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Mobilizing private investment for road transport in public–private partnership: A study of influencing factors in Vietnam

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ABSTRACT

This study investigates the factors influencing private sector engagement in public–private partnerships (PPPs) in Vietnam's road transport infrastructure sector. The study employs a mixed-method approach, involving qualitative interviews with nine experts and a survey of 200 stakeholders, including government officials, financial institutions, private firms, and academic professionals. Cronbach's Alpha, exploratory factor analysis, confirmatory factor analysis, and the relative importance index were applied to test and rank the importance of factors. The findings show that a stable socio-economic environment, firm political commitment, and a transparent legal framework are essential for successfully attracting private investment. Institutional capacity, effective risk-sharing mechanisms, and facilitative policy incentives also significantly influence private sector decisions. Private sector financial availability and access to adequate capital were also highlighted as key factors. Additionally, active supervision, stakeholder feedback mechanisms, and community engagement significantly enhance project effectiveness and encourage social acceptance. This study offers meaningful insights for evidence-based strategies that can be used to build conducive and attractive PPP investment environments in Vietnam's road transport infrastructure sector.

Contribution/ Originality: This research addresses the practical and theoretical gaps in PPP projects for road infrastructure in Vietnam by exploring key socio-economic, organizational, responsibility, and risk allocation factors, as well as community engagement – an area overlooked in previous research in Vietnam – that influences private sector participation.

1. INTRODUCTION

The development of road infrastructure is critical in driving economic growth and improving social activities (Ng, Law, Jakarni, & Kulanthayan, 2019; Timilsina, Stern, & Das, 2024). Effective transportation networks facilitate trade, enhance connectivity, and stimulate regional development (Li, Song, Xia, & Fu, 2023). Nevertheless, the significant costs involved in constructing and maintaining roads pose considerable challenges, particularly for governments in developing countries like Vietnam (Nguyen, Nguyen, Doan, & Dang, 2023; Vu & Pham-Nguyen, 2024). Governments have traditionally relied heavily on public funding for infrastructure projects; however, the demand for expanded and modernized infrastructure has begun to outstrip available public budgets (Adetoro, Kululanga, Mkandawire, & Musonda, 2024). As a result, mobilizing private-sector investment has become increasingly vital to closing the infrastructure funding gap (Meng, Ye, & Wang, 2024). In particular, public–private partnerships (PPP) have emerged as a viable strategy to attract private capital and expertise to infrastructure development (Cheng, Zhu, Wang, & Ke, 2024; Liu, Clegg, & Pollack, 2023). PPP arrangements also strategically

distribute certain risks to private stakeholders for greater cost-effectiveness (Liu, Clegg, & Pollack, 2022; Liu et al., 2023). By harnessing private-sector experience, innovation, and economies of scale, PPP initiatives have the potential to deliver infrastructure projects and associated services at a reduced cost, all while maintaining essential governmental oversight (Jiang, Yang, Jiang, Martek, & Gao, 2022; Nizkorodov, 2021). Notwithstanding the importance of these initiatives, empirical findings on attracting PPP have been mixed (Ali, Irfan, & Salman, 2020; Fabre & Straub, 2023); further research to better understand these problems, particularly in emerging countries, is thus vital.

Effective institutions and financial policies play a crucial role in mobilizing investment capital for road infrastructure projects. The institutional environment encompasses regulatory frameworks, government policies, and broader investment conditions that directly influence private-sector participation in infrastructure development (Gupta & Sharma, 2023; Phung, Van, Thuong, & Ha, 2019). Gupta and Sharma (2023) highlight comprehensive institutional frameworks and clear policy structures as key drivers of successful PPP investments. The experiences of countries like the United Kingdom, Denmark, and the Netherlands show that transparent institutional frameworks and robust financial policies significantly enhance the attractiveness of investment in road infrastructure for private entities (Inderst, 2017; Ruiz-Nuñez & Wei, 2015).

In Vietnam, Law No. 64/2020/QH14 on PPP investment establishes a transparent legal foundation to expedite public investment disbursements and optimize the efficient use of public and private capital in infrastructure projects.[1] This law outlines various types of PPP contracts, including BOT (build-operate-transfer), BTO (build-transfer-operate), BOO (build-own-operate), O&M (operate and manage), BTL (build-transfer-lease), BLT (build-lease-transfer), and hybrid models. Vietnam successfully implemented 222 PPP projects within the transportation sector by 2021, totaling an investment of approximately USD 27 billion (VND 689,026 billion). Among these, BOT contracts were the most common, accounting for 95.5% of the projects; BOO and BTL contracts accounted for 3.5% and 1%, respectively (Dung, Dung, & Hai, 2024). However, since 2021, this trend has significantly declined, with only 31 PPP projects implemented and an additional 11 projects under review. This slowdown is primarily the result of inadequacies in existing PPP policies and mechanisms, which frequently fail to achieve an equitable balance of stakeholder interests, diminishing the attractiveness of projects for investors and financial institutions.[2] Moreover, most PPP investments have been in the electricity sector, with few projects focused on critical infrastructure like roads and ports despite their importance for economic growth.[3] This uneven allocation underscores the challenges faced by road infrastructure projects in attracting private investment and the need for more balanced policies for infrastructure development.

The literature highlights ongoing debates concerning the factors critical to attracting investment and the success of PPP projects. There have been extensive studies on PPP applications in transport infrastructure with various objectives, methodologies, and theoretical and practical perspectives. The elements identified as crucial for successful PPP initiatives include transparent legal frameworks, collaboration with skilled stakeholders, fair benefit distribution, economic stability, supportive incentive policies, and effective risk allocation (Almeile, Chipulu, Ojiako, Vahidi, & Marshall, 2024; Helmy, Khourshed, Wahba, & Bary, 2020; Kopańska, Osinski, & Korbus, 2024; Navalersuph & Charoenngam, 2021; Nizkorodov, 2021). The relevance and effectiveness of these factors can differ significantly depending on a country's unique economic, political, and social circumstances. This makes it challenging (and ineffective) to apply the recommendations and findings of previous studies in a principled manner to the Vietnamese context.

There is also a notable gap in the literature for Vietnam, and most studies have addressed factors such as project benefits, stakeholder commitment, risk sharing, transparency in project execution, procurement procedures, and sound economic policies as critical determinants of PPP project success (Hai, Toan, & Van Tam, 2021; Nguyen et al., 2023). While international research points to the significance of social acceptance and community engagement (Ahmadabadi & Heravi, 2019; Rouhani, Geddes, Gao, & Bel, 2016), there is insufficient evidence of how local

communities perceive and contribute to infrastructure projects in Vietnam. This understanding is imperative for formulating policies that effectively balance investor interests with public needs. As such, bridging the existing gap in empirical research concerning community participation within Vietnam's unique socio-economic and regulatory framework remains a critical priority.

