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Review on the Risk Assessment to Determine Guarantee Fee Standardization (Case Study: PT XYZ, Jakarta)

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ABSTRACT: This article thoroughly examines the process of creating a guarantee fee structure based on risk assessment, specifically focusing on PT XYZ as a case study. This addresses the necessity for a systematic methodology to ascertain guarantee fees that precisely reflect the related risks while guaranteeing fairness and openness. The report emphasizes the significance of infrastructure development in driving Indonesia's economic growth and the contribution of state-owned firms such as PT PII. The existing techniques for determining guarantee fees are uneven and need a systematic approach, resulting in protracted negotiations and possible biases. This study seeks to close this divide by presenting a standardized approach derived from thoroughly examining existing literature and evaluating risk factors. These risk factors encompass credit rating, financial stability, loan duration, guarantee scope, project intricacy, past performance, and contingency planning. The methodology's success is demonstrated through its application to PT XYZ Project A, validating its practicality. The results highlight the framework's capacity to offer transparent and fair calculations of guarantee fees that precisely represent the risk profiles of projects.

KEYWORDS: Credit Guarantee, Risk Assessment, Guarantee Fee, Infrastructure, Financing, Standardized Methodology

I. INTRODUCTION

Infrastructure development is fundamental to attaining long-term economic growth, particularly in developing nations such as Indonesia. The Indonesian government has established ambitious infrastructure objectives to enhance national financial stability and public services through substantial transportation, energy, and utilities investments. Nevertheless, funding these infrastructure projects presents significant obstacles due to limited financial resources and the requirement for inventive financing methods. The traditional dependence on the state budget is becoming less and less feasible, which requires us to consider other financing methods.

State-owned enterprises (SOEs), including PT Penjaminan Infrastruktur Indonesia (PT PII), are crucial in tackling these financial difficulties. The primary purpose of PT PII is to offer credit guarantees that improve infrastructure projects' feasibility, attract private investments, and aid in effectively executing essential projects. Despite their crucial significance, the current procedures for determining guarantee fees at PT PII are inconsistent and lack a systematic approach. Ad hoc approaches frequently lead to extended negotiations and possible biases, which obstruct the effective distribution of financial resources and delay project timeframes.

This study seeks to meet the pressing requirement for a standardized approach to computing guarantee fees that precisely capture project risks while maintaining equity and transparency. The research aims to create a guarantee fee structure driven by risk assessment, with PT XYZ's Project A serving as a case study. The main goals are to remove subjective fee assessments, simplify the charge-setting procedure, and improve the overall financial viability of PT PII's guarantee systems. This methodical technique guarantees enhanced effectiveness and synchronizes fee evaluations with the most advanced methods used in the industry, ensuring that all pertinent risk elements are methodically assessed and integrated.

This study aims to investigate the development of a standardized framework for assessing guarantee fees. It will focus on determining the criteria that should be considered in evaluating risk and how these criteria can be weighted to reflect the actual risk of projects accurately. The methodology entails conducting an extensive literature review to establish the theoretical basis. It also involves creating a risk evaluation system incorporating financial and operational criteria. Finally, the methodology includes applying and validating the framework through quantitative analysis of Project A, which belongs to PT XYZ. This study contributes to the broader objectives of national infrastructure development and economic growth by addressing the deficiencies in determining guarantee fees. It offers a scalable methodology that can be customized for different infrastructure projects in various industries.

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II. THEORETICAL FOUNDATION

A. *Government Credit Guarantee*

Government loan guarantees are essential for reducing risks and encouraging investments in crucial areas, particularly in developing economies. They mitigate lenders' risk by guaranteeing loan repayment in the event of borrower default, improving access to advantageous financing terms (Frame & White, 2005). PT Penjaminan Infrastruktur Indonesia (PT PII) leverages these guarantees to support State-Owned Enterprises (SOEs) and private sector firms in promoting infrastructure development.

B. *Guarantee Fee Structure*

Guarantee fees, which compensate guarantors for the risks they undertake are determined by the borrower's creditworthiness, loan amount, and duration. Taghizadeh-Hesary, Yoshino, and Fukuda (2019) highlight the importance of adjusting these fees in response to economic conditions and the individual risks associated with each project. PT PII's fee structure consists of upfront and recurring components, which align with industry standards to guarantee long-term financial viability.

C. *Risk Assessment Models*

Accurate risk evaluation is essential in determining the appropriate guarantee fees. Siahaan's US' Index Theory (2020) presents a technique for assessing the viability of loans by analyzing the relationship between Basic Business Profitability (BBP) and the Loan Interest Rate. When the US Index is more significant than one, it shows enough profitability to cover interest payments, implying a lower risk of default. By incorporating such models, guarantee fees can accurately reflect project risks.

