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The Risk Management And Usage Of The Net Present Value-At-Risk To Evaluate Indonesian Toll Road

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ABSTRACT

This study evaluates the financial feasibility and risk management of toll road infrastructure so as characteristics of toll road projects prone to risks and uncertainties. The study was conducted using case study and qualitative methods. The parameters used to determine the fair value of the project through parameters such as NPV, IRR, Payback Period, NPV at risk, and Risk Adjusted Return on Capital (RAROC) for financial and risk-based feasibility evaluation. This study also conducted a risk assessment in risk management analysis. The study provides various illustrations of possible outputs (NPV) and risk variability so that it can provide a more communicative and varied offer and recommendation, especially for investors as a consideration in making investment decisions. The results of the risk assesment process showed a low to the very high-risk level that requires different treatment. This study contributes understanding the investment in Indonesia toll road project.

INTRODUCTION

The Manado-Bitung toll road project in Indonesia, managed by PT Jasamarga Manado Bitung (JMB), a subsidiary of PT Jasa Marga (Persero) Tbk (Jasa Marga), has been facing challenges in achieving its planned Daily Traffic Volume (LHR). Despite initial feasibility studies considering the development of ports and Special Economic Zones (KEK), the actual LHR has been significantly lower than expected (Wirahadikusumah, 2013). This discrepancy has raised questions about the financial health of the project and the need for a comprehensive evaluation of its financial feasibility and associated risks.

According to research by Fauzan et al., (2023), the Internal Rate of Return (IRR) is an essential metric in determining the success of infrastructure projects. It is used for feasibility assessment, attracting investors, project comparison, and project performance monitoring. However, the realization of a lower-than-planned LHR indicates the need for a re-evaluation of the project's financial feasibility. (Gatti, 2008) emphasized that successful project funding is based on a careful analysis of the risks that will be borne during its economic life. These risks play a crucial role in unexpected changes in the ability to return costs, pay debts, and distribute dividends to shareholders.The Indonesian government, as the initiator of the project, offered

this Government and Business Cooperation (KPBU) project by guaranteeing land acquisition risks, tariff adjustments, politics, land funds, ramp-up, and termination (Bappenas, 2022). However, the low daily traffic conditions indicate that these guaranteed risks may not have been the only factors affecting the project's feasibility. Therefore, a comprehensive analysis of the Manado-Bitung Toll Road project, including its financial feasibility and risk management, is crucial to understand why the project's revenue and financial planning have not gone as expected.

This research is expected to contribute to companies, regulators, and future researchers/academics. Companies can consider the results of this research as a review of investment decisions on financial aspects and assist in recognizing strategies in prevention, handling, and improvement of possible risks that may arise from similar toll road construction projects in the future. Regulators and Stakeholders of Toll Road Management in Indonesia, namely the Ministry of Public Works and Housing (PUPR) and the Ministry of National Development Planning / National Development Planning Agency (Bappenas), can use the results of this research to support the development of more effective policies to improve the financial feasibility of toll road infrastructure and be able to support the economic growth of a region. The research can be used as a useful reference in studying the literature related to the topic of financial feasibility in the field of toll road business and inspire future research related to toll road project investment.

LITERATURE REVIEW

(Brincks et al., 2020) carried out a synthesis of 46 research surveys in 38 countries with a total of 5,155 companies to understand how companies make capital budgeting decisions , calculate the cost of capital (cost of equity) , the amount of debt and how to manage risks in company finances. This aggregation report shows that the most popular techniques used in the world are PBP (59.8% of companies), NPV (57.7% of companies), and IRR (55.8% of companies).

(Gatti, 2008) explains that a successful project funding is carried out based on a careful analysis of the risks that will be borne during its economic life. This risk is a crucial factor in a project because it plays a role in unexpected changes in the ability to recover costs, pay debts, and distribute dividends to shareholders. Risk management steps in a project include risk identification, risk analysis, risk transfer and allocation, as well as residual risk management which is part of the company's steps in risk management.