This research addresses the practical and theoretical gaps in PPP projects for road infrastructure in Vietnam by exploring key socio-economic, organizational, responsibility, and risk allocation factors influencing private-sector participation. It also investigates community engagement – an area overlooked in previous research in Vietnam – to understand its impact on project success and social acceptance. The study aims to establish clear and relevant criteria for evaluating the effectiveness of PPP projects in the road infrastructure sector. The study combines an extensive literature review with robust quantitative methodologies, including Cronbach's Alpha reliability testing, exploratory factor analysis (EFA), confirmatory factor analysis (CFA), and the relative importance index (RII), to identify and analyze the factors critical for the success of PPP projects in transportation infrastructure. By providing empirical evidence and context-specific recommendations, the research contributes toward a more balanced and sustainable PPP investment framework in Vietnam. The outcomes of this study are intended to inform strategies that effectively balance risks and ensure financial sustainability and a favorable investment environment for road infrastructure projects in Vietnam. The remainder of the paper is structured as follows. Section 2 presents the literature review and research hypotheses. Section 3 sets out the research methodology and data. Section 4 contains the results and a discussion of these, and in Section 5, the study's conclusions and implications are presented.

2. LITERATURE REVIEW AND RESEARCH HYPOTHESES

2.1. Public–Private Partnership Concepts

PPP is a collaborative investment approach that leverages public-sector oversight alongside private-sector expertise and financial resources to effectively develop, finance, and manage infrastructure projects (Liu et al., 2023; Verweij & van Meerkerk, 2021). Specifically, PPP arrangements in the transportation infrastructure sector facilitate the sharing of responsibilities, risks, and benefits between government and private investors (Liu et al., 2022, 2023; Moyo & Chigara, 2023; Nguyen et al., 2023). Law No. 64/2020/QH14 on PPP Investment outlines the regulatory foundation for these initiatives in Vietnam. This law contains comprehensive guidelines for implementing infrastructure projects and delineates various contract forms, including BOT, BTO, BOO, O&M, BTL, and BLT, as well as hybrid models. Each contract specifies clear obligations for public and private partners, covering such aspects as investment contributions, project management responsibilities, revenue-sharing arrangements, and dispute-resolution mechanisms. According to Law No. 64/2020/QH14, PPP projects are typically implemented following a structured sequence, beginning with project identification and feasibility studies, followed by competitive bidding, contract negotiations, construction, operational management, and, upon completion, the project's transfer to public ownership. Government authorities ensure regulatory compliance through each phase, while private-sector partners contribute their expertise to guarantee efficient project delivery and effective operations management (Helmy et al., 2020).

One of the key advantages of PPPs is that they reduce the financial pressure on governments; private entities assume responsibilities related to financing, construction, and operational management (Ismail, 2013; Jiang et al., 2022). PPP projects also capitalize on the private sector's expertise in project management, advanced technologies, and innovative practices, enhancing service delivery and cost management while ensuring timely completion (Cao, Li, Su, Zhang, & Zhang, 2024; Nizkorodov, 2021). Additionally, PPP contracts often incorporate risk-sharing mechanisms, motivating private partners to maintain efficiency and accountability throughout the project lifecycle (Cao et al., 2024; Liu et al., 2023).

Despite these benefits, the PPP model introduces several challenges. Complex contractual arrangements frequently result in prolonged negotiations, higher transaction costs, and stakeholder conflicts (Kopańska et al., 2024;

Vecchi, Cusumano, Casady, Gatti, & Borgonovo, 2022). Furthermore, inconsistent risk allocation, inadequate project planning, and Vietnam's limited institutional capacity pose substantial hurdles to effective implementation (Nguyen, Likhitruangsilp, & Onishi, 2020). Other potential barriers to successful PPP execution include an incomplete legal framework, difficulties ensuring transparency, and an uneven distribution of project benefits (Adetoro et al., 2024; Ibrahim & Jantan, 2024; Nguyen et al., 2023). These obstacles underscore the necessity for strengthened institutional frameworks, clear policy guidelines, and robust risk management strategies to foster sustainable PPP investments in Vietnam's transportation infrastructure sector. Consequently, gaining a deeper understanding of critical success factors will offer valuable insights to policymakers and practitioners, enabling them to improve efficiency, transparency, and sustainability in future PPP initiatives.

2.2. Literature Review and Hypothesis Development

The socio-economic environment (SE) has received considerable attention in the literature as a crucial factor for the success of PPP projects. Also critical to this success is a stable socio-economic environment (SE1), which provides predictable investment conditions and reduces financial uncertainty (Amović, Maksimović, & Bunčić, 2020; Kopańska et al., 2024). Several studies offer consistent evidence that macroeconomic stability – characterized by controlled inflation, stable interest rates, and sustained economic growth – is fundamental to creating an attractive investment climate (Jiang et al., 2022; Osei-Kyei & Chan, 2017). For instance, Osei-Kyei and Chan (2016) identified macroeconomic stability as essential for the success of three PPP projects for primary transport in Sub-Saharan Africa. Similarly, a robust institutional framework with transparent processes (SE2), well-defined party responsibilities (SE3), and effective social communication (SE4) significantly mitigates corruption risks and enhances overall project management efficiency.

In a study in Bosnia and Herzegovina that has implications for other transitional economies, Amović et al. (2020) employ principal component analysis and the Varimax method to show that transparency and standardized procedures were critical factors for successful PPP investments. Apparent adherence to the responsibilities stipulated in PPP contracts reinforces investor confidence, guarantees regulatory consistency, and promotes effective project execution (Moyo & Chigara, 2023; Nguyen et al., 2023). In addition, effective social communication fosters stakeholder engagement and public acceptance, significantly contributing to project sustainability (Kukah, Owusu-Manu, Badu, & Edwards, 2024). Supporting this, Hai et al. (2021) use a mixed-method approach combining stakeholder interviews with statistical analyses to identify transparent procurement, accessibility of project information, public acceptance, and economic stability as socio-economic factors that are essential for successful PPP transportation projects in Vietnam. These findings underline that the socio-economic environment is key to successful PPP implementation, informing the formulation of the first research hypothesis:

Hypothesis 1: The stable socio-economic environment (SE) is a significant factor in road infrastructure PPP projects.

Second, the roles and responsibilities of the state (RR) significantly influence the success of PPP projects, especially those for the development of transport infrastructure. Effective government participation promotes an environment that is conducive to investment, reduces project risks, and facilitates efficiency in project implementation (Cheng et al., 2024; Rohman, 2022). A central aspect of this government participation is political determination (RR1), reflecting the government's commitment to actively supporting PPP initiatives. For example, Chan Albert, Lam Patrick, Chan Daniel, Cheung, and Ke (2010) identified public sector commitment as essential for success in a survey of 87 PPP experts from China and Hong Kong. Likewise, Amović et al. (2020) and Osei-Kyei and Chan (2017) emphasized that strong political commitment enhances project execution by minimizing uncertainty and bolstering investor confidence. Such commitment clearly signals that the government intends to uphold contractual obligations and maintain stability throughout implementation. Establishing a complete, stable, and unified economic policy (RR2) reinforces investor confidence and ensures project viability.

