPV

The management of corporate documents (e.g., incorporation certificates and business licenses) and seals is a critical measure for J Company's oversight of the SPV. The custody of document and seals follows the principle of "department-specific custody with assigned accountability".

Table 3. Proposed PPP project governance enhancement measures for J Company (source: internal questionnaire survey)

Rank	Measures to enhance project governance	Mean	SD*
1	Tighten financial and payment controls for the project company	4.46	0.82
2	Improve oversight and support for project financing	4.36	0.81
3	Enhance collaboration with the government in project oversight	4.36	0.81
4	Strengthen contractor management and risk allocation	4.25	0.83
5	Enhance compensation incentives for project team members	4.14	0.99
6	Strengthen corporate governance of the project company to ensure absolute control	4.07	1.03
7	Enhance oversight of the project company's licenses and official seals	4.07	1.07
8	Strengthen comprehensive project management for construction works	4.07	0.80
9	Improve management and performance evaluation of personnel seconded to the project company	3.93	0.80
10	Recruit professional engineering and technical personnel	3.86	0.83
11	Strengthen supervision of management expense in the project company	3.5	1.02
12	Engage external professional institutions to assist in project oversight	3.21	1.05

Note: * – Standard deviation.

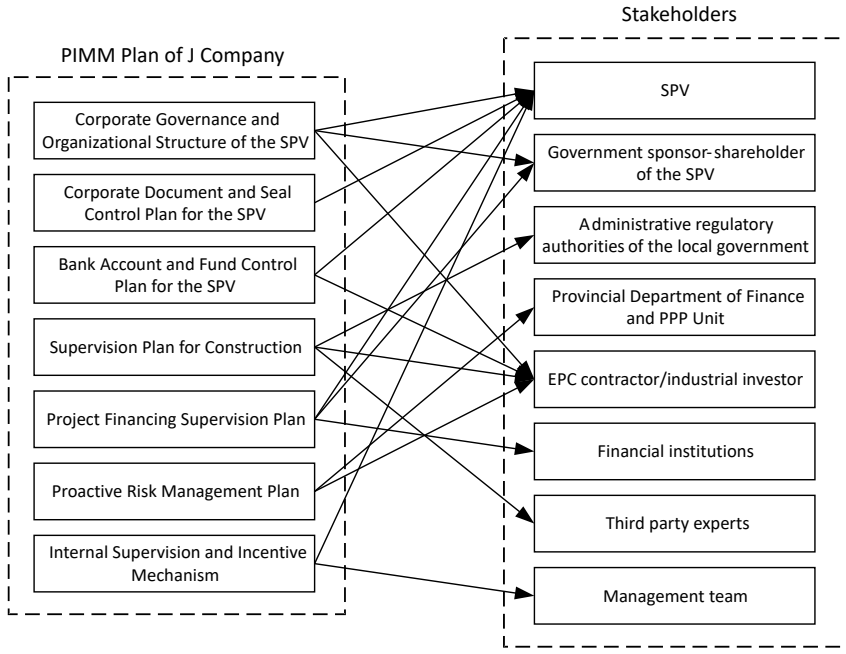

Figure 3. Components of the optimized PIMM plan of J Company linked to various stakeholders (developed by the authors based on J Company's PIMM plan)

The company document and seals are stored at the SPV 's premises, the legal representative's seal is kept by J Company's Risk Management Department, and financial seals are managed by J Company's Finance Department. The use of corporate document requires multi-level approval, while seal usage is categorized (e.g., routine documents, major matters, engineering contracts, non-engineering contracts) and subject to tiered authorization. Seal application must be strictly monitored, with blank-page stamping prohibited, and violations are penalized.

Bank Account and Fund Control Plan for the SPV

The management of bank accounts and funds is central to supervision during the PPP project's construction phase. Account opening follows a "dual-personnel, dual-role" internal control requirement, with reserved seals, online banking tokens, and other payment instruments centrally managed by J Company's Finance Department. Fund usage is classified ("construction-related", "non-construction-related", and "administrative expenses") with tiered approval based on amount thresholds. Payment processes undergo online review to ensure fund security.

