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Financial Risk Assessment in PPP Projects for Affordable Housing

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Abstract

This study aims to identify and evaluate risk related to financial in Public-Private Partnership projects specifically on affordable housing sector in Indonesia. The research was conducted using a qualitative-descriptive approach supported by a structured questionnaire survey distributed to government and private sector stakeholders. The assessment method applied is the Probability-Impact Matrix, which enables systematic evaluation of each risk based on its likelihood of occurrence and its potential impact on project performance. The results indicate that land provision and dependence on public funding are the most significant financial risks, categorized as high and very high levels. Other identified risks include credit and loan availability, construction cost fluctuations, and investment funding stability, all of which pose varying degrees of concern. The study also highlights the importance of experience, position, and educational background of the respondents in providing comprehensive insights into risk perception. The findings conclude that proactive financial risk mitigation, including appropriate cost-sharing mechanisms and contingency planning, is crucial for the sustainability of affordable housing PPP projects. This research offers valuable input for policymakers and private stakeholders in designing more resilient financing strategies for future infrastructure development.

Introduction

Affordable housing remains a major global challenge, as identified by the United Nations in the Sustainable Development Goals (SDGs), particularly Goal 11: "Sustainable Cities and Communities." Rapid urbanization and population growth have intensified the demand for decent and affordable housing. However, many developing countries, including Indonesia, still face a significant gap between housing supply and demand, especially for low-income households. In Indonesia, the housing backlog has exceeded 12.7 million units, with an annual increase of approximately 800,000 new units (Kementerian PUPR, 2022).

Although public initiatives such as FLPP and subsidized mortgage schemes have attempted to address the problem, limited public funding remains a major constraint (Firnanda et al., 2024; Riastiningsih et al., 2025; Somerville, 2024). As a result, the Public-Private Partnership (PPP) scheme has emerged as a potential solution to encourage private sector involvement in affordable housing provision (Alteneiji et al., 2020a). PPP has been successfully applied in various sectors such as toll roads, energy, and clean water. In the housing sector, PPP enables cooperation between the government and developers through risk-sharing mechanisms (Alteneiji et al., 2020; Abera et al., 2025; Adamu et al., 2024).

While countries such as Singapore and Brazil have successfully implemented PPP in large-scale housing delivery for low-income populations (Giti, 2023; Oyamo & Oyatomu, 2025; Oates et al., 2024), its implementation in Indonesia still faces numerous barriers, particularly

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in terms of financial viability and risk allocation. One of the main challenges is the financial risk borne by developers. Affordable housing projects often yield low profit margins, making them less attractive to investors. Factors such as interest rate volatility, fluctuating material costs, and policy uncertainty further exacerbate these risks (Owotemu et al., 2022); Adeloye et al., 2024; Sanda et al., 2020).

In addition, regulatory and institutional complexities, such as lengthy permitting processes and unclear risk-sharing frameworks, reduce private sector confidence. While countries like the United States and the United Kingdom offer fiscal incentives to reduce financial exposure, Indonesia has yet to develop equivalent risk mitigation mechanisms (Schulders, 2022; Siraj et al., 2024; Ginsu et al., 2025). Although previous studies have discussed PPP financing strategies in infrastructure sectors, research specifically focusing on financial risk assessment in affordable housing PPP projects remains limited (Canelas and Alves, 2024; Jiang et al., 2025; Kwofie et al., 2024).

Financial uncertainty directly affects project feasibility and return on investment. According to (Batra, 2023), poorly managed financial risks can lead to project delays, rising operational costs, and lower investment returns. In Indonesia, public funding limitations, price caps on affordable housing, and market demand uncertainty create a mismatch between project economics and policy goals. Developers are often required to sell units at low prices that do not align with high construction and operational costs, discouraging participation (Owotemu et al., 2022; Rodriguez et al., 2024).

Moreover, financial risks are not proportionally distributed; private developers frequently bear greater financial, operational, and market risks, while government support in the form of fiscal incentives or subsidies remains limited (Abel Eseoghene et al., 2022). Even when housing units are built, market demand may remain low due to limited public access to affordable mortgage schemes, further increasing project cash flow risk (Mwendwa et al., 2024). These dynamics highlight the need for a critical evaluation of the most significant financial risks and the development of appropriate mitigation strategies to enhance the viability of PPP-based affordable housing projects.

This study adopts an approach to assess financial risks in PPP affordable housing projects in Indonesia. It systematically identifies, categorizes, and evaluates the most prominent financial risks using the Probability-Impact Matrix (PIM). This approach offers a practical tool for stakeholders to understand risk severity and design appropriate mitigation strategies.

