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Financial Feasibility Study to Determine the Best Funding Structure for Garuda Project in Pt Asgardian Muda

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ABSTRACT

The pharmaceutical industry faces growing regulatory challenges and financial constraints when expanding into new markets. This study evaluates the financial feasibility of the Garuda Project, a strategic initiative by PT Asgardian Muda to build a pharmaceutical manufacturing facility meeting European Good Manufacturing Practices (GMP) standards. The aim is to determine the most suitable funding structure to ensure financial sustainability and regulatory compliance. The research uses both qualitative and quantitative methods, including financial performance analysis, stakeholder evaluation, and investment feasibility assessment. Key financial metrics, such as Net Present Value (NPV), Internal Rate of Return (IRR), and Weighted Average Cost of Capital (WACC), are applied to compare different funding options: internal financing, debt-based funding, and hybrid models. Sensitivity analysis also examines the impact of factors like interest rates, Cost of Goods Sold (COGS), demand fluctuations, and delayed regulatory approval on financial viability. Findings indicate that all scenarios are financially feasible, with IRRs surpassing the WACC. The 50% equity and 50% debt hybrid model performs best, offering the highest NPV (up to IDR 226 billion), a lower WACC (8.74%), and the shortest payback period (2044). Sensitivity analysis shows the project is most sensitive to regulatory approval delays and market demand fluctuations. The Garuda Project is both economically and strategically viable, with the hybrid funding model providing an optimal balance between profitability and risk. If the company adheres to its zero-debt policy, the project remains feasible under a 100% equity structure, although with reduced financial efficiency.

KEYWORDS *Financial feasibility, funding structure, pharmaceutical industry, investment analysis.*

INTRODUCTION

The rapid evolution of global pharmaceutical markets presents both opportunities and challenges for companies striving to expand their footprint and remain competitive (Damodaran, 2010). Expanding into international markets is a critical strategic move for pharmaceutical companies seeking growth, diversification, and increased global competitiveness (ASEAN Consultative Committee for Standards and Quality [ACCSQ], 2016). For *PT Asgardian Muda*, a prominent player in the pharmaceutical industry, especially in the painkiller category, entering the European market represents a significant opportunity to establish its presence in one of the world's most regulated and lucrative healthcare regions (Berzkalne & Zelgalve, 2012).

This study represents one of the few comprehensive financial feasibility analyses focused specifically on Indonesian pharmaceutical companies' funding structure decisions for European market entry (Brigham & Houston, 2018). While extensive literature exists on pharmaceutical expansion strategies, limited research has examined the unique capital structure challenges faced by emerging market pharmaceutical firms when investing in EU-GMP compliant facilities, making this study particularly novel in the Indonesian context (Brealey, Myers, & Allen, 2019).

PT Asgardian Muda's flagship products have the potential to meet the growing demand in Europe for reliable and effective treatments in their therapeutic category (Zhang, Chen, & Wang, 2018). The European market, known for its preference for high-quality pharmaceutical products that meet stringent safety and efficacy standards, aligns with *PT Asgardian Muda*'s commitment to quality and innovation. However, entering Europe requires strict adherence to the European Medicines Agency (EMA) standards and the Pharmaceutical Inspection Co-operation Scheme (PIC/S), which impose rigorous requirements for product safety, efficacy, and manufacturing quality. These regulations encompass Good Manufacturing Practices (GMP), environmental sustainability, and traceability, making compliance a cornerstone for market entry (Ding, Liu, & Zhang, 2024).

For Indonesian pharmaceutical companies, one of the biggest hurdles in entering the European market is compliance with European GMP (Good Manufacturing Practice) standards (Noerman & Faturohman, 2024). The ASEAN GMP framework, which is widely adopted in Southeast Asia, follows WHO, (2020) GMP guidelines but allows for more flexibility in certain areas, particularly in terms of water systems, environmental monitoring, and documentation requirements (Divya & Viswambharan, 2019).

European GMP imposes stricter requirements, including comprehensive HVAC validation with airflow patterns, HEPA filtration, and differential pressure monitoring; continuous environmental monitoring including microbial and particulate testing in sterile production areas; mandatory equipment validation through Installation Qualification, Operational Qualification, and Performance Qualification; and detailed batch documentation and validation reports subject to unannounced regulatory inspections (Glover, Pham, & Shively, 2021).