III. RESEARCH METHODOLOGY

The research methodology combines qualitative and quantitative methods to develop a comprehensive guarantee fee structure. The goal is to create a standard pricing structure that can be used for other infrastructure projects, with a particular emphasis on assessing its efficacy through the analysis of Project A, undertaken by PT XYZ.

1. Qualitative Aspect:
    a. Objective: Develop a versatile and adjustable structure for calculating guarantee costs according to risk.
    b. Approach: This involves comprehensively examining relevant literature to collect current information on risk assessment, financial security, and fee structures. Additionally, it entails creating risk evaluation criteria and determining how to allocate weights to them.
2. Quantitative Aspect:
    a. Objective: To implement the designed framework in a particular case study, specifically Project A of PT XYZ, to showcase its practicality and enhance the framework by utilizing real-world data.
    b. Approach: This entails computing the US' Index to measure financial well-being and guarantee eligibility, performing a quantitative risk analysis, and establishing a suitable guarantee fee based on assessed risk levels.

IV. RESULTS AND DISCUSSION

A. *Guarantee Fee Framework Design*

To develop a reliable fee framework, it is crucial to have a comprehensive understanding of the various risk variables that can influence the financial stability of projects. This approach utilizes well-established financial principles and incorporates findings from prominent research publications, such as the works of Taghizadeh-Hesary et al. (2019) and guidelines provided by the European Commission (2021). These sources offer a solid basis for developing a thorough methodology to assess and establish fees, considering the demands and hazards linked to the projects.

Criteria for Risk Assessment: The proposed guarantee fee framework comprises a comprehensive set of criteria to ensure a meticulous evaluation of risks. The literature emphasizes the significance of assessing many attributes, such as the borrower's credit rating and more significant economic indicators. Taghizadeh-Hesary et al. (2019) emphasize the importance of considering the borrower's economic well-being and significant economic indicators. In contrast, the European Commission (2021) promotes a comprehensive strategy encompassing financial data and market conditions. The key criteria identified include:

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Criteria	Description	Justification
Credit Rating	Reflect the borrower's creditworthiness, utilizing ratings from reputable agencies.	Provides a standardized measure of credit risk that is easily accessible and reliable. Credit rating is also a primary indicator of the financial health and default risk of the borrower (ADB, 2019; European Commission, 2021). Higher credit ratings suggest lower risk and better financial stability.
Financial Health	Assesses the overall financial stability and performance criteria, such as DER, Current Ratio, and ICR.	A comprehensive measure of financial viability and operational soundness.
Loan tenor	Assesses the loan's tenure, with longer tenors often reflecting higher risk.	Longer tenors increase exposure to default risk and economic fluctuations.
Guarantee Coverage	Measures the proportion of the loan that is guaranteed, with higher coverage indicating higher risk.	Higher guarantee coverage increases the financial responsibility of the guarantor.
Project Complexity	Assesses the complexity and scale of the project, including technical and operational challenges.	Higher complexity can indicate higher risk and the potential for cost overruns.
Historical Performance	Looks at the past performance of similar projects or the borrower's historical project management track record.	Indicates the ability to manage and complete projects successfully.
Contingency Planning	Evaluates the adequacy of the borrower's contingency plans and risk mitigation strategies.	Effective risk mitigation can significantly reduce the likelihood of default.

. ***Weighted Risk Rating System:*** Each criterion is weighed according to its relative significance, ensuring a fair and thorough evaluation. The procedure utilizes the Simple Multi-Attribute Rating Technique (SMART), a commonly employed method in decision-making to assess and provide weights to different attributes.

Table 1. Proposed: Risk Assessment - Weighting and Scoring Guide

Criteria	Weight	Scoring Range	Parameters for Scoring
Credit Rating	20%	1-5	1: <BBB 2: BBB 3: A 4: AA 5: GRE or AAA
Financial Health	20%	1-5	DER: 1: >2.5 2: 2.0<x≤2.5 3: 1.5<x ≤2.0 4: 1.0<x≤1.5 5: <1.0 Current Ratio: 1: <1.0 2: 1.0<x ≤1.5 3: 1.5<x ≤2.0 4: 2.0<x ≤2.5 5: >2.5