By focusing on financial risk assessment, this study contributes significantly to strengthening more sustainable and resilient PPP practices in Indonesia's affordable housing sector and supports better alignment between project financial feasibility and social objectives.

Methods

His research focuses on the financial risk assessment in Public-Private Partnership (PPP) projects within the affordable housing sector in Indonesia. The primary objective of this study is to identify and evaluate the financial risks involved in such projects and provide recommendations for appropriate risk mitigation strategies to ensure project success. To achieve this objective, the study employs the Probability-Impact Matrix (PIM) method to analyze the financial risks that could potentially affect the success of PPP projects.

The first step in this research is to identify the relevant financial risks, which include financing risks, construction cost fluctuations, market risks, and operational risks that could impact the financial feasibility of the project. After identifying these risks, the necessary data is collected

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through primary sources, namely questionnaires and expert interviews, as well as data from existing regulations related to affordable housing financing.

Once the data is collected, the Probability-Impact Matrix (PIM) is used to assess each risk based on two main factors: probability (the likelihood of the risk occurring) and impact (the financial consequences if the risk materializes). Each risk is assigned scores on these two dimensions to generate a matrix that prioritizes the risks based on their probability and impact levels.

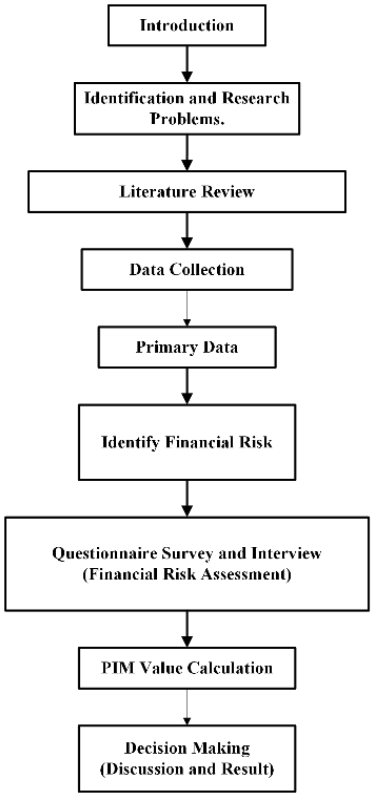

Figure 1. Methodology

Preliminary Analysis

In the initial phase of this study, a preliminary analysis is conducted, which includes formulating the research problem, defining the research objectives, and collecting relevant information from various sources. The information gathered primarily concerns Public-Private Partnership (PPP) projects in the affordable housing sector, with particular focus on the financial risks that may arise during the project implementation. Various types of financial risks are identified, focusing on the potential risks that could occur in project financing, such as fluctuations in construction costs, interest rate changes, and market uncertainties. The results of this preliminary analysis are used to understand the various risks that could affect the success of the project, which will later be used in the financial risk assessment process.

Financial Risk Analysis

In the initial phase of the risk analysis, a questionnaire survey is distributed based on the financial risk variables identified in the preliminary analysis phase. This questionnaire is distributed to both government and private sector stakeholders, as both hold different perspectives on risk assessment. The purpose of this survey is to gather insights regarding the highest financial risks that may occur in the affordable housing project.

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Once the questionnaires are collected, the next step is to calculate the financial risks using the Probability-Impact Matrix (PIM). Using PIM, the identified risks are assessed based on two dimensions: probability of the risk occurring and impact if the risk materializes. After identifying the highest-risk variables, the next step is to identify the financing components associated with those financial risks.

Results and Discussion

The financial risks identified in this study are crucial to understanding the challenges faced in Public-Private Partnership (PPP) projects in the affordable housing sector. The risks can be categorized and assessed using the Probability-Impact Matrix (PIM), which helps in evaluating the likelihood and potential impact of each identified risk.

The identified financial risks can be seen in the following table, which categorizes the risks and provides a brief description:

Table 1. Financial Risk Categories

No.	Code	Risk Category	Description	References
1.	A	Land provision cost	The risk that land provision costs in urban areas becomes more difficult, raising challenges for developers in securing land for the project.	PT PII (2023); (Owotemu and Kale, 2025)
2.	B	Dependence on Public Funding	The risk of relying too heavily on public funds, which may not be sufficient for developers to carry out projects independently.	PT PII (2023); (Fernández et al., 2025)
3.	C	Credit and Loan Risk	The risk associated with difficulties in obtaining loans and low-interest loans for projects, as well as uncertainties related to the financing of public and private sectors.	(Pourafshar et al., 2024)
4.	D	Risk of Tariff and Revenue Structure	The risk of inadequate revenue generation due to fixed tariffs and insufficient revenue to cover project costs.	(Nabirye, 2024)
5.	E	Construction and Operational Costs Risk	The risk that construction costs and operational expenses, such as labor and equipment, will increase during the project.	(Li et al., 2024)
6.	F	Economic Fluctuations and Inflation Risk	The risk of economic instability, including inflation and fluctuations in market conditions, which can affect project costs.	(Owotemu and Kale, 2025)
7.	G	Investment Funding Risk	The risk that fluctuations in investment funding could impact the financial sustainability of the project.	(Fernández et al., 2025)