Babatunde, Ekundayo, Udeaja, and Abubakar (2020) showed that inconsistent policies and an uncertain investment climate increase risk, deterring private-sector involvement in long-term infrastructure projects. A clear and transparent legal framework (RR3) is also essential for promoting fair competition, reducing corruption risks, and protecting stakeholder interests. Özcan (2025) and Helmy et al. (2020) demonstrate that a transparent legal system enhances project feasibility, facilitates the effective enforcement of contracts, and encourages accountability throughout the project lifecycle. Conversely, fragmented or unclear legal structures often result in project delays, cost overruns, and disputes. Also essential to PPP success is effective government support (RR4), which includes regulatory facilitation, risk mitigation strategies, and technical assistance. Dulaimi, Alhashemi, Ling, and Kumaraswamy (2010) found that in developing economies, active government support, including guarantees and capacity-building initiatives, markedly improves PPP outcomes. Such assistance enhances investor confidence and ensures that projects align closely with national infrastructure objectives. Collectively, these elements highlight the vital role of government involvement in fostering conditions favorable for successful PPP implementation, laying the foundation for the second research hypothesis.

Hypothesis 2: The roles and responsibilities of the state (RR) are significant factors in road infrastructure PPP projects.

Third, the organization of the state apparatus and the capacity of officers (OC) significantly influence the successful implementation of PPP projects because they facilitate effective project management, risk mitigation, and sustainable outcomes (Heerma van Voss & Helsloot, 2023; Helmy et al., 2020). Crucially, state agencies with responsibility, capacity, and experience (OC1) have been identified as fundamental to success, particularly in Islamic countries (Özcan, 2025). Well-structured agencies with sufficient institutional capacity play an essential role in aligning project objectives with national development plans and ensuring regulatory compliance (Bahadorestani, Naderpajouh, & Sadiq, 2020). Given the inherent complexity of PPP projects – including intricate financial arrangements, comprehensive legal frameworks, and detailed risk-sharing provisions – specialized expertise is vital. The knowledge of relevant staff and civil servants (OC2) must be aligned with project demands. In their study in India, Sehgal and Dubey (2019) emphasized the critical importance of managerial expertise and effective project administration for successful PPP outcomes. Skills in policy planning and implementation (OC3) are similarly indispensable. Ismail (2013) identified good governance and mutual commitment from the public and private sectors as pivotal for PPP success in Malaysia. Positive attitudes of staff and civil servants (OC4) also significantly contribute to project success. Nguyen, Le Thu, Thach, and Pham Diem (2022) demonstrated that motivated and dedicated civil servants address project challenges promptly, ensuring that milestones are achieved in a timely fashion. Osei-Kyei and Chan (2015) emphasized that robust political backing and the competence of personnel substantially influence project outcomes. These findings underline that the organization and capacity of state institutions – characterized by skilled, knowledgeable, and committed personnel – are essential for successfully delivering and sustaining PPP projects. The third hypothesis is as follows.

Hypothesis 3: The organisation of state apparatus and officer's capacity (OC) is a significant factor in road infrastructure PPP projects.

Fourth, recent studies highlight that preferential policies and effective risk allocation (IR) are needed to attract private investment and achieve successful PPP project outcomes. Fully analyzing project investment cash flow (IR1) is essential to prioritizing infrastructure projects, aligning with the project finance approach that is widely endorsed in infrastructure development (Demirel, Leendertse, & Volker, 2022; Liu et al., 2023). PPP projects are typically selected based on their clear economic benefits compared to conventional public procurement methods, ensuring the advantages justify the associated costs (Helmy et al., 2020). Mechanisms that attract and encourage investment while creating favorable conditions for private investors (IR2) also impact PPP success. Studies have emphasized the importance of supportive legal frameworks and investment environments for bolstering investor confidence, as demonstrated by research into factors that are critical for the success of PPP infrastructure projects in Taiwan (Hsueh & Chang, 2017).

Compliance with international principles and signed agreements (IR3) also promotes global investment participation through mutually beneficial partnerships (Hai et al., 2021; Ismail, 2013). Appropriate forms of support for investors (IR4), including performance-based incentives and structured risk-sharing arrangements, make projects more attractive and mitigate uncertainties for private stakeholders (Kukah et al., 2024; Nguyen et al., 2023). Establishing comprehensive regulations for equality between state and private partners (IR5) builds mutual trust and accountability and offers clear guidance for project procurement, reinforcing stakeholder confidence (Amović et al., 2020; Zhao, Ma, & Bu, 2020). Transparency and openness in project implementation (IR6) are also critical for ensuring the expected outcomes, high-quality services, and adherence to established standards and codes of conduct (Helmy et al., 2020; Sheppard & Beck, 2023). An available financial market (IR7) and an appropriate exchange rate (IR8) facilitate efficient financing and mitigate currency-related risks (Helmy et al., 2020). Lastly, adhering to international practices for dispute resolution (IR9) ensures fair and efficient conflict management and the safeguarding of stakeholder interests throughout the project lifecycle (Okudan & Çevikbaş, 2022). Hence, the fourth hypothesis of this study is as follows.

Hypothesis 4: Preferential policies and effective risk allocation (IR) are significant factors in road infrastructure PPP projects.

Fifth, the capacity and level of development of private partners (DC) significantly influence the success of PPP projects. The effectiveness of private partners is heavily dependent on their financial resources to meet investment project requirements (DC1). Existing studies have consistently highlighted the importance of financially robust private entities for project sustainability and effectiveness (Liu et al., 2023; Shi, Chong, Liu, & Ye, 2016). Furthermore, the availability and accessibility of capital from financial institutions (DC2) enhance private-sector engagement. Kukah et al. (2024) for example, emphasized that financial guarantees and ease of securing debt financing facilitate active private participation in PPP initiatives. Effective resource management (DC3) remains essential for PPP success. Helmy et al. (2020) highlighted managerial expertise and operational competence as indispensable for project continuity and efficiency. These findings show that private partners with robust financial foundations, reliable capital access, and proficient resource management capabilities considerably improve the outcomes and sustainability of PPP projects, laying the foundation for the fifth hypothesis.

Hypothesis 5: The capacity and level of development of private partners (DC) is a significant factor in road infrastructure PPP projects.