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Criteria	Weight	Scoring Range	Parameters for Scoring
			ICR: 1: <1.0 2: 1.0<x ≤2.0 3: 2.0<x ≤3.0 4: 3.0<x ≤4.0 5: >4.0
Loan tenor	15%	1-5	1: >20 years 2: 15<x ≤20 years 3: 10<x ≤15 years 4: 5<x ≤10 years 5: <5 years
Guarantee Coverage	15%	1-5	1: >80% 2: 60<x ≤80% 3: 40<x ≤60% 4: 20<x ≤40% 5: <20%
Project Complexity	15%	1-5	1: Very Complex (High technical and operational challenges) 2: Complex 3: Moderate 4: Simple 5: Very Simple (Low technical and operational challenges)
Historical Performance	10%	1-5	1: Very Poor (Frequent project delays and cost overruns) 2: Poor 3: Average 4: Good 5: Excellent (Timely completion, within budget)
Contingency Planning	5%	1-5	1: Very Poor (No clear risk mitigation strategies) 2: Poor 3: Adequate 4: Good 5: Excellent (Comprehensive risk mitigation plans)
TOTAL	**100%**		

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Risk Classification: The risk assessment methodology categorizes the risks into low, medium, and high-risk groups, each associated with distinct guarantee fee amounts. To calculate the final risk score, we multiply each criterion's score by its weight and sum the result:

$$Final\ Risk\ Score = \sum_{k=0}^{n} risk\ score\ \times\ risk\ weight$$

After the risk assessment is done, the risk will be graded on the basis of its ultimate risk score. The grading method works as follows:

Table 2. Proposed: Risk Grading

Grade	Total Risk Score
Grade A (Low Risk)	4.5 – 5.0 (10% of the total range)
Grade B (Moderate Risk)	3.0 – 4.49 (30% of the total range)
Grade C (High Risk)	1.0 – 2.99 (60% of the total range)

The grading distribution is intended to represent a balanced approach to risk assessment. A score of 5 across all parameters indicates the lowest possible danger, which corresponds to Grade A. Grade B includes projects with intermediate risk, which are likely to have a mix of higher and lower ratings across many criteria, indicating a nuanced and realistic evaluation of project hazards. Grade C projects are those with a higher risk and a low score on the majority of the criteria.

Higher risk has a substantial influence on the project's financial feasibility and the government's exposure; hence, a more nuanced approach is frequently recommended. In this approach, higher-risk categories have a wider range of scores to reflect the increased variability and uncertainty associated with higher-risk projects.

Justification for the distribution:

1. Grade A (Low Risk): 4.5 – 5.0
   a. Projects with very low risk should have a narrow range because they meet the majority of the criteria at the highest levels. This demonstrates a greater level of confidence and certainty in their performance and financial stability.
   b. The narrow range ensures that only projects with the best risk profiles fall into this group.
2. Grade B (Moderate Risk): 3.0 – 4.49
   a. Represents projects with a mix of high and low scores across multiple criteria, indicating moderate risk.
   b. This category encompasses a broader range of projects, recognizing that many will have a moderate level of risk that must be carefully managed but are still eligible for guarantees.
   c. The wider range for Grade B accommodates a broader spectrum of projects with moderate risk, reflecting the common occurrence of infrastructure projects that fall within this category. This also ensures that the majority of projects are neither excessively risky nor overly conservative.
3. Grade C (High Risk): 1.0 – 2.99
   a. Represents initiatives with the lowest scores across all categories, suggesting significant risk.
   b. Projects of this category are more likely to have lower credit ratings, poor financial health, unfavorable financing terms, significant complexity, and inadequate contingency planning.
   c. This range guarantees that high-risk projects can be easily identified, allowing for suitable risk management measures and higher guarantee fees to compensate for the increased risk.
   d. By designating a major percentage of the spectrum to Grade C, the framework recognizes that many projects, particularly in infrastructure sectors, may have greater risk levels. This promotes rigorous risk assessment and proper pricing of higher-risk promises.

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Guarantee Fee Determination: To determine the guarantee fee (measured in basis points) for each risk grade, it is necessary to ensure that the fees accurately correspond to the risk levels determined by the risk evaluation criteria. The formulation will take into account the expected losses, administrative expenses, and the necessity for financial reserves are strongly linked to the criteria for evaluating risk. The guarantee fee or premium is calculated as a percentage of the guaranteed loan amount and is charged annually.

$$Guarantee\ Fee = Guaranteed\ Loan\ Amount \times Guarantee\ Fee\ Rate$$

Table 3. Proposed: Guarantee Fee

Grade	Guarantee Fee (bps)
Grade A (Low Risk)	50
Grade B (Moderate Risk)	100
Grade C (High Risk)	150