Supervision Plan for Construction

The objective of construction supervision is to ensure compliance with contractual requirements on quality, safety, cost, and progress. J Company transfers construction risks to contractors through contractual agreements, focusing primarily on cost control. Payments are categorized into advance payments, progress payments, settlement payments, and retention money, with strict payment ratios – advance payments capped at 10% of the contract value and progress payments limited to 80% before project completion. Design modifications require rigorous approval, and changes exceeding budget are prohibited. J Company collaborates with government entities and third-party experts to oversee construction, ensuring smooth project execution.

Project Financing Supervision Plan

Project financing is critical to the success of PPP projects. J Company establishes a financing task force to ensure funding adequacy, cost efficiency, and term alignment. Conditions for capital injection include government confirmation of project inclusion in the Ministry of Finance PPP Database and issuance of a commitment letter. Financing solutions prioritize low-cost, low-risk options, with preference given to policy banks (e.g., China Development Bank and Agricultural Development Bank of China). Financing arrangements require internal approval from the SPV and J Company, with additional internal review for guarantees.

Proactive Risk Management Plan

To balance returns and risks, J Company establishes a profit-sharing mechanism with contractors, whereby a portion of construction profits is remitted to J Company. A debt service reserve fund is also implemented, requiring contractors to deposit 10–20% of the total project cost as a safeguard against delayed government payments, refundable upon timely repayment. Additionally, J Company maintains regular communication with provincial financial authorities (e.g., Department of Finance and the provincial level PPP Unit) to ensure policy compliance and government accountability.

Internal Supervision and Incentive Mechanism

J Company forms an internal audit team to periodically inspect corporate document and seal usage, fund management, construction oversight, and procurement com-

pliance within the SPV. Whistleblowing channels are established to enhance accountability. Performance-based incentives and target responsibility agreements motivate management teams to achieve project goals, ensuring effective supervision.

3. Results

3.1. The revised model

The comparative analysis employed a structured content analysis of J Company's PIMM plan to systematically identify actionable governance practices, which were then mapped to the theoretical model's 18 elements across institutional, organizational, contractual, and managerial dimensions (see Figure 2). This alignment followed the dual-trajectory methodology outlined in Section 3, utilizing pattern-matching logic (Yin, 2018) to evaluate convergence between empirical practices and theoretical constructs. The mapping revealed near-comprehensive coverage of the model, with all documented practices, except those pertaining to SPV governance structure (e.g., supermajority voting thresholds, integrated leadership roles). However, four theoretical elements (Trust, Public participation, Easy specification and measurability, Flexibility) lacked corresponding practices in J Company's PIMM plan. The dimension-practices mapping results are summarized below, with detailed alignments for each governance element presented in Figure 4.

The institutional dimension focuses exclusively on compliance through establishing systematic communication channels with provincial Department of Finance and PPP Unit to monitor regulatory updates and ensure adherence throughout all project phases. This includes proactive engagement and leveraging PPP Unit oversight during payment periods to guarantee fiscal obligations of the local government are met.

Institutional Dimension
- **[Compliance]**

J Company establishes a systematic compliance framework through:
1. Long-term communication mechanisms with provincial PPP Unit to track regulatory updates and policy trends.
2. Proactive engagement during project preparation to align with compliance requirements.
3. Leveraging PPP Unit oversight during government payment phases to ensure fiscal obligations are met.
4. Regular monitoring of the project's status in the Ministry of Finance PPP Database to avoid delisting risks.
5. Securing government commitments to include repayment obligations in annual fiscal budgets.

Organizational Dimension
- **[Transparency]**

J Company implements multi-layered transparency measures:
1. Financial Control: Headquarters directly manages project funds and contracts via finance and risk control departments.
2. Document and Seal Management: Strict protocols for seals (company chop, legal representative seal, financial seal, invoice seal) and licenses (business license, construction permits).
3. Dual Reporting: Project departments report to both local management and headquarters.
4. Information Disclosure: Key project milestones and financial flows are shared with stakeholders to ensure accountability.

- **[Trust]**

None
- **[Cooperation]**

J Company fosters collaboration through:
1. Government Integration: Government representatives participate in quality, safety, cost, and schedule oversight, especially in:
   - Construction measurement and valuation.
   - Progress payment approvals.
   - Change order management.
2. Contractor Involvement: Construction firms appoint deputy managers to oversee engineering quality, safety, and progress.
3. Joint Decision-Making: Major project decisions require input from all key stakeholders to ensure balanced interests.