The methods related to NPV, IRR, and PBP are based on the assumption that the cash flow of a project is certain, while the cash flow of a project can be different from what was previously estimated. Meanwhile, techniques that can provide various possible results involve a stochastic or probabilistic approach. Research related to uncertainty and risk in projects was carried out by Sun et al., (2021) using the NPV at risk analysis method for uncertain financial parameters and forming an investment portfolio model in Korea. This research obtains an optimal investment portfolio with real constraints from a financial perspective. The NPV at risk model has been applied to the Cisumdawu toll road project by Fitriani et al., (2006). The study provides an overview of the possible NPV and risk variability of a project. This model was first developed by (Ye & Tiong, 2000) combining the elements of risk and return in investment assessment. Vagdality (2021) extracted of the NPV and IRR assessment indicators in toll road project which was performed using the @Risk software to support . The Monte Carlo simulation was used to investigate and address the inherent uncertainty in projects.

NPV At Risk Model

This model introduces risk and uncertainty in cash flows by means of stochastic analysis to produce a rate of return (mean) and coefficient of variation as a representation of risk, known as the dual risk return method (Fitriani et al., 2006; (Ye & Tiong, 2000). The project's cash flow will

be discounted at a certain discount rate, namely the Weighted Average Cost of Capital (WACC), which takes into account the composition of the funding structure in capital investment. WACC is the weighted average of cost of equity and cost of debt calculated after tax. The formula used to calculate WACC is as follows:

$$\mathbf{WACC=(Ke \times e\%)+(1\text{-}tax) \times Kd \times d\%}$$

Information :

WACC : discount rate value based on the weight of funding sources, equity and debt

Kd : Cost of equity is obtained from the CAPM (Capital Asset Pricing Model) formula calculation

e% : percentage of the equivalent weight of

tax : corporate tax

Kd : Cost of debt , assumed from BI 7 days repo rate plus 2% margin

d% : percentage of debt used

Cost of Equity uses the CAPM formula as follows:

$$\mathbf{Ke=Rf+\beta\ (CERP)}$$

Information :

Rf : Risk free rate (source from Government Obligation Yield)

β : beta is a representation of the level of sensitivity of an asset's returns to market volatility, from Pefindo

Go to : Cost of equity is obtained from the CAPM (Capital Asset Pricing Model) formula calculation

CERP : country equity risk premium sourced from Damodaran

Research related to risk analysis regarding investment in an infrastructure project is viewed from qualitative research with interviews with experts carried out by Waworuntu (2022) assessing the New Bali International Airport Development Project, namely that there are 37 risk events which are classified into several types of risk and proposed to mitigate the risks that have been identified. In risk management, reviewing the research conducted by (Dewi & Kitri, 2020) with a qualitative approach in a manufacturing company using the ISO 31000:2018 framework, limited to the processes of risk identification, risk analysis, risk evaluation, and risk treatment selection.

METHODS

The design in this research processes all the strategies available to be selected and integrated as research components in a comprehensive and logical way to obtain a design for data collection, measurement and analysis (Trochim, 2006). This research aims to evaluate the financial feasibility and risk management of the Manado – Bitung Toll Road Project once it is fully operational in 2022, analyze the strategy for Public-Private Partnership (PPP) to provide long-term business sustainability, and determine the implementation of Public-Private Partnership Enterprises (PPP) in other countries in addressing the feasibility of infrastructure projects.

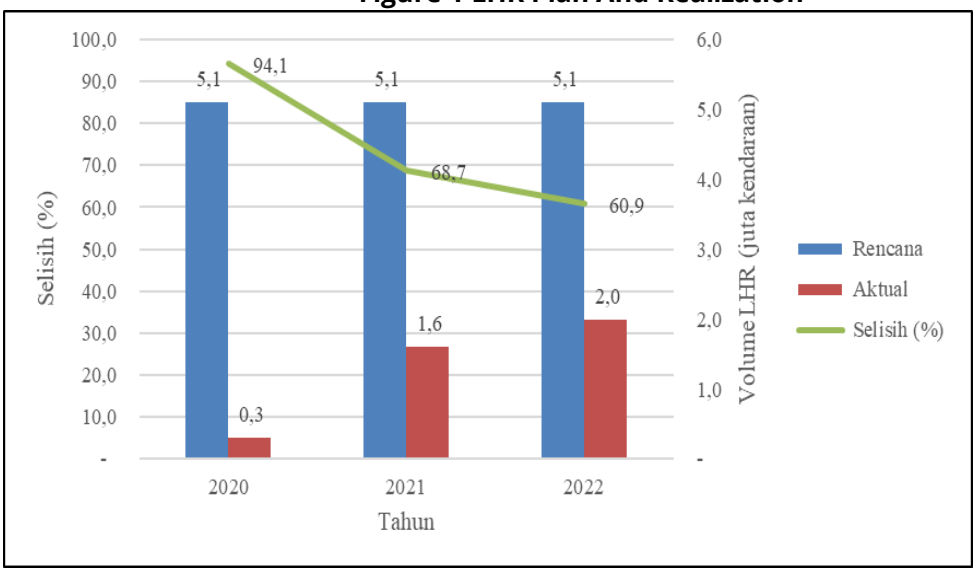
This research uses an explanatory method which aims to provide an explanation of why and how a phenomenon occurs through case studies, literature research and interviews. Research will be analyzed quantitatively using numerical and numerical data to analyze phenomena that can be quantified. Apart from that, qualitative analysis through interviews was also carried out to explore deeper perceptions and understanding. Furthermore, the results of the analysis will provide an overview to obtain conclusions and suggestions.