B. ***Application to Case Study (PT XYZ's Project A)***

The practical application of the framework to PT XYZ's Project A involves the following steps:

Step 1 – Eligibility Assessment Using the US' Index: Prior to conducting the comprehensive risk assessment, Project A of PT XYZ must meet the eligibility requirements established by the US' Index. This index assesses the project's feasibility and how well it aligns with the strategic objectives of national infrastructure. In order to advance to the next round, the project must possess a US' Index score that exceeds 1. PT XYZ and Project A qualify for a government guarantee if the US Index score exceeds 1. Using the information from PT XYZ's latest Financial Report (2023), we will calculate the Basic Business Profitability (BBP) and then proceed to the US' Index.

$$BBP = \frac{Earning\ before\ Interest\ and\ Taxes}{Total\ Assets} \times 100\%$$

$$BBP = \frac{398{,}761}{6{,}190{,}857} \times 100\% = 6.44\%$$

Based on the above calculation, according to the BBP, PT XYZ may achieve a 6.44% return on its total assets through its core business operations without including interest and taxes. This indicator indicates the company's ability to efficiently operate and generate profits (efficiency and profitability).

In order to compute the US' Index, it is necessary to ascertain the suitable loan interest rate. It is essential to calculate the interest rate using a weighted average because PT XYZ received loans for Project A from both the Asian Development Bank (ADB) and the Clean Technology Fund (CTF), which is also under ADB's administration. This approach takes into consideration the varying interest rates and fractions of the loans. Utilizing a weighted average interest rate yields a more precise representation of the total expense incurred from the borrowed cash.

The average year-to-date 6-month SOFR rate for 2024 is 5.32%. With a margin of 0.5%, the ADB OCR Interest rate is:

$$ADB\ OCR\ Interest\ Rate = 5.32\% + 0.5\% = 5.82\%$$

Using the loan amounts:

Table 4. Case Application: Weighted Interest Rate

Description	Amount (USD)	Weights	Interest Rate
ADB OCR Loan	300 million	89.55%	5.82%
CTF Loan	35 million	10.45%	0.75%
TOTAL Loan Amount	**335 million**	**100%**	

$$Weighted\ Average\ Interest\ Rate = (89.55\% \times 5.82\%) + (10.45\% \times 0.75\%) = 5.29\%$$

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Using the calculated BBP of 6.38% and the weighted average interest rate of 5.29%:

$$US'\ Index = \frac{Basic\ Business\ Profitability\ (BBP)}{Loan\ Interest\ Rate}$$

$$US'\ Index = \frac{6.44\%}{5.29\%} = 1.22$$

Step 2 – Risk Assessment: Based on the collected data, especially financial data obtained from PT XYZ's most recent financial report (2023), a risk assessment for Project A is carried out in the following manner:

1. Credit Rating: PT XYZ has a credit rating of AAA by FitchRatings, indicating low risk. (Score: 5)
2. Financial Health:
   a. Debt-to-Equity Ratio (DER): $DER = \frac{Total\ Debt}{Total\ Equity} = \frac{2,129,261}{3,290,988} = 0.65$ (Score: 5)
   b. Current Ratio (CR): $CR = \frac{Current\ Assets}{Current\ Liabilities} = \frac{1,078,888}{558,364} = 1.93$ (Score: 3)
   c. Interest Coverage Ratio (ICR): $ICR = \frac{EBIT}{Interest\ Expense} = \frac{398,761}{16,097} = 24.77$ (Score: 5)

   Average Financial Health Score: $Average\ Financial\ Health\ Score = \frac{5+3+5}{3} = 4.33$
3. Loan tenure: 20 years (Score: 2)
4. Guarantee Coverage: Based on the assignment decree, PT PII will bear 50% of the guarantee portion and the rest will be the Ministry of Finance's portion (Score: 3)
5. Project Complexity: Geothermal power projects are technically challenging and often located in remote areas, adding to their complexity (Score: 2)
6. Historical Performance: PT XYZ has a good track record in managing similar projects successfully (previous units), demonstrating their capability in handling the same kind of projects. (Score: 4)
7. Contingency Planning: PT XYZ has a dedicated PMO team for project monitoring and a dedicated risk management division and system, including the risk registers and the mitigation plan. (Score: 4)

Step 3 – Weighted Risk Scoring: Once the risk assessment step is done, the scores are subsequently assigned weights based on their significance:

Table 5. Case Application: Weighted Risk Scoring

Criteria	Weight	Score	Weighted Score
Credit Rating	20%	5	1
Financial Health	20%	4.33	0.87
Loan tenor	15%	2	0.30
Guarantee Coverage	15%	3	0.45
Project Complexity	15%	2	0.30
Historical Performance	10%	4	0.40
Contingency Planning	5%	4	0.20
TOTAL	**100%**	**24.33**	**3.52**

Step 4 –Risk Grading: According to the weighted risk scoring calculation discussed above, the overall risk score is 3.52. According to such information, the risk is classified as Grade B, indicating a moderate risk level.