- **[Public participation]**

None
- **[Communication]**

J Company maintains robust communication channels:
1. Regular meetings with government and contractors to address issues proactively.
2. Clear reporting lines to avoid misalignment between project teams and headquarters.
3. Whistleblower systems and cross-project inspections to enhance transparency.

- **[Stakeholder Involvement]**

J Company adopts a participatory approach:
1. Government Oversight: Authorities are involved in critical approvals to ensure compliance and reduce audit disputes.
2. Employee Feedback: Staff at all levels are encouraged to report concerns through formal channels.

Contractual Dimension
- **[Risk Allocation and Sharing]**

J Company employs sophisticated risk transfer mechanisms:
1. Contractor Risks: Fully transferred to contractors (quality, cost, safety, schedule).
2. Government Risks: Allocated via MoF PPP Database delisting clauses, land acquisition responsibilities, and payment delay provisions.
3. Some construction risks such as cost overruns partially assigned to government.

- **[Political Support]**

J Company secures government backing through:
1. Capital contribution tied to project listing in the MoF PPP Database.
2. Government payment commitments covering interest, guarantee fees, and advisory costs.
3. Legal assurances to include repayments in annual budgets.

- **[Credibility]**

J Company ensures reliability by:
1. Partnering exclusively with large state-owned contractors.
2. Requiring financial and performance guarantees from partners.
3. Maintaining strict bank account controls to prevent fund misuse

- **[Easy specification and measurability]**

None
- **[Flexibility]**

None

Managerial Dimension
- **[Capability]**

J Company strengthens execution through:
1. Strategic staffing with qualified professionals (e.g., engineers, financial experts).
2. A centralized construction management platform for oversight.
3. Training programs to enhance team skills in PPP project management.

- **[Competition]**

J Company optimizes financing by:
1. Selecting policy banks with strong government ties for favorable terms.
2. Comparing multiple bank offers to secure low-cost, low-risk financing.

- **[Accountability]**

J Company enforces responsibility via:
1. Multi-level supervision (internal audits, cross-project inspections).
2. Performance-based incentives for financing teams.
3. Clear consequences for non-compliance or mismanagement.

- **[Innovation]**

J Company adopts creative solutions:
1. Profit Sharing: Contractors rebate a portion of construction profits.
2. Debt Service Reserves: 10–20% of project value held as payment security.

- **[Economic Feasibility]**

J Company ensures viability by:
1. Targeting regions with strong fiscal health and stable investment climates.
2. Conducting thorough cost-benefit analyses before project initiation.

- **[Financial Accessibility]**

J Company secures funding through:
1. Preferred partnerships with policy banks.
2. Strict controls over bank accounts, online banking, and payment instruments.

Figure 4. Mapping J Company's PIMM plan to the PPP governance model (developed by the authors based on J Company's PIMM plan)

The organizational dimension showcases particularly robust mechanisms for transparency and stakeholder involvement. For transparency, J Company implements multi-layered controls including direct headquarters management of SPV finances through dedicated risk and finance departments, strict protocols governing use of all seals and corporate document, and a dual reporting system requiring project departments to answer to both local management and headquarters counterparts. Stakeholder engagement is comprehensive, with government representatives participating in oversight of quality, safety, cost and schedule matters, particularly for critical processes like payment approvals and change orders. The governance structure is meticulously designed, maintaining at least 67% equity for voting control, a carefully composed board requiring supermajority approvals while preserving government veto power for major decisions, and a lean management structure that combines key leadership roles. Notably absent, however, are formal mechanisms addressing trust-building and public participation – a strategic gap reflecting financial investors' typical focus on contractual and operational controls over relational governance aspects.

Within the contractual dimension, J Company employs sophisticated risk allocation strategies that fully transfer construction risks to contractors while creatively sharing operational risks with government partners through specific clauses addressing payment delays, cost overruns and other contingencies. The company ensures credibility through exclusive partnerships with major state-owned contractors and secures political safeguards by tying capital contributions to project being listed in the PPP Database of the Ministry of Finance (MoF) and obtaining comprehensive government payment commitments. However, the analysis revealed no corresponding governance practices related to output specification or contractual flexibility mechanisms in the PIMM framework – an omission that may reflect financial investors' prioritization of risk control over adaptive governance features.