Source: Processed by Researchers, 2025

Respondent Profile

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This study involved respondents from two sectors: government and private companies (Badan Usaha). According to the data collected, 67% of the respondents are from the private sector, while 33% are from the government. This distribution highlights the diversity of perspectives on financial risks in Public-Private Partnership (PPP) projects, particularly in the affordable housing sector.

Respondent Educational Background

The study also reveals that 67% of the respondents have a master's degree (S2), while 33% have a Bachelor's degree (S1). This data demonstrates a diversity in educational levels among the respondents, encompassing both master's and bachelor's degrees. This indicates that the respondents possess varied levels of understanding and skills, which enriches their perspectives in tackling challenges in the affordable housing sector, especially in managing financial risks.

Respondent Job Positions

Most of the respondents hold managerial positions. Data from the survey indicates that all respondents hold strategic positions, giving them direct influence over the planning and execution of projects. This shows that the respondents play a significant role in decision-making in the affordable housing sector. With their managerial roles, they are directly involved in decisions related to financing, risk management, and project implementation.

Respondent Work Experience

This study also involved respondents with varied work experience. According to the survey data, all respondents have more than 10 years of experience in housing projects. Their extensive experience, particularly in the affordable housing sector, reflects their deep knowledge and understanding of the challenges involved. This wealth of experience enriches their insights into designing and managing affordable housing projects, as well as identifying and addressing financial risks.

Risk Assessment Results

After conducting the questionnaire survey on risk assessment with the respondents, the results were averaged and mapped into a matrix to determine the most significant risks. The table below shows a summary of the risk levels, categorized into different levels based on their combined probability and impact:

Table 2. Risk Assessment Results

Code	Average Probability	Average Impact	Result	Explanation
A	4	5	20	Very High
B	4	4	16	High
C	2.5	2	5	Low
D	2.5	2.5	6.25	Low
E	2.5	2.5	6.25	Low
F	2	2	4	Low
G	2.5	2.5	6.25	Low

Source: Processed by Researchers, 2025

Based on Table 1.2, the highest-risk variable identified is code A, related to Land provision cost. This risk has a probability score of 4 and an impact score of 5, resulting in a total score of 20, categorizing it as Very High (Red). In affordable housing projects, Land provision cost is often a primary challenge. Difficulties in securing suitable land can lead to project delays and significant cost increases. This aligns with the findings of Owotemi and Kale (2025), who

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highlighted land acquisition as an unavoidable risk in housing projects, particularly in urban areas.

Additionally, the second-highest risk is code B, which is the Risk of Dependence on Public Funding. This risk arises from the high dependency of developers on government financial support. If such funding is delayed or reduced, it can result in decreased interest from developers to continue or initiate affordable housing projects. With a probability of 4 and impact of 4, this risk scores 16, placing it in the High (Yellow) category. This finding is consistent with Fernández et al. (2025), who emphasized the importance of stable fiscal support for the success of PPP affordable housing projects.

Conclusion

This research has identified and assessed the key financial risks in Public-Private Partnership (PPP) projects within the affordable housing sector in Indonesia. Through a survey and the use of the Probability-Impact Matrix (PIM), the study highlighted that land acquisition and dependence on public funding are the most significant financial risks in these projects. The findings also emphasized that proper risk management strategies, including the allocation of financial responsibilities between the government and private sector, are crucial for mitigating these risks. The results suggest that understanding both high-probability and high-impact risks, such as construction cost fluctuations and financing challenges, can significantly improve project planning and execution. Based on these findings, it is recommended that both the public and private sectors work collaboratively to develop more flexible financing mechanisms, establish contingency funds, and ensure the stability of fiscal support to minimize the negative impact of these financial risks on affordable housing projects.

Considering these conclusions, it is suggested that future research explore additional risk factors, such as political instability or environmental risks, which may also affect the financial sustainability of PPP projects. Further, policymakers should focus on creating frameworks that offer financial flexibility and risk-sharing provisions, ensuring that both government and private sector stakeholders can contribute to the success and sustainability of affordable housing initiatives in Indonesia.

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