International benchmarks provide valuable context for this analysis. Similar pharmaceutical expansion studies from emerging markets demonstrate varying approaches to funding structure optimization (Pharmaceutical Inspection Co-operation Scheme [PIC/S], 2021). Indian pharmaceutical companies like Dr. Reddy's and Cipla have successfully employed debt-equity hybrid models for European facility development, achieving cost of capital optimization while maintaining regulatory compliance. Chinese firms such as Jiangsu Hengrui have utilized different capital structure strategies, often favoring higher equity ratios due to domestic financial market characteristics (Rejison, 2024). Eastern European pharmaceutical companies entering EU markets have shown preferences for government-backed financing mechanisms, highlighting the importance of regulatory environment in funding decisions (Ross, Westerfield, & Jaffe, 2013).

Currently, the existing production facility at *PT Asgardian Muda* is not equipped to meet the stringent regulatory standards set by the European market. The limitations of the current infrastructure present a significant barrier to manufacturing products that can be approved for European distribution. As such, the company recognizes the urgent need to build a new production facility that aligns with European requirements, ensuring product compliance and enhancing the company's competitive advantage in the global market (Setyandri & Rahadi, 2023).

This initiative is directly tied to the company's long-term strategic goal of entering the European market. It represents a critical investment aimed at positioning *PT Asgardian Muda* as a globally competitive pharmaceutical producer. To fulfill this goal, the company must not

only allocate substantial resources for the construction of the new facility but also secure sufficient funding to finance this significant investment project (Sutejo & Rahadi, 2023).

To achieve these long-term goals, the construction of new facilities is required because if improvements were made to the existing facilities, the necessary changes would be so significant that a major redesign of the current facility would be needed. Additionally, this improvement process would disrupt the operational activities of the existing production, as the production process for this backbone product cannot be transferred to toll manufacturing with another industry due to the confidentiality of the formula and the process of the backbone product. This large-scale project demands substantial funding, requiring careful planning to design a compliant facility with efficient processes, a robust quality system, and a sustainable financial strategy (Virlics, 2013).

Investing in a new pharmaceutical manufacturing facility demands substantial financial resources, given the costs associated with land acquisition, facility construction, equipment procurement, validation processes, and regulatory approvals. The capital-intensive nature of pharmaceutical expansion makes funding a critical aspect of the project's feasibility.

Pharmaceutical companies, particularly those from emerging markets, face financial constraints due to limited access to large-scale investments and high borrowing costs. Financial risks such as fluctuations in interest rates, currency exchange rates, and raw material costs further complicate investment decisions. Companies must carefully assess their capital structure, balancing internal funding, debt financing, and potential equity investment to minimize financial risks.

Given the scale and financial implications of this undertaking, a comprehensive financial analysis is required to evaluate the company's current financial condition and its ability to sustain the investment. This analysis will assess the company's financial capability, identify potential funding options, and determine the most suitable financial structure to support the project. Additionally, leveraging financial instruments, such as debt or equity financing, will be critical to ensure the feasibility and sustainability of the project. *PT Asgardian Muda*'s expansion into the European market requires a comprehensive financial feasibility study to determine the best funding structure. The company must evaluate multiple financing options, including internal funding, debt financing, and hybrid models, to ensure the investment remains viable while maintaining financial stability.

The construction of a new production facility is not merely an operational upgrade—it is a strategic leap toward achieving *PT Asgardian Muda*'s long-term vision of entering the European market. By conducting a thorough financial analysis and leveraging appropriate financial mechanisms, the company can ensure that this investment aligns with its growth ambitions while maintaining financial stability.

METHOD

This study employs a case study design with a mixed-method approach, combining quantitative financial modeling with qualitative stakeholder analysis to comprehensively evaluate funding structure alternatives for the *Garuda* Project. The research follows established ethical compliance protocols, ensuring confidentiality of proprietary financial information and obtaining informed consent from all interview participants. The research design aims to identify, analyze, and compile a systematic and structured methodological framework. At this

stage, it is essential to define the variables to be studied and determine appropriate measurement methods. The company's long-term goal is to penetrate the European market. To achieve this, the organization faces a critical challenge: the need to build a new facility.