The managerial dimension reveals J Company's operational excellence through strategic capability building, including staffing projects with qualified professionals and establishing construction management platforms at headquarters. Accountability is ensured through multi-level supervision systems combining internal audits, cross-project inspections and whistleblower mechanisms, complemented by performance-based incentives. Innovative financial practices like contractor profit-sharing arrangements and debt service reserves showcase creative solutions to investor-contractor alignment challenges. Strict financial controls govern all banking activities and fund flows through preferred partnerships with policy banks.

J Company's standardized PIMM plan has yielded a sophisticated governance system for its PPP projects, exhibiting robust alignment with established theoretical principles while addressing practical construction-phase challenges. However, the gaps identified in J Company's framework (particularly in trust-building, public participation, output specification, and flexibility mechanisms) clearly reflect the company's strategic prioritization of financial and operational controls over relational and contextual governance aspects. On the other hand, while the theoretical model achieves high coverage of J Company's governance practices, it notably overlooks SPV governance structure – a critical organizational governance element unique to long-term PPP projects (Wilson et al., 2010).

3.2. Key lessons learned

J Company's innovative approach to oversighting PPP projects offers four significant lessons that provide valuable insights for financial investors in infrastructure development. These practices demonstrate effective solutions to common challenges in PPPs while contributing to broader discussions on optimal PPP governance structures.

The profit-sharing mechanism stands out as a particularly effective strategy for aligning contractor interests with long-term project success. By requiring contractors to return a portion of construction profits based on project type and bidding conditions, J Company achieves multiple objectives. This arrangement not only partially offsets the investor's capital costs but also helps shift the contractor's focus from short-term construction gains to the longer-term performance of the project. In governance terms, such a mechanism can be understood as a contractual device for improving incentive alignment between financial investors and contractors, whose interests may otherwise diverge during the construction stage (Jensen & Meckling, 1976; Ho et al., 2015). It therefore helps mitigate the tendency of contractors to prioritize immediate construction profits over lifecycle outcomes. At the same time, the contractual safeguards against quality reduction ensure that this incentive adjustment does not come at the expense of project quality, thereby supporting a more balanced governance structure. This practice shows how financial investors can use relatively simple but targeted contractual arrangements to reshape contractor incentives in ways that better support project longevity.

A more comprehensive approach to contractor engagement involves both risk-sharing and equity participation. J Company's model requires meaningful contractor investment while simultaneously reducing their construction profit margins. This dual approach fundamentally transforms the contractor's role from a pure service provider to a genuine stakeholder with vested interests in project success. In governance terms, such an arrangement helps align economic exposure with decision-making influence, encouraging contractors to internalize the longer-term consequences of their construction-stage actions (Grossman & Hart, 1986; Jensen & Meckling, 1976). Contractors with substantial equity participation are therefore more likely to commit to quality and long-term performance. The risk-sharing components, particularly regarding government payment delays, further reinforce this alignment by distributing key uncertainties across parties rather than concentrating them on financial investors alone. This inte-

grated strategy addresses what Ho et al. (2015) identified as the "unbalanced profit pool syndrome", where contractors serving as investors may otherwise face conflicting priorities between construction efficiency and long-term asset performance.

The collaborative oversight model developed with government entities represents a structured approach to quality control and risk management. By establishing joint supervision over construction scope, quality, and progress, J Company creates a multi-layered accountability system that leverages government authority and external verification. In governance terms, such arrangements strengthen monitoring and reduce information asymmetry through the involvement of multiple actors in key decision and approval processes (Jensen & Meckling, 1976). At the same time, this approach reflects a complementary use of formal control and relational coordination, which is particularly important in PPP projects characterized by long-term interaction and institutional complexity (Zwikael & Smyrk, 2014). However, this mechanism also involves trade-offs: excessive intervention by public authorities may reduce managerial flexibility and slow decision-making. Its effectiveness therefore depends on maintaining an appropriate balance between control and operational autonomy.

The debt service reserve fund emerges as an innovative financial solution to the persistent challenge of government payment delays in PPP projects. By requiring contractors to prefund potential repayment obligations through substantial cash reserves (10–20% of project value), J Company creates a robust financial buffer against fiscal uncertainties while maintaining project bankability. This mechanism represents a significant advancement in managing payment risk in emerging markets. The fund's graduated release mechanism, tied to consecutive successful government payments, creates powerful incentives for all parties to maintain performance standards. The structure cleverly transforms what would traditionally be investor-borne financing risk into a shared responsibility, while the return of reserves upon successful project execution ensures contractor commitment to timely completion and quality standards.