RESULTS

JMB is a toll road company that was established on June 6, 2016. This company has obtained the concession rights for the Manado Bitung Toll Road located in North Sulawesi Province, Indonesia, with a period of 40 years. JMB and the Government have signed the Toll Road Concession Agreement on June 9, 2016, which was last amended with Amendment VI (PT Jasa Marga (Persero) Tbk, 2024c).

The development of Bitung port is not optimal. The regulator in toll road management, namely the Toll Road Regulatory Agency (BPJT), recorded that the traffic volume of the Manado-Bitung toll road has not yet reached the business plan target since it was operated at the end of the 3rd quarter of 2020. BPJT explained that the traffic volume on the toll road has only reached 22% of the plan (Arief, 2021). The traffic volume in JMB's business plan is to reach 14,000 vehicles per day (Arief, 2021; Mulyana, 2020). Based on this, the Daily Traffic Volume (LHR) per year is targeted to reach 5.1 million vehicle transactions. However, there is a discrepancy between the planning and the facts that occur in the field. This happens because the realization of the Daily Traffic Volume (LHR) is smaller than planned. Based on the data from the Jasa Marga Annual Report, the volume of LHR each year can be known as follows:

Figure 1 LHR Plan And Realization



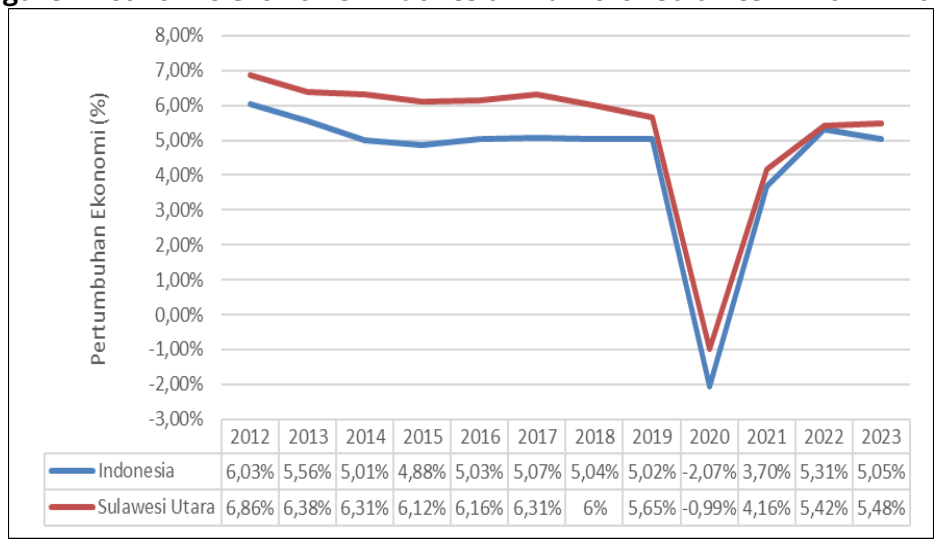
Source: Jasa Marga Financial Report, processed

According to the Ministry of National Development Planning / National Development Planning Agency, (2022), this project is included in the KPBU category that has been successfully implemented by the government. Success from the government's point of view is the acquisition of investors and the project meets the specifications set by the government. According to the Ministry of National Development Planning / National Development Planning Agency (2022), financial feasibility is indicated by 2 (two) indicators, namely an IRR of 12.23% and an NPV of USD 13.7 million. The government provides support and guarantees for several risks, namely land acquisition risk, tariff adjustment risk, political risk, land fund risk, ramp-up risk, and termination risk.