1. Company Long-Term Goal: Penetrate European Market

The foundation of this research begins with the company's strategic objective to penetrate the highly regulated European pharmaceutical market. Achieving this goal requires meeting stringent European Medicines Agency (EMA) and Pharmaceutical Inspection Co-operation Scheme (PIC/S) standards, particularly in the areas of quality, safety, and production compliance. Given that existing manufacturing facilities may not fully comply with EU-GMP standards, the company identifies the need for a new facility that adheres to European regulatory frameworks. This expansion ambition sets the direction for the entire research process.

2. Business Issue Identification: Challenge to Build a New Facility

Following the strategic goal, the core business issue is the need to construct a new pharmaceutical manufacturing facility that meets EU-GMP standards. This represents a significant capital investment and introduces complex challenges related to financial feasibility, funding structure, risk management, and compliance. The research identifies that beyond technical construction, the real issue lies in the formulation of an optimal investment and financing strategy that ensures long-term financial sustainability and regulatory approval. Hence, the business issue becomes the focal point for deeper investigation and problem formulation.

3. Problem Formulation

The business issue leads to the formal articulation of the research problem, which focuses on determining the most feasible investment and funding configuration for the new facility. The formulated research question addresses three key dimensions: (1) assessing whether the company is financially prepared to undertake the project, (2) identifying potential funding structures that balance cost, risk, and control, and (3) evaluating the project's financial viability through established investment appraisal techniques. This formulation provides a structured basis for selecting the data sources, analytical methods, and scenario evaluations.

4. Data Collection

To comprehensively address the research problem, data collection involves both qualitative and quantitative approaches. Primary data are obtained through interviews with Subject Matter Experts (SMEs), including financial managers, GMP consultants, and project engineers. These interviews provide insights into investment risks, regulatory timelines, and internal organizational readiness. Secondary data are sourced from project proposal documents, financial reports, previous investment performance, and cost estimates related to facility construction. These data are essential for conducting financial modeling and validating assumptions used in the feasibility analysis.

5. Analysis Investment (Main Analytical Framework)

This core analytical phase consists of several integrated components designed to examine different aspects of the investment decision.

a. Analysis of Funding Readiness

This step evaluates the internal capabilities of the company to fund the investment project. It considers the availability of retained earnings, financial ratios, credit standing,

and historical capital structure to determine how much of the funding can be supported internally versus externally. This readiness assessment is essential for setting realistic boundaries on funding options and for aligning financial capability with project scope and risk tolerance.

b. Configuration of Funding Proposed

Based on the readiness assessment, this step involves designing multiple funding structures that may include combinations of equity financing, bank loans, bond issuance, or hybrid instruments such as convertible debt. The configurations are developed with attention to cost of capital, repayment capacity, regulatory restrictions, and investor interest. This step ensures that the company has a variety of funding options that can be evaluated based on their impact on financial performance and risk exposure.

c. Evaluate Company Financial Performance

Quantitative tools such as Net Present Value (NPV), Internal Rate of Return (IRR), and Weighted Average Cost of Capital (WACC) are applied to assess the financial viability of the investment under each funding structure. This step determines whether the proposed project yields positive returns under realistic assumptions.

6. Sensitivity Analysis

Sensitivity analysis is conducted on the three funding configurations to test the robustness of the financial performance under different risk scenarios. Key variables such as interest rate fluctuation, increase of cost of raw materials (COGS), delayed regulatory approval, and revenue fluctuation are simulated to see how they affect NPV and IRR outcomes. This risk-adjusted approach enhances the reliability of the investment recommendation and prepares management for real-world volatility.

7. Conclusion and Recommendation

Based on all the analyses, the final step synthesizes the findings into actionable conclusions. The most feasible funding configuration is selected based on financial viability, risk exposure, and strategic alignment. In addition, recommendations are provided for mitigating potential risks, improving capital efficiency, and aligning investment decisions with long-term corporate goals. This section also reflects on regulatory and market challenges, ensuring the investment strategy supports successful entry into the European market.

This research integrates both qualitative and quantitative methods, ensuring a balanced evaluation that considers