These four lessons collectively demonstrate how financial investors can proactively design PPP governance structures to better serve their interests while maintaining balanced partnerships. The approaches range from financial mechanisms (profit-sharing and reserve funds) to stakeholder engagement (joint oversight and contractor equity requirements). The success of these methods suggests they merit consideration for adaptation across different regulatory environments and project types.

4. Discussion

J Company's optimized PIMM plan demonstrates several notable strengths that reflect sophisticated and effective PPP governance. The comprehensive risk allocation and sharing system among the financial investor, industrial investor (EPC contractor), and government, showcases an advanced understanding of PPP risk management principles as outlined by the United Nations (2008). This systematic approach effectively distributes construction risks to contractors while creatively sharing operational risks with government partners. The framework's emphasis upon accountability architecture, contributes to a relatively robust governance structure that helps mitigate opportunistic behaviors by key stakeholders. Particularly innovative are the profit-sharing and debt service reserve mechanisms, which creatively align investor-contractor interests while providing financial safeguards, an approach effective for long-term partnership management.

Despite these strengths, the framework reveals several gaps that warrant attention. Most notably, while the system includes extensive contractual safeguards, it lacks formal trust-building measures that are crucial for relational governance in long-term partnerships. Second, the absence of structured channels for public engagement represents another significant gap, particularly for projects with community impacts, as there are no established mechanisms for community input on project design or service standards. Third, the framework's limited coverage of output specifications and flexibility provisions reflects financial investors' traditional late-stage entry in PPP development – a structural constraint that necessitates either earlier involvement or more rigorous ex-ante assessment during investment decisions.

The analysis of the case governance plan proves the proposed theoretical model can accommodate almost all the governance practices. All key practices represent 14 of these elements in the model. However, noteworthy is the detailed governance structure of the SPV (see Figure 5), which includes ≥67% equity control, supermajority board voting requirements combined with government veto rights, and integrated leadership roles, – an element that is conspicuously absent from the proposed PPP governance model. The analysis proposes expanding the model by incorporating governance structure as an additional organizational element, resulting in a more comprehensive framework comprising 19 distinct governance elements.

The empirical validation of the governance model through J Company's practices reveals important theoretical insights about financial investor governance in PPPs. While the strong alignment confirms the model's robustness, the missing elements, particularly those related to public participation and contractual flexibility, highlight contextual limitations in financial investors' typical governance scope. This partial mapping suggests that financial investors prioritize control-oriented mechanisms (e.g., risk allocation, board governance) over relational or adaptive elements, reflecting their distinct risk-return calculus compared to industrial partners or governments. The findings thus support a contingency perspective on PPP governance: rather than a one-size-fits-all model, effective governance frameworks must account for stakeholder-specific priorities and constraints.

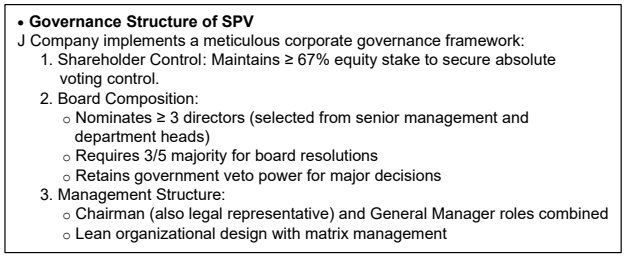

Figure 5. SPV governance structure practices in J Company's PIMM plan (source: J Company's PIMM plan)

Notably, the analysis reveals a potential governance paradox: certain control-intensive practices (e.g., J Company department heads occupying key SPV positions) may constitute excessive oversight that could undermine partnership viability. While these measures address financial investors' legitimate concerns, they risk creating stakeholder asymmetries that may: 1) provoke defensive reactions from other partners, 2) diminish the collaborative advantages fundamental to PPP success, and 3) ultimately compromise project outcomes. More broadly, this tension reflects a deeper trade-off between a control–oriented governance logic–centered on risk mitigation and investor protection and the broader objectives emphasized in PPP governance literature, including public value creation, affordability and value-for-money, service outcomes, legitimacy, and relational partnering. By adopting a financial investor-centric perspective, this study intentionally foregrounds governance mechanisms that enhance control, accountability, and risk allocation under conditions of limited operational influence. This focus enables a more granular understanding of governance challenges that are often underrepresented in conventional PPP frameworks. However, such a perspective also involves analytical narrowing. In particular, the limited treatment of affordability considerations and the streamlining of institutional governance into compliance-oriented mechanisms may underrepresent governance dimensions related to public interest and long-term service performance. Therefore, the findings of this study should be interpreted as complementary to, rather than a substitute for, broader PPP governance frameworks. This suggests financial investors should balance control needs with partnership sustainability, as over-governance may be as detrimental as under-governance.