Economic Growth

The economic growth of the region has been observed over the last 11 years. On average, Indonesia's economic growth was at 4.47% and North Sulawesi's was at 5.32%. The economic growth of Indonesia and North Sulawesi from 2012 to 2023 is presented below.

Figure 2 Economic Growth Of Indonesia And North Sulawesi In 2012 – 2023



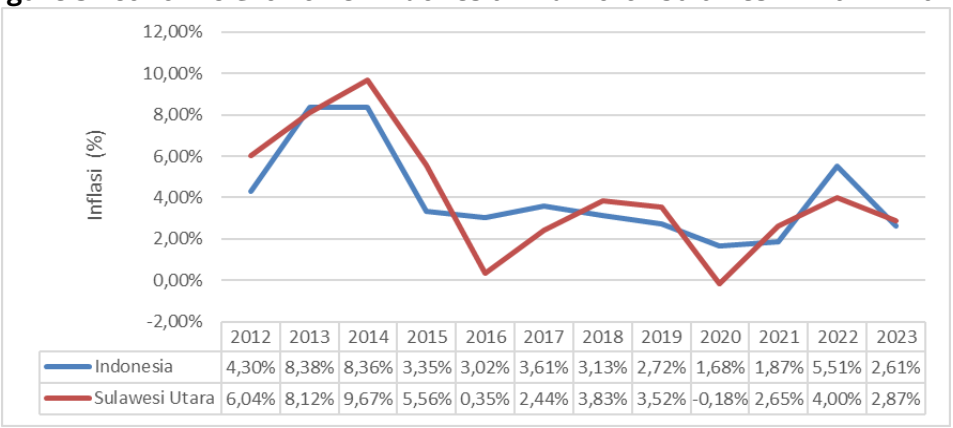
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Indonesia	6,03%	5,56%	5,01%	4,88%	5,03%	5,07%	5,04%	5,02%	-2,07%	3,70%	5,31%	5,05%
Sulawesi Utara	6,86%	6,38%	6,31%	6,12%	6,16%	6,31%	6%	5,65%	-0,99%	4,16%	5,42%	5,48%

Source : (Badan Pusat Statistik Provinsi Utara Sulawesi, n.d.; BPS - Statistics Indonesia, 2024; BPS-Statistics North Sulawesi Province, 2024)

Inflation

The Consumer Price Index (CPI) is an indicator of inflation in a region. Inflation in North Sulawesi Province refers to the inflation rate that occurs in Manado City (BPS-Statistics North Sulawesi Province, 2024). Based on data from the Central Statistics Agency, the inflation in North Sulawesi Province is obtained as follows:

Figure 3 Economic Growth Of Indonesia And North Sulawesi In 2012 – 2023



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Indonesia	4,30%	8,38%	8,36%	3,35%	3,02%	3,61%	3,13%	2,72%	1,68%	1,87%	5,51%	2,61%
Sulawesi Utara	6,04%	8,12%	9,67%	5,56%	0,35%	2,44%	3,83%	3,52%	-0,18%	2,65%	4,00%	2,87%

Source : (Badan Pusat Statistik Provinsi Utara Sulawesi, n.d.; BPS - Statistics Indonesia, 2024; BPS-Statistics North Sulawesi Province, 2024)

The average inflation value from 2012 to 2023 nationally was 4.05%, and in North Sulawesi, it was 4.07%.The toll road revenue has been obtained since it partially operated in October 2020 until now. The revenue and traffic volume data obtained from the Jasa Marga Financial Report is presented in the following table:

Tabel 4

Year	2020	2021	2022	2023
Total Revenue (IDR billion)	6,7	35,7	51,2	54
Total Traffic Volume (million vehicles)	0,3	1,57	1,98	2,01

Source : (PT Jasa Marga (Persero) Tbk, 2024)

Risk Management

Next, potential risks in the Manado-Bitung toll road project were identified through interviews with informants. The main topics mentioned by the informants were counted based on the frequency of their mention and then grouped into similar topics to identify the types of risk events as follows:

Table 5 Recording The Number Of Key Risk Identification Topics

NO	Main Topic	N1	N2	N3	N4	N5	Total
1	Toll Revenue	2	1		1	1	5
2	Tariff	1		1			3
3	Government Policy or Regulation	1	1			1	3
4	Traffic Volume	1	5	1	3	2	12
5	Area around the toll road	1	1	1		1	4
6	PPJT*	5	4			1	10
7	Business Expenses	2					2
8	Delay in project construction		1	1			2
9	Government Compensation		3				3
10	IRR		6				6
11	Land limitation		1				1
12	Cash flow				2		2
13	Loan Interest				2		2
14	Investment Value					1	1
15	Inflation					2	2
16	Operation Cost					2	2
17	ATP & WTP					1	1
18	Consumer Behaviour					1	1
19	Area around toll road location					1	1
20	Other roads					3	3
	Number of Topics	7	9	4	5	12	

Notes: * PPJT is Toll Road Concession Agreement

Based on the table identifying topics related to risk identification mentioned above, the topics were subsequently ranked. The topics were arranged in descending order based on the number of mentions, from the most frequent to the least frequent. The ranking of the topics can be seen in the following table:

Table 6 Order Of Risk Identification Topics

NO	Main topic	Total
1	Traffic Volume	12
2	Toll Road Concession Agreement	10
3	IRR	6
4	Toll Revenue	5
5	Area around toll road	4
6	Tariff	3
7	Government Policy or Regulation	3
8	Government Compensation	3
9	Other roads	3

10	Business Expenses	2
11	Delay in project construction	2
12	Cash flow	2
13	Loan Interest	2
14	Inflation	2
15	Operation Cost	2
16	Land limitation	1
17	Investment Value	1
18	ATP & WTP	1
19	Consumer Behavior	1
20	Area around toll road location	1

Jasa Marga, as the parent company of JMB, developed a risk taxonomy based on the aforementioned table, arranging potential risks in a more specific manner. The state-owned enterprise (BUMN) risk taxonomy consists of up to 3 levels. Jasa Marga has extended this to level 4, which includes similar risk groups, and level 5, which encompasses potential negative events for the company. The following is the identification of T5 risks, referring to the BUMN and company risk taxonomy:

Table 7 Results Of T5 Risk Identification Referring To Bumn And Company Risk Taxonomy

T1	T2	T3	T4	T5
1. Risiko Portofolio Bisnis	1.1. Risiko Fiskal	1.1.1. Risiko Dividen	1.1.1.1. Pembayaran Dividen	Potensi kegagalan perusahaan dalam membayarkan dividen kepada APBN
1. Risiko Portofolio Bisnis	1.1. Risiko Fiskal	1.1.1. Risiko Dividen	1.1.1.1. Pembayaran Dividen	Potensi kegagalan perusahaan dalam membayarkan dividen kepada shareholder
1. Risiko Portofolio Bisnis	1.1. Risiko Fiskal	1.1.2. Risiko PMN	1.1.2.2. PMN (Penerimaan Modal Negara)	Potensi adanya ketidak selarasan tujuan strategis dan prioritas antara perusahaan dan pemerintah
1. Risiko Portofolio Bisnis	1.2. Risiko Kebijakan	1.2.5. Risiko Kebijakan Sektoral	1.2.5.8. Kebijakan Sektoral	Potensi adanya perubahan kebijakan atau regulasi pemerintah yang mempengaruhi bisnis Jasa Marga
1. Risiko Portofolio Bisnis	1.2. Risiko Kebijakan	1.2.5. Risiko Kebijakan Sektoral	1.2.5.8. Kebijakan Sektoral	Potensi adanya perubahan peraturan dan kebijakan Pembangunan Nasional
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.9. Risiko Formulasi Strategi	3.6.9.13. Major Initiatives	Potensi adanya inefisiensi dalam menghasilkan keuntungan dari modal yang telah diinvestasikan
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.9. Risiko Formulasi Strategi	3.6.9.14. Planning & Resource Allocation	Potensi Inefisiensi dalam menghasilkan keuntungan dari modal yang telah diinvestasikan
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.10. Risiko Pasar & Makro Ekonomi	3.6.10.16. Macroeconomic Factors	Potensi meningkatnya suku bunga pinjaman
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.10. Risiko Pasar & Makro Ekonomi	3.6.10.16. Macroeconomic Factors	Potensi adanya inflasi, penurunan GDP dan perubahan faktor makroekonomi lainnya yang mempengaruhi bisnis Jasa Marga
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.11. Risiko Keuangan	3.6.11.19. Revenue Cycle	Potensi meningkatnya beban keuangan
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.16. Risiko Operasional	3.6.16.36. Risiko Usaha Jalan Tol	Potensi adanya keterlambatan pengoperasioan jalan tol baru
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.16. Risiko Operasional	3.6.16.36. Risiko Usaha Jalan Tol	Potensi rendahnya Lalu Lintas Harian Rata-Rata (LHR)
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.16. Risiko Operasional	3.6.16.36. Risiko Usaha Jalan Tol	Potensi kenaikan biaya operasional dan pemeliharaan jalan tol
3. Risiko Bisnis	3.6. Risiko Industri Umum	3.6.16. Risiko Operasional	3.6.16.38 Risiko Usaha secara Umum	Potensi realisasi kelayakan bisnis lebih rendah dari yang direncanakan