Finally, social participation (SP) emerges as essential for the success of PPP projects by ensuring that community needs and concerns are addressed and that project transparency and accountability are maintained. Osei-Kyei and Chan (2015) suggest that engaging the public from the early stages of project planning can prevent significant delays – particularly those related to land acquisition – and reduce overall costs by encouraging local employment. Social acceptance has become increasingly critical as communities now expect infrastructure projects to deliver high-quality services, be environmentally sustainable, and offer employment opportunities (Helmy et al., 2020). Research has consistently emphasized that a full mechanism for community supervision (*SP1*) significantly enhances project oversight and governance. Such a mechanism allows stakeholders to closely monitor progress, proactively manage potential risks, and prioritize public welfare (Leruth, 2012; Nizkorodov, 2021). Moreover, encouraging community feedback on the quality of road transport infrastructure projects (SP2) strengthens outcomes, as local insights frequently point to practical challenges and community attitudes towards project implementation (Jayasuriya, Zhang, & Yang, 2024). In addition, comprehensive social impact assessment mechanisms (SP3) are needed to evaluate the project's societal implications and mitigate risks by fostering greater community acceptance and ensuring the long-term sustainability of infrastructure projects (Osei-Kyei & Chan, 2015; Shi et al., 2016). Collectively, these findings highlight the value of effective public participation through mechanisms like community supervision, proactive feedback, and thorough impact assessment in improving project implementation, enhancing stakeholder trust, and ultimately achieving sustained project success. Thus, the sixth hypothesis is as follows.

Hypothesis 6: Social participation is a significant factor in road infrastructure PPP projects.

Table 1 summarizes the factors discussed in the theoretical overview, emphasizing their content and implications. The following section provides a method for determining their significance and ranking them in order of importance based on the collected primary data.

Table 1. Proposed factors and criteria of road infrastructure PPP projects.

Factor	Criteria	Explanation	References
Socio-economic environment (SE)	SE1	Stable socio-economic environment	Kukah et al. (2024); Moyo and Chigara (2023); Nguyen et al. (2023); Jiang et al. (2022); Amović et al. (2020) and Osei-Kyei and Chan (2017)
	SE2	Transparent processes	
	SE3	Well-defined responsibilities of the parties	
	SE4	Effective social communication	
Roles and responsibilities of the state (RR)	RR1	Political determination	Özcan (2025); Babatunde et al. (2020); Helmy et al. (2020); Amović et al. (2020) and Osei-Kyei and Chan (2017)
	RR2	Complete, stable, and unified economic policy	
	RR3	Clear and transparent legal framework	
	RR4	Effective government support	
State apparatus' organisation and officer capacity (OC)	OC1	Responsibility, capacity, and experience of state agencies	Özcan (2025); Nguyen et al. (2022); Bahadorestani et al. (2020); Sehgal and Dubey (2019); Osei-Kyei and Chan (2015) and Ismail (2013)
	OC2	Knowledge of relevant staff and civil servants	
	OC3	Essential skills in policy planning and implementation of relevant staff and civil servants	
	OC4	Positive attitude of relevant staff and civil servants	
Preferential policies and effective risk allocation (IR)	IR1	Full analysis of project investment cash flow	Kukah et al. (2024); Nguyen et al. (2023); Liu et al. (2023); Okudan and Çevikbaş (2022); Demirel et al. (2022); Hai et al. (2021); Zhao et al. (2020); Amović et al. (2020); Helmy et al. (2020); Hsueh and Chang (2017) and Ismail (2013)
	IR2	Mechanisms that attract and encourage investment while creating favourable conditions for private investors	
	IR3	Compliance with international principles and agreements	
	IR4	Appropriate forms of support for investors	
	IR5	Comprehensive regulations ensuring equality between state and private partners	
	IR6	Transparency and openness in project implementation	
	IR7	Available financial market	
	IR8	Appropriate exchange rate	
	IR9	Adhering to international practices for dispute resolution	
Capacity and level of development of private partners (DC)	DC1	Financial resources to meet investment requirements	Kukah et al. (2024); Liu et al. (2023); Helmy et al. (2020) and Shi et al. (2016)
	DC2	Access to capital from financial institutions	
	DC3	Effective resource management	
Social participation (SP)	SP1	A full mechanism for community supervision	Jayasuriya et al. (2024); Nizkorodov (2021); Shi et al. (2016); Osei-Kyei and Chan (2015) and Leruth (2012)
	SP2	Encouraging community feedback on the quality of road transport infrastructure projects	
	SP3	Comprehensive mechanism for social-impact assessment	

3. RESEARCH METHOD AND DATA

3.1. Research Method

This study applies qualitative and quantitative methods to identify and evaluate the factors influencing financial institutions in mobilizing investment capital for road transport infrastructure under the PPP model in Vietnam. The qualitative approach involved an initial round of expert interviews to uncover relevant factors based on practical experience and professional insights. This ensured that the research remained grounded in the real-world context of PPP investment challenges and opportunities specific to Vietnam. Based on the qualitative results, several robust statistical techniques are employed in the quantitative analysis, as follows. Cronbach's Alpha is first applied to test reliability and internal consistency among the identified variables (Schmitt, 2011). EFA and CFA are then utilized to validate and group these factors (Hair, Black, Babin, & Anderson, 2010). Finally, the RII is applied to rank the identified criteria (Akadiri, Olomolaiye, & Chinyio, 2013). According to Hair et al. (2010), EFA is useful for

uncovering the structure underlying observed variables and clustering these into coherent factors based on shared variance. This statistical method simplifies complex data by revealing relationships and determining logical groupings. Essential steps include assessing sample adequacy through the Kaiser–Meyer–Olkin (KMO) test, ensuring suitability via Bartlett's test of sphericity, factor extraction based on eigenvalues, and factor rotation to enhance interpretability. CFA was then conducted to confirm that the observed variables accurately reflect the predefined factor structures derived from theoretical expectations. The test assesses the validity and reliability of measurement models by examining how observed indicators relate to their latent constructs. The CFA process has several critical stages: clearly defining the hypothesized factor structure (model specification), confirming the model is statistically identifiable (model identification), and estimating the relationships through maximum likelihood (ML). Finally, the overall model accuracy and fit were evaluated using standard fit indices such as the Chi-square test, comparative fit index (CFI > 0.90), Tucker–Lewis Index (TLI > 0.90), and root mean square error of approximation (RMSEA < 0.08); if the fit is inadequate, modifications may be made based on theoretical justification. Finally, the CFA results were interpreted by confirming significant factor loadings (≥0.5) and assessing composite reliability (CR) and average variance extracted (AVE) to ensure construct consistency and validity.

These methods help ensure that the selected variables are consistent and statistically significant in explaining the conditions affecting the willingness of financial institutions to invest in PPP road infrastructure projects. The significance of each factor was further evaluated by applying the RII, which ranks the identified criteria based on their perceived importance. According to Akadiri et al. (2013), the RII is calculated as follows.

$$RII = \frac{5n_5+4n_4+3n_3+2n_2+1n_1}{5N},$$

Where n_1 to n_5 represent the frequency of responses across a five-point Likert scale, and N is the total number of respondents. The resulting RII value ranges from 0 to 1, with higher values indicating greater importance. This combined approach ensures a comprehensive understanding of the factors affecting investment mobilization and provides a robust basis for policy recommendations aimed at enhancing PPP implementation in Vietnam's road infrastructure sector.