It is also noted that the theoretical model adopted in this study is designed to encompass the entire lifecycle of a PPP project, covering the phases of development, realization, operation, and transfer (see Figure 2). However, the PIMM plan developed by J Company is primarily focused on the construction phase (i.e., the realization stage). The partial alignment may be attributable to the varying levels and types of risk encountered at different stages of the project lifecycle, which act as moderating factors influencing governance priorities (see Figure 2). During the construction phase, the relationship between the SPV and the EPC contractors becomes particularly salient. Given the elevated risk of construction cost overruns and schedule delays, financial investors may prioritize governance mechanisms that emphasize control and risk mitigation. In contrast, during the longer-term operation phase, financial investors are more likely to shift their attention toward relational and contextual aspects of governance, such as trust-building, performance monitoring, and adaptive management strategies. Therefore, the absence of certain governance practices in the PIMM plan should not be interpreted as a rejection of these governance elements (i.e., Trust, Public participation, Easy specification and measurability, and Flexibility). Rather, it reflects a strategic prioritization tailored to the risk profile and relational dynamics of the construction stage. This observation underscores the need for further empirical research to explore the extent to which the theoretical governance framework aligns with governance practices across the full lifecycle of PPP projects, particularly in the development, operation, and transfer phases.

It is important to interpret the findings of this study in light of their institutional context and associated boundary conditions. The focal case is situated in a developing country context characterized by evolving PPP regulatory frameworks and relatively strong state involvement. As such, the applicability of these mechanisms is inherently context-contingent. This study does not aim to establish universal prescriptions or to definitively distinguish which mechanisms are generalisable across contexts. Rather, it provides an empirically grounded set of governance practices that may be interpreted as context-specific "best practices" emerging from PPP implementation in a developing country setting. The findings should therefore be understood as offering transferable insights rather than directly transferable solutions. Their relevance depends on the degree of alignment between local institutional conditions and those observed in the case, requiring contextual judgment when assessing applicability.

5. Conclusions

This study provides a novel and systematic exploration of governance challenges confronting financial investors in PPP projects, combining theoretical modeling with empirical validation based on J Company's practical innovations. Through this dual-trajectory approach, several critical insights emerge that enrich both academic discourse and practical governance strategies.

First, this study makes an incremental but non-trivial contribution to the PPP governance literature by shifting the analytical lens from the conventional government- or sponsor-centric perspective to that of financial investors. Existing PPP governance element models predominantly conceptualize governance arrangements from the standpoint of public authorities or industrial sponsors, implicitly assuming aligned incentives and relatively homogeneous governance capabilities. However, financial investors, who have become increasingly prominent in PPP markets, face fundamentally different governance challenges, particularly during the construction stage where

they lack direct control over delivery yet bear significant financial exposure. By introducing a governance element framework tailored to financial investors, this study not only fills a notable gap in the literature but also reveals that PPP governance should be understood not merely as project governance, but as a hybrid of project governance and corporate governance. Given the long lifecycle and quasi-corporate nature of SPVs, governance effectiveness depends on mechanisms that align both project-level incentives and firm-level control structures. This perspective extends existing models (e.g., Xiong et al., 2019) which largely overlook the corporate governance dimension embedded in PPP arrangements.

Second, the case study of J Company substantiates the theoretical model while also revealing practice-driven enhancements. Specifically, the case firm's governance innovations, including contractor profit-sharing, integrated risk-transfer mechanisms, joint oversight systems, and the establishment of debt service reserve funds, demonstrate feasible pathways to mitigate financial investors' risk exposure and assert greater operational influence. These mechanisms are especially effective in rebalancing incentive structures, enhancing transparency, and managing fiscal risks in environments with weak institutional guarantees. The strong alignment between theory and practice reinforces the model's practical relevance, while also suggesting refinements, such as the inclusion of SPV governance structure as a formal component of organizational governance.