Step 5 – Guarantee Fee Determination: The guarantee fee is calculated according to the risk rating. The guarantee price for Grade B (Moderate Risk) is 100 basis points (bps), or 1%. The calculation of the guarantee fee is as follows:

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$$Guarantee\ Fee = Guaranteed\ Loan\ Amount \times Guarantee\ Fee\ Rate$$

By utilizing the specified guaranteed loan amount as assigned by MOF to PT PII, which is 50% of the total loan amount of USD 335 million, and applying a guarantee fee rate of 100 basis points,

$$Guarantee\ Fee = 167.5\ million \times 100\ bps = USD1{,}675{,}000\ p.a$$

After conducting a risk assessment and calculation using our risk-based guarantee fee framework, we have determined that the guarantee for the ADB loan to PT XYZ for Project A falls under Grade B (Moderate Risk). As a result, PT XYZ will be required to pay a guarantee fee of 100 basis points (bps) of the total loan amount, which is equivalent to USD1,675,000 per annum, to PT PII.

C. *Business Solution*

To address the challenges identified, the study proposes several business solutions aimed at establishing a robust framework for calculating guarantee fees, ensuring financial sustainability, and reducing risks associated with infrastructure projects.

- **Solution 1: Implementing a Risk Assessment Framework** – A structured system for assessing project risks is crucial for appropriately setting guarantee fees. This framework includes variables such as credit rating, financial health, loan tenure, guarantee coverage, project complexity, historical performance, and contingency planning. By thoroughly evaluating these parameters, PT PII can provide a more precise representation of the actual risk associated with each project.
- **Solution 2: Establishing a Guarantee Fee Calculation Model** – A transparent and consistent framework for calculating guarantee fees is essential for fairness and predictability. The model relies on the weighted ratings obtained from the risk assessment framework to ensure that projects with higher risk levels are assigned correspondingly higher costs.
- **Solution 3: Enhancing Project Monitoring and Support** – Efficient project monitoring and support are vital for mitigating risks throughout the implementation stage. PT PII can ensure that projects remain on schedule and proactively address any issues by providing continuous supervision and support.
- **Solution 4: Strengthening Contingency Planning and Risk Management** – Comprehensive contingency planning and risk management practices are essential for managing unforeseen risks. By adopting these solutions, PT PII can enhance its guarantee mechanisms, ensuring financial sustainability and supporting the successful completion of infrastructure projects.

V. CONCLUSION

This study presents a comprehensive framework for determining guarantee fees based on a systematic risk assessment, addressing the need for transparency and consistency in PT PII's operations. The developed framework incorporates detailed criteria such as credit rating, financial health, loan tenure, guarantee coverage, project complexity, historical performance, and contingency planning, weighted using the Simple Multi-Attribute Rating Technique (SMART) which at the end led to guarantee fee determination based on the risk level the project fells into. By applying this framework to PT XYZ's Project A, the study demonstrates its practical utility and effectiveness in providing a fair and equitable approach to guarantee fee determination.

The findings highlight the framework's ability to diminish subjectivity and inconsistencies in the existing fee-setting procedure, ensuring that fees precisely mirror the underlying risks. This not only enhances the fairness and transparency of PT PII's guarantee mechanisms but also aligns with industry best practices, supporting the financial sustainability of infrastructure projects.

This strategy is essential for improving PT PII's operational efficiency and credibility. By adopting a standardized risk assessment and fee calculation model, PT PII can streamline the fee-setting process, reduce administrative overhead, and ensure equitable treatment of all state-owned enterprises (SOEs). The implementation of improved project monitoring and support methods, coupled with comprehensive contingency planning, enhances PT PII's ability to manage risks effectively and facilitate successful project outcomes.

Future research should focus on refining the framework by incorporating additional risk factors and testing its applicability across diverse project types and sectors. Expanding the framework's scope and adaptability will enhance its robustness and ensure its relevance in various contexts, contributing to the broader goals of national infrastructure development and economic growth. This study lays the groundwork for a more transparent, consistent, and fair approach to guarantee fee determination, positioning PT PII as a key facilitator of sustainable infrastructure development in Indonesia.

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