3.2. Data

A literature review and interviews were conducted to design a questionnaire for surveying stakeholders. In addition to the literature review, this process involved interviews with nine officials and civil servants directly engaged in developing, organizing, and implementing financial mobilization mechanisms under the PPP model for road transport infrastructure. The interviewees included representatives from the Ministry of Planning and Investment (PPP Office), Ministry of Transport, Department of Planning and Investment of Ho Chi Minh City, Ho Chi Minh City Department of Transport, Department of Planning and Investment of Hau Giang Province, Department of Transport of Tien Giang Province, Traffic Newspaper, and five officials from relevant banks, including the Bank for Investment and Development of Vietnam, the Bank for Foreign Trade of Vietnam, and the Bank for Industry and Trade.

A questionnaire was developed to collect primary data based on the insights gained from the interviews. The non-random sample of 200 respondents included officials, civil servants, and staff involved in project planning and implementation within financial institutions mobilizing investment capital for road transport infrastructure under the PPP model. The sample also included employees from companies such as Deo Ca Group Joint Stock Company and Phu My Construction Investment Joint Stock Company, along with lecturers specializing in PPP-related research and teaching at Ho Chi Minh City University of Economics and Ho Chi Minh City University of Transport. A total of 200 responses were collected, all of which were deemed valid for analysis.

4. RESULTS AND DISCUSSIONS

4.1. Descriptive Statistics

Primary data were collected through a questionnaire using convenience sampling. A total of 200 questionnaires were distributed, primarily through direct surveys, resulting in 200 valid responses. Within the sample responses, 50% (100 responses) were from officials, civil servants, and public employees, 30% (60 responses) were from government offices, and relevant business and bank employees, and 20% were from university lecturers and researchers working on infrastructure. All respondents had a minimum of three years of work experience. This diverse respondent pool ensured a comprehensive understanding of the factors attracting private-sector participation in PPP projects for road transport infrastructure in Vietnam. The high response rate and consistent data quality ensure the survey is a reliable basis for analyzing investment challenges and opportunities and drawing valuable insights for further analysis.

4.2. Cronbach's Alpha Reliability Test

Cronbach's Alpha tests were conducted to assess the reliability of the collected data and to remove criteria that did not meet the required standards. According to Hair et al. (2010), a scale is considered reliable if the Cronbach's Alpha coefficient exceeds 0.6 and the total correlation coefficient of the variables within the scale is greater than 0.3. Table 2 presents the results of this analysis.

Table 2. Results of Cronbach's alpha reliability test for proposed factors in road infrastructure PPP projects.

Observed variables	Average scale if eliminate variable	Scale variance if eliminate variable	Correlation of total variables	Cronbach's Alpha if eliminate variable
Socio-economic environment (SE): Cronbach's Alpha = 0.836				
SE1	11.0400	10.139	0.700	0.778
SE2	11.1400	10.523	0.694	0.782
SE3	11.1900	9.893	0.684	0.785
SE4	11.2300	10.628	0.594	0.824
Roles and responsibilities of the state (RR): Cronbach's alpha = 0.779				
RR1	11.3400	7.684	0.593	0.721
RR2	11.4100	8.022	0.612	0.710
RR3	11.3800	8.226	0.566	0.733
RR4	11.4000	8.421	0.563	0.735
State apparatus' organisation and officer capacity (OC): Cronbach's alpha = 0.876				
OC1	10.8100	9.716	0.789	0.818
OC2	11.0000	10.050	0.760	0.830
OC3	10.9800	10.382	0.738	0.839
OC4	11.1200	10.247	0.650	0.875
Preferential policies and effective risk allocation (IR): Cronbach's alpha = 0.888				
IR1	28.8400	38.339	0.596	0.881
IR2	28.6800	39.013	0.684	0.872
IR3	29.4900	40.563	0.686	0.874
IR4	29.4100	39.488	0.693	0.872
IR5	29.0000	38.563	0.625	0.877
IR6	29.0300	38.281	0.678	0.873
IR7	29.1300	39.249	0.569	0.882
IR8	29.0300	39.979	0.598	0.879
IR9	29.4500	39.052	0.695	0.872
Capacity and level of development of private partners (DC): Cronbach's alpha = 0.744				
DC1	7.5600	3.313	0.576	0.652
DC2	7.7400	3.261	0.544	0.689
DC3	7.7800	3.130	0.589	0.636
Social participation (PP) Cronbach's alpha = 0.872				
SP1	7.6500	3.949	0.760	0.814
SP2	7.6700	3.802	0.778	0.797
SP3	7.7200	3.971	0.724	0.846

Table 2 shows that the Cronbach's Alpha coefficients for all factor groups exceed the threshold of 0.6, indicating acceptable internal consistency and reliability. The grouping of factors related to the socio-economic environment (SE) achieved a Cronbach's Alpha of 0.836, with individual item-total correlations ranging from 0.594 to 0.700, suggesting that each variable contributes adequately to the overall scale. The roles and responsibilities of the state factor group had a Cronbach's Alpha of 0.779, with item-total correlations between 0.563 and 0.612, showing moderate reliability. The group of factors related to the state apparatus' organization and officer capacity exhibited higher reliability, with a Cronbach's Alpha of 0.876 and item-total correlations from 0.650 to 0.789. The preferential policies and effective risk allocation factor group demonstrated strong reliability, with a Cronbach's Alpha of 0.888 and item-total correlations ranging from 0.569 to 0.695. Similarly, the group of factors related to the capacity of private partners and their development level had a Cronbach's Alpha of 0.744, while the social participation factor group had a Cronbach's Alpha of 0.872. These results confirm that all proposed factor groups meet the standards for reliability, justifying their inclusion in the subsequent EFA.

4.3. Exploratory Factor Analysis

Table 3 presents the results from the KMO test and Bartlett's test of sphericity, which indicate whether the dataset is suitable for EFA. The KMO value of 0.867 demonstrates strong sampling adequacy, indicating that the data have adequate correlations among variables and are thus well-suited for factor analysis. Bartlett's test of sphericity yielded significant results ($p < 0.05$), further confirming that the variables are appropriately correlated. Together, these findings validate the suitability of the dataset for EFA, ensuring reliability in the subsequent factor-extraction process.

Table 3. KMO and bartlett's test for sampling adequacy and sphericity.

KMO and bartlett's test	
Kaiser–Meyer–Olkin measure of sampling adequacy	0.867
Bartlett's test of sphericity	2,492.823
Df	351
Sig.	0.000

Table 4. Total variance explained by extracted factors.