Third, the study surfaces a nuanced governance paradox: while increased control mechanisms strengthen investor protection, excessive oversight, such as unilateral decision-making or deep managerial embedding, may inadvertently undermine cooperative dynamics essential to PPP success. This tension underscores the importance of striking a strategic balance between financial control and partnership viability. Accordingly, governance frameworks must remain context-sensitive and stakeholder-specific, recognizing that financial investors may prioritize different dimensions of governance depending on their lifecycle involvement and project risk profile.

Theoretically, this study advances PPP governance research by explicitly incorporating the financial investor perspective and by conceptualizing PPP governance as a dual-layer system combining project governance and corporate governance. From a managerial and policy perspective, the findings suggest that effective PPP governance, especially under increasing participation of financial investors, requires institutional arrangements that go beyond traditional contractual structuring and risk-sharing approaches. Mechanisms such as equity participation, profit rebalancing, and contractual safeguards should be designed to ensure incentive compatibility across actors with heterogeneous capabilities and objectives. For policymakers in developing PPP markets, the case further indicates that adaptive, context-sensitive governance innovations can serve as practical solutions to institutional constraints, while also offering transferable insights for similar environments.

Nonetheless, the study has certain limitations. The reliance on a single-case design restricts the generalizability of findings, particularly across diverse PPP sectors and governance regimes. Moreover, the focus on government-payment models may limit applicability to user-pay or blended-finance PPPs. Finally, the governance practices evaluated primarily pertain to the construction phase, leaving the model's validity across the development, operation and transfer stages to be further explored.

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Author contributions

CC and BC conceived the study. CC designed the research, while BC collected the data. CC analyzed data, interpreted the findings and drafted the initial manuscript. All authors reviewed and approved the final version of the article.

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References

Aas, C. T., & Bekker, M. C. (2014). Project governance: Definition and framework. *Procedia - Social and Behavioral Sciences*, *119*, 939–948. https://doi.org/10.1016/j.sbspro.2014.03.105

Cui, Z., Loch, C., Grossmann, B., & He, R. (2012). How provider selection and management contribute to successful innovation outsourcing: An empirical study at Siemens. *Production and Operations Management*, *21*(1), 29–48. https://doi.org/10.1111/j.1937-5956.2011.01237.x

Darko, D., Zhu, D., Quayson, M., Hossin, M., Omoruyi, O., & Bediako, A. (2023). A multicriteria decision framework for governance of PPP projects towards sustainable development. *Socio-Economic Planning Sciences*, *87*, Article 101580. https://doi.org/10.1016/j.seps.2023.101580

Das, T. K., & Teng, B.-S. (2001). Trust, control, and risk in strategic alliances: An integrated framework. *Organization Studies*, *22*(2), 251–283. https://doi.org/10.1177/0170840601222004

du Plessis, J. J., McConvill, J., & Bagaric, M. (2005). *Corporate governance*: *A global perspective*. Thomson Reuters.

Emerson, K., & Nabatchi, T. (2015). Evaluating the productivity of collaborative governance regimes: A performance matrix. *Public Performance & Management Review*, *38*(4), 553–578. https://doi.org/10.1080/15309576.2015.1031016

Engel, E., Fischer, R., & Galetovic, A. (2013). The basic public finance of public-private partnerships. *Journal of the European Economic Association*, *11*(1), 83–111. https://doi.org/10.1111/j.1542-4774.2012.01105.x

Gatti, S. (2013). *Project finance in theory and practice*: *Designing*, *structuring*, *and financing private and public projects*. Academic Press.

Grossman, S. J., & Hart, O. D. (1986). The costs and benefits of ownership: A theory of vertical and lateral integration. *Journal of Political Economy*, *94*(4), 691–719. https://doi.org/10.1086/261404

Ho, S., Levitt, R., Tsui, C.-W., & Hsu, Y. (2015). Opportunism-focused transaction cost analysis of public-private partnerships. *Journal of Management in Engineering*, *31*(6), Article 04015007. https://doi.org/10.1061/(ASCE)ME.1943-5479.0000361

Hueskes, M., Verhoest, K., & Block, T. (2017). Governing public-private partnerships for sustainability: An analysis of procurement and governance practices of PPP infrastructure projects. *International Journal of Project Management*, *35*(6), 1184–1195. https://doi.org/10.1016/j.ijproman.2017.02.020

Inderst, G. (2011). Infrastructure as asset class. *EIB Papers*, *15*(1), 70–105.