From the aforementioned risks, they were then categorized into 7 risk categories The most frequently occurring risk is operational risk, accounting for 28.6%, followed by dividend risk, sectoral policy risk, strategy formulation risk, market & macroeconomic risk, and lastly PMN and financial risk., as shown in the following table:

Tabel 8

No	T3	Number of Risk Events	Percentage (%)
1	Dividend Risk	2	14,3
2	State Capital Injection (PMN) Risk	1	7,1
3	Sectoral Policy Risk	2	14,3
4	Strategy Formulation Risk	2	14,3
5	Market & Macroeconomic Risk	2	14,3
6	Financial Risk	1	7,1
7	Operational Risk	4	28,6
	Total	14	100

Risk Treatment

Based on the results of the risk assessment, each risk has been classified into one of five categories according to its level. This study will focus on risk treatment for two categories: Moderate to High and High.

Based on the guidelines and interview results, an analysis was conducted on all identified risks by assessing the likelihood of risk occurrence and its impact. Both likelihood and impact are rated on a scale of 1 to 5, with 1 being the lowest and 5 being the highest. Subsequently, the likelihood value is multiplied by the impact value, resulting in a new value representing the risk level. The lowest risk level is 1, and the highest is 25.

Table 9 Grouping Of Risks Based On T3

NO	KELOMPOK (T4)	DESKRIPSI RISIKO (T5)	*P* 1	*I* 2	*L* (1 x 2)	TINGKAT
1	Pembayaran Dividen	Potensi kegagalan perusahaan dalam membayarkan dividen	3	5	15	Moderate
2	Pembayaran Dividen	Potensi kegagalan perusahaan dalam membayarkan dividen	3	5	15	Moderate
3	PMN (Penerimaan Modal Negara)	Potensi adanya ketidak selarasan tujuan strategis dan prioritas antara perusahaan dan pemerintah	4	5	20	High
4	Risiko merger, akuisisi, kerja sama strategis, dan privatisasi	Potensi kegagalan merger/akuisisi/kerjasama strategis/privatisasi perusahaan	1	1	1	Low
5	Revenue Cycle	Potensi meningkatnya beban keuangan	5	5	25	High
6	Kebijakan Sektoral	Potensi adanya perubahan peraturan dan kebijakan Pembangunan	3	5	15	Moderate
7	Major Initiatives	Potensi adanya inefisiensi dalam menghasilkan keuntungan dari modal yang telah diinvestasikan	4	5	20	High
8	Macroeconomic Factors	Potensi meningkatnya suku bunga pinjaman	2	2	4	Low
9	Macroeconomic Factors	Potensi adanya inflasi, penurunan GDP dan perubahan faktor makroekonomi lainnya yang mempengaruhi bisnis Jasa Marga	3	3	9	Low to Moderate
10	Revenue Cycle	Potensi meningkatnya beban keuangan	5	5	25	High
11	Risiko Usaha Jalan Tol	Potensi adanya keterlambatan pengoperasioan jalan tol baru	1	3	3	Low
12	Risiko Usaha Jalan Tol	Potensi rendahnya Lalu Lintas Harian Rata-Rata (LHR)	5	5	25	High
13	Risiko Usaha Jalan Tol	Potensi kenaikan biaya operasional dan pemeliharaan jalan tol	3	3	9	Low to Moderate
14	Risiko Usaha secara Umum	Potensi realisasi kelayakan bisnis lebih rendah dari yang	5	5	25	High

The following table presents the risk analysis, incorporating the likelihood (P), impact (I), and resulti Based on the risk ranking table above, the identified risk levels are subsequently grouped according to the likelihood and impact of the assessment conducted in the risk analysis in the previous sub-chapter. The results of the risk category groupings from the risk analysis are presented in the risk level matrix in the table below.

Table 10 Risk Evaluation Matrix Results

PROBABILITAS						
	Hampir Pasti Terjadi 5	Low To Moderate	Moderate	Moderate To High	High	High (5,10,12,14)
	Sangat Mungkin Terjadi 4	Low (8)	Low To Moderate (9,13)	Moderate	Moderate To High	High
	Bisa Terjadi 3	Low (11)	Low To Moderate	Moderate	Moderate To High	High
	Jarang Terjadi 2	Low	Low To Moderate	Low To Moderate	Moderate To High	High
	Sangat Jarang Terjadi 1	Low (1)	Low	Low To Moderate	Moderate (1,2,6)	High (3,7)
		Sangat Rendah 1	Rendah 2	Moderate 3	Tinggi 4	Sangat Tinggi 5
		DAMPAK				

Source : Processed

Based on the previous results, strategies are needed to improve the financial feasibility of the Manado-Bitung Toll Road. In this study, the following scenarios will be implemented:

Table 11 Types Of Scenarios For Improving Project Feasibility

NO	Scenario Name	Description
1	Scenario A	Implementing Operational and Maintenance Cost Efficiency
2	Scenario B	Implementing Debt Repayment

Scenario A: Operational and Maintenance Cost Efficiency

This scenario proposes a 20% reduction in operating expenses from the baseline to improve the project's feasibility. This efficiency improvement is planned to begin in 2025 to allow for internal preparations and negotiations with external service providers involved in operation and maintenance. The efficiency measures will target various costs, including those related to toll road users, cooperation with other Jasa Marga Group subsidiaries (PT JMTO and PT JMTM), road maintenance, overlay provisions, and general administrative expenses.

DISCUSSION

The traditional methods for evaluating project feasibility, such as Internal Rate of Return (IRR) and Net Present Value (NPV), yield single values, providing limited information. Investment decisions, however, inherently require a range of possible outcomes due to the uncertainties and risks involved in capital investments. NPV at risk (NPV@Risk) offers a variety of possible outcomes as a basis for decision-making. Additionally, NPV@Risk presents an alternative approach to investment decision-making, providing an NPV value at a specific confidence level.

In the simulation above, the NPV results obtained were higher than the single value derived from the conventional NPV calculation. The conventional NPV calculation itself determined that the NPV of this project is negative.

Based on the RAROC results, a value of 1.14% was obtained, which is smaller than the cost of equity of 7.22%. According to (Finnerty, 2013), when the RAROC value is smaller than the cost of capital, the project is not acceptable. Based on the financial feasibility analysis using IRR, NPV, PBP, and RAROC methods, it is indicated that this project is not economically feasible. The revenue generated by the project is not sufficient to provide a return within the limits acceptable to investors or sponsors.

Investors or business entities participating in Public-Private Partnerships (PPPs) must involve their legal and risk management teams to conduct an in-depth analysis of the clauses within the Concession Agreement (PPJT). A detailed examination of each article is necessary to ensure the business entity has a strong position in the agreement. Furthermore, it is crucial to clearly define the risks outlined in the PPJT, as well as the rights and obligations of each party (the toll road business entity and the government).

CONCLUSION AND SUGGESTION

Based on the feasibility analysis of the Manado-Bitung Toll Road, several conclusions can be drawn:Financial Feasibility and Risk Management Evaluation: The financial feasibility and risk management evaluation of the Manado-Bitung Toll Road project, after full operation, reveals that the project does not meet the required criteria. The most prevalent risks are operational, accounting for 28.6%, followed by dividend, sectoral policy, strategy formulation, market & acroeconomic risks, and lastly, PMN and financial risks. Each risk requires specific treatment according to its respective risk assessment. Public-Private Partnership (PPP) Strategy Analysis: The analysis of Public-Private Partnership (PPP) strategies to ensure long-term business sustainability was conducted internally, focusing on efficiency measures and accelerated debt repayment. However, the results indicate that these measures alone are not sufficient to

improve the feasibility of the JMB project, as the IRR remains lower than the WACC and the NPV remains negative. Addressing this situation requires external assistance, particularly from the government, in terms of policies that support the sustainability of the toll road.

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