Component	Initial eigenvalues			Extraction sums of squared loadings			Rotation sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	7.729	28.624	28.624	7.729	28.624	28.624	4.875	18.055	18.055
2	2.528	9.364	37.988	2.528	9.364	37.988	2.994	11.090	29.145
3	2.326	8.617	46.605	2.326	8.617	46.605	2.767	10.249	39.394
4	1.789	6.626	53.230	1.789	6.626	53.230	2.452	9.081	48.475
5	1.744	6.460	59.690	1.744	6.460	59.690	2.390	8.851	57.326
6	1.432	5.304	64.994	1.432	5.304	64.994	2.070	7.668	64.994
7	0.805	2.981	67.975						
8	0.774	2.866	70.841						
9	0.666	2.465	73.306						
10	0.618	2.290	75.597						
11	0.595	2.203	77.800						
12	0.564	2.087	79.887						
13	0.525	1.945	81.832						
14	0.508	1.883	83.715						
15	0.468	1.732	85.446						
16	0.447	1.655	87.102						
17	0.440	1.630	88.731						
18	0.422	1.561	90.293						
19	0.403	1.494	91.787						
20	0.375	1.388	93.175						
21	0.359	1.328	94.503						
22	0.320	1.187	95.690						
23	0.304	1.124	96.814						
24	0.264	0.977	97.790						
25	0.246	0.911	98.701						
26	0.186	0.688	99.389						
27	0.165	0.611	100.000						

Table 4 sets out the total variance results as explained through EFA. The analysis identified six components with eigenvalues greater than 1, explaining a cumulative variance of 64.99%. The first component accounts for 18.06% of the variance, followed by the second (11.09%), third (10.25%), fourth (9.08%), fifth (8.85%), and sixth (7.67%) components. These six factors represent the underlying structure of the observed variables defined in Table 1, including the socio-economic environment, roles and responsibilities of the state, state apparatus organization and officer capacity, preferential policies, and effective risk allocation, private partner capacity, and social participation. The cumulative variance indicates that the identified factors sufficiently represent the data structure and support further analysis.

Table 5. EFA results for proposed factors in road infrastructure PPP projects.

	Component					
	1	2	3	4	5	6
IR6	0.758					
IR3	0.748					
IR4	0.746					
IR2	0.713					
IR9	0.711					
IR5	0.684					
IR8	0.683					
IR1	0.660					
IR7	0.640					
OC1		0.833				
OC2		0.829				
OC3		0.799				
OC4		0.770				
SE2			0.818			
SE3			0.814			
SE1			0.812			
SE4			0.734			
SP2				0.853		
SP1				0.850		
SP3				0.838		
RR3					0.773	
RR4					0.757	
RR2					0.733	
RR1					0.649	
DC1						0.785
DC3						0.778
DC2						0.769

Table 5 presents the results of the EFA, showing the factor loadings for the variables defined in Table 1. Six distinct components were identified, with each variable loading strongly onto its respective factor, indicating clear groupings and construct validity. The 'preferential policies and effective risk allocation' factor includes IR1 to *IR9*, with loadings ranging from 0.640 to 0.758, suggesting that investment incentives, risk-sharing mechanisms, and regulatory transparency are key considerations for financial institutions. The 'state apparatus' organization and officer capacity' factor comprises variables *OC1* to *OC4*, with loadings from 0.770 to 0.833, highlighting the importance of staff expertise and institutional capacity. The 'socio-economic environment' factor comprises variables *SE1* to *SE4*, with factor loadings ranging from 0.734 to 0.818, highlighting the importance of stability, transparency, and clearly defined responsibilities. The 'social participation' factor includes *SP1* to *SP3*, with loadings from 0.838 to 0.853, emphasizing community involvement and feedback. In the factors related to 'roles and responsibilities of the state,' variables *RR1* to *RR4* have loadings between 0.649 and 0.773, emphasizing the critical role of political commitment, coherent policies, and effective legal frameworks. Regarding 'capacity and development of private

partners,' variables *DC1* to *DC3* have factor loadings between 0.769 and 0.785, underscoring the need for robust private-sector financial capabilities and efficient resource management. These findings indicate that a well-balanced combination of socio-economic stability, governmental commitment, private-sector capacity, and appropriate policy measures substantially contributes to successful PPP implementation.

4.4. Confirmatory Factor Analysis

The CFA results, illustrated in Figure 1, clearly indicate that all observed variables have factor loadings above the recommended threshold of 0.5, confirming the strength and validity of the proposed factor structure. These findings provide empirical support for the reliability and coherence of the measurement model. The fit indices confirm the model's adequacy; for example, the Chi-square/df ratio is 1.080, below the recommended threshold of 3; the comparative fit index (CFI) is 0.989, and the Tucker–Lewis Index (TLI) is 0.988, both above the acceptable value of 0.90. The root mean square error of approximation (RMSEA) is 0.020, indicating a good fit as it falls below the 0.08 threshold. These results confirm that the measurement model is reliable and valid, with strong factor loadings and good fit indices supporting the theoretical structure.