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics*, *3*(4), 305–360. https://doi.org/10.1016/0304-405X(76)90026-X

Johnston, J., & Gudergan, S. (2007). Governance of public-private partnerships: Lessons learnt from an Australian case? *International Review of Administrative Sciences*, *73*(4), 569–582. https://doi.org/10.1177/0020852307083459

Kwofie, T. E., Ellis, F. Y. A., & Opoku, D. (2021). Significant governance factors in PPP infrastructure delivery performance in Ghana. *Journal of Public Procurement*, *21*(2), 97–118. https://doi.org/10.1108/JOPP-07-2019-0039

Levitt, R., & Eriksson, K. (2016). Developing a governance model for PPP infrastructure service delivery based on lessons from Eastern Australia. *Journal of Organization Design*, *5*, Article 7. https://doi.org/10.1186/s41469-016-0009-3

Lewis, M., Welsh, M., Dehler, G., & Green, S. (2002). Product development tensions: Exploring contrasting styles of project management. *Academy of Management Journal*, *45*(3), 546–564. https://doi.org/10.2307/3069380

Liu, J., Liu, J., & Ruan, L. (2020). Revenue structure of the dual-role as investor-contractors in PPP project. *Nankai Business Review International*, *11*(2), 283–298. https://doi.org/10.1108/NBRI-08-2019-0043

Organisation for Economic Co-operation and Development. (2004). *OECD principles of corporate governance*.

Park, C., Jung, W., & Han, S. H. (2020). Risk perception gaps between construction investors and financial investors of international public-private partnership (PPP) projects. *Sustainability*, *12*(21), Article 9003. https://doi.org/10.3390/su12219003

Project Management Institute. (2017). *A guide to the project management body of knowledge* (*PMBOK® guide*) (6th ed.).

Renz, P. S. (2007). *Project governance*: *Implementing corporate governance and business ethics in nonprofit organizations*. Physica-Verlag. https://doi.org/10.1007/978-3-7908-1926-6

Rolstadas, A., Tommelein, I., Schiefloe, P., & Ballard, G. (2014). Understanding project success through analysis of project management approach. *International Journal of Managing Projects in Business*, *7*(4), 638–660. https://doi.org/10.1108/IJMPB-09-2013-0048

Samset, K., & Volden, G. (2015). Front-end definition of projects: Ten paradoxes and some reflections regarding project management and project governance. *International Journal of Project Management*, *34*(2), 297–313. https://doi.org/10.1016/j.ijproman.2015.01.014

United Nations Economic Commission for Europe. (2008). *Guidebook on promoting good governance in public-private partnerships*. United Nations.

Wilson, D., Pelham, N., & Duffield, C. (2010). A review of Australian PPP governance structures. *Journal of Financial Management of Property and Construction*, *15*(3), 198–215. https://doi.org/10.1108/13664381011087470

Xiong, W., Chen, B., & Wang, H. (2019). Governing Public–Private Partnerships: A systematic review of case study literature. *Australian Journal of Public Administration*, *78*(1), 95–112. https://doi.org/10.1111/1467-8500.12343

Yescombe, E. R. (2011). *Public-private partnerships*: *Principles of policy and finance*. Butterworth-Heinemann.

Yin, R. K. (2018). *Case study research and applications*: *Design and methods* (6th ed.). Sage.

Zhang, S., Gao, Y., Feng, Z., & Sun, W. (2015). PPP application in infrastructure development in China: Institutional analysis and implications. *International Journal of Project Management*, *33*(3), 497–509. https://doi.org/10.1016/j.ijproman.2014.06.006

Zwikael, O., & Smyrk, J. (2011). *Project management for the creation of organisational value*. Springer. https://doi.org/10.1007/978-1-84996-516-3

Zwikael, O., & Smyrk, J. (2014). Project governance: Balancing control and trust in dealing with risk. *International Journal of Project Management*, *33*(4), 852–862. https://doi.org/10.1016/j.ijproman.2014.10.012