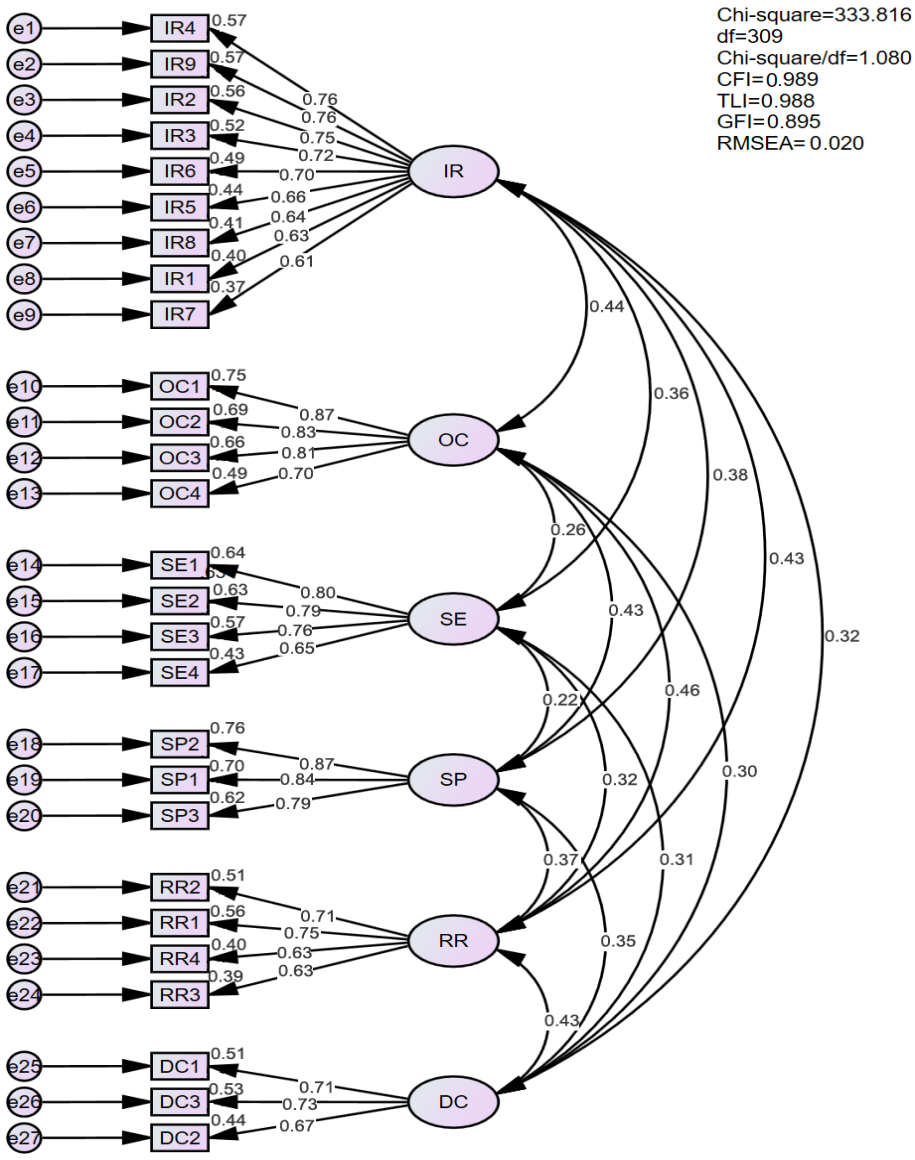

Figure 1. CFA results for the proposed factors in road infrastructure PPP projects.

4.5. Analysis of Relative Importance Index

Following Akadiri et al. (2013), the RII values are converted into five levels of importance: high (H; 0.8 ≤ RII ≤ 1), medium-high (H–M; 0.6 ≤ RII ≤ 0.8), medium (M; 0.4 ≤ RII ≤ 0.6), medium-low (ML; 0.2 ≤ RII ≤ 0.4), and low (L; 0 ≤ RII ≤ 0.2). The importance of the proposed factors, determined by applying the Excel calculation tool, is set out in Table 6.

Table 6. RII results for the proposed factors in road infrastructure PPP projects.

Observed variables	Frequency					Level of significance	RII	Rating
	5	4	3	2	1			
SE1	75	68	20	21	16	3.8250	0.7650	1
SE2	59	77	28	22	14	3.7250	0.7450	2
SE3	66	70	17	27	20	3.6750	0.7350	3
SE4	62	68	25	26	19	3.6400	0.7280	4
RR1	75	68	21	20	16	3.8300	0.7660	1
RR2	57	83	31	14	15	3.7650	0.7530	4
RR3	60	87	19	21	13	3.8000	0.7600	2
RR4	56	89	19	27	9	3.7800	0.7560	3
OC1	74	67	22	25	12	3.8300	0.7660	1
OC2	51	81	24	32	12	3.6350	0.7270	3
OC3	48	86	27	27	12	3.6550	0.7310	2
OC4	52	68	29	33	18	3.5150	0.7030	4
IR1	82	68	14	24	12	3.9200	0.7840	2
IR2	82	78	18	17	5	4.0750	0.8150	1
IR3	4	86	81	18	11	3.2700	0.6540	9
IR4	9	101	54	23	13	3.3500	0.6700	7
IR5	59	77	32	20	12	3.7550	0.7510	3
IR6	51	85	33	20	11	3.7250	0.7450	4
IR7	48	79	36	24	13	3.6250	0.7250	6
IR8	48	81	46	18	7	3.7250	0.7450	5
IR9	7	104	51	20	18	3.3100	0.6620	8
DC1	64	95	20	14	7	3.9750	0.7950	1
DC2	59	74	39	24	4	3.8000	0.7600	2
DC3	51	84	39	18	8	3.7600	0.7520	3
SP1	66	73	33	25	3	3.8700	0.7740	1
SP2	67	71	29	31	2	3.8500	0.7700	2
SP3	55	88	24	27	6	3.7950	0.7590	3

Table 6 presents the results of the RII analysis, which ranks the importance of observed variables in influencing the attraction of road infrastructure PPP projects based on stakeholder responses. The results indicate that the most critical factors are mechanisms to attract and encourage investment (*IR2;* RII = 0.815), financial resources to meet project requirements (*DC1*; RII = 0.795), and fully analyzing project investment cash flow (*IR1*; RII = 0.784). Among the socio-economic factors, a stable socio-economic environment ranked highest (*SE1;* RII = 0.765). For the state's role, the most significant factors were political determination (*RR1;* RII = 0.766) and a clear and transparent legal framework (*RR3*; RII = 0.760). The highest-ranked factor in the state apparatus group was the responsibility, capacity, and experience of state agencies (*OC1;* RII = 0.766). Significant among the social participation factors was the presence of a community supervision mechanism (*SP1*; RII = 0.774). These results highlight the importance of strong financial capacity, supportive policies, and effective governance in attracting private-sector investment in road infrastructure PPP projects.

4.6. Discussions

The results demonstrate the varying degrees to which the variables impact the capacity of financial institutions to mobilize investment capital for road transport infrastructure projects under Vietnam's PPP framework. These findings are grouped by specific factor categories, as detailed below.

With factors related to the socio-economic environment (SE), a stable socio-economic environment (*SE1*) emerged as the most influential variable (RII = 0.765), affirming the first hypothesis. This confirms its essential role in cultivating an investment-friendly climate; economic stability boosts infrastructure demand and motivates financial institutions to effectively mobilize private-sector funding. Following closely, a transparent process, including a clear regulatory framework and a straightforward investment process, is essential to attracting private investors (*SE2;* RII = 0.745). Having well-defined responsibilities (*SE3*; RII = 0.735) ensures that all stakeholders understand their roles, while effective social communication (*SE4;* RII = 0.728) promotes engagement and reduces potential resistance to projects.

Concerning the roles and responsibilities of the state (RR), the findings show that political determination is the most important (*RR1;* RII = 0.766), validating the second hypothesis. This finding is consistent with the literature, confirming that strong political commitment from senior government officials and stable governance structures significantly bolster the effectiveness of financial institutions. The importance of a clear and transparent legal framework (*RR3;* RII = 0.760) reinforces the need for a consistent regulatory environment for the smooth functioning of PPP projects. Having a complete, stable, and unified economic policy is also crucial (*RR2*; RII = 0.753), providing the predictability needed for investor confidence. Effective government support (*RR4*; RII = 0.756) facilitates PPP implementation through administrative assistance and incentives.

In examining state apparatus organization and officer capacity (OC), consistent with the third hypothesis, state agencies' responsibility, capacity, and experience have the greatest impact (*OC1;* RII = 0.766). This result is particularly notable in the Vietnamese context and highlights how a competent and well-structured public administration facilitates investment. Specialized skills of relevant staff and civil servants in policy planning and implementation (*OC3;* RII = 0.731), and their knowledge (*OC2*; RII = 0.727) further contribute to the effective management of PPP projects. While somewhat less influential, the positive attitude of relevant officials and civil servants (*OC4*; RII = 0.703) nonetheless plays a meaningful role in ensuring project success.

The results also confirm the fourth hypothesis, addressing preferential policies and effective risk allocation (IR). The most critical among the factors here is a mechanism designed to attract and encourage private investment by providing favorable conditions (*IR2;* RII = 0.815). This aligns closely with Vietnam's ongoing efforts to create a robust, investment-friendly policy environment. Fully analyzing project investment cash flow (*IR1*; RII = 0.784) assists financial institutions in evaluating feasibility and managing risks. Other notable factors include equitable regulations between state and private partners (*IR5*; RII = 0.751), project transparency and openness (*IR6*; RII = 0.745), an appropriate exchange rate mechanism (*IR8*; RII = 0.745), and an available financial market (*IR7*; RII = 0.725). Additionally, suitable forms of investor support (*IR4*; RII = 0.670), adherence to international practices for dispute resolution (*IR9*; RII = 0.662), and compliance with international principles and agreements (*IR3*; RII = 0.654) further enhance the investment environment.

In the group of factors concerning the capacity and development level of private partners (DC), consistent with the fifth hypothesis, the most influential factor is the availability of financial resources to meet project requirements (DC1; RII = 0.795). This highlights the critical importance of the private sector having robust financial capabilities to ensure project viability. Complementing this, the ability to access resources from financial institutions (*DC2*; RII = 0.760) and effective resource management capabilities (*DC3*; RII = 0.752) reinforce the need for thoroughly prepared private partners to realize successful PPP initiatives.

Finally, under social participation factors (*SP*) aligned with the sixth hypothesis, the most influential is the presence of comprehensive community supervision mechanisms (*SP1;* RII = 0.774). This result underscores the crucial role of community oversight in enhancing institutional transparency and accountability. Actively encouraging community feedback on the quality of transport infrastructure projects (*SP2*; RII = 0.770) ensures alignment with public needs, while implementing comprehensive social impact assessments (*SP3*; RII = 0.759) helps anticipate and address potential negative outcomes.

In summary, the analysis emphasizes that stable economic conditions, steadfast political commitment, effective government policies, private-sector preparedness, and active community participation significantly shape the extent to which financial institutions are able to mobilize investment capital for PPP road transport infrastructure projects in Vietnam. The following section outlines the conclusions and practical implications of this study concerning the enhancement of the investment climate, promotion of project success, and increasing the efficiency of PPP implementation.

5. CONCLUSIONS AND IMPLICATIONS

5.1. Conclusion

The study successfully identified essential factors that influence private-sector participation in PPP projects, specifically focusing on road transport infrastructure development in Vietnam. Utilizing qualitative and quantitative analytical techniques – including Cronbach's Alpha, EFA, CFA, and RII – the research uncovered critical determinants within socio-economic, organizational, and institutional dimensions. The findings clearly indicate that the socio-economic environment profoundly influences private-sector involvement, with the stability of the economic environment (*SE1*) and the transparency of investment processes (*SE2*) being especially important. These elements are critical to encouraging private investment, directly aligning with the research objective of assessing socio-economic impacts on PPP participation. In parallel, the study underscores the significant role of the state by affirming the need for political determination (*RR1*), a clear and consistent legal framework (*RR3*), and stable economic policies (*RR2*). These factors collectively support the state's role in fostering PPP initiatives.

Additionally, the study successfully evaluated organizational capacity, highlighting that state agencies' responsibility, experience, and capacity (*OC1*) substantially affect the effectiveness of project management efforts. Moreover, preferential policies and effective risk-sharing mechanisms, notably those that attract and encourage private investment (*IR2*), emerged as crucial to achieving the objective of mobilizing private investment. The study also emphasized the importance of the readiness and capability of private partners, identifying financial resources (*DC1*) and access to capital (*DC2*) as primary influences. These insights directly contribute to understanding the preparedness of the private sector and their willingness to engage in PPP arrangements. The study further recognized community participation as essential, pinpointing comprehensive community supervision mechanisms (*SP1*) and active stakeholder feedback (*SP2*) as instrumental for project success and societal acceptance. These empirical findings offer robust evidence that can guide policy formulation to enhance financial sustainability, improve risk allocation, and create an environment conducive to investment for successful PPP implementation in Vietnam.

5.2. Implications

Based on the findings, comparisons with prior research, and the contemporary context in Vietnam, several policy recommendations are offered to enhance the ability of financial institutions to attract private capital for road transport infrastructure development under the PPP initiatives.

First, establishing and maintaining a stable socio-economic environment is crucial for building investor confidence regarding long-term economic prospects. Stable macroeconomic conditions, including controlled inflation and consistent economic performance, significantly enhance the attractiveness of the investment climate. This stability is especially critical in light of recent economic disruptions caused by the COVID-19 pandemic. Such stability will strengthen the ability of financial institutions to secure private investments for PPP projects in road transport infrastructure.

Second, formulating and consistently implementing stable policies that affect financial institutions is vital for greater private-sector participation. Strong political commitment at every level of government, from central to local authorities, ensures the effective execution of PPP projects. This commitment provides clear guidance and reduces uncertainty, promoting investor confidence and stimulating long-term investment.

Improving the organizational structure of public institutions is also essential for achieving efficient and effective project management. Streamlining administrative processes, delegating responsibilities appropriately, and aligning institutional practices with international standards will improve project outcomes. Strengthening institutional capacity through targeted training, specialization, and skill development programs for civil servants will further improve organizational effectiveness. Transparent recruitment processes, ongoing professional development, performance-based incentives, and stringent accountability measures will reinforce this institutional framework.

Refining the policy and legal frameworks governing PPP initiatives is equally critical to attracting private investment. These frameworks should carefully balance the state's interests with the competitiveness, security, and attractiveness of PPP projects. Clear, transparent mechanisms for risk allocation that comply with international standards will significantly enhance investor confidence, ensuring the equitable treatment of all stakeholders.

Finally, effective communication regarding policies, legal frameworks, and project benefits is imperative for public awareness and support for PPP initiatives. Transparent information dissemination allows communities to clearly understand infrastructure project goals and benefits, encouraging compliance with relevant regulations. Empowering social organizations and local communities to supervise project implementation and offer constructive feedback will strengthen accountability and solidify the overall framework for PPP project success.

5.3. Limitations

While the study offers valuable insights into the factors influencing private-sector participation in PPP projects for road transport infrastructure in Vietnam, it has certain limitations. Though valid for statistical analysis, the sample of 200 respondents may not fully represent the diversity of stakeholders involved in these projects across regions and sectors. Additionally, the study focused on governmental factors and the role of financial institutions, overlooking the perspectives of other critical stakeholders, such as contractors, project operators, and end users. Future research should consider expanding the sample size, incorporating longitudinal data collection, and including a broader range of stakeholders to provide a more comprehensive understanding of the factors influencing PPP project success. Further studies could also explore the effectiveness of specific policy interventions and risk-sharing mechanisms in enhancing private-sector participation in infrastructure development.

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Transparency: The author states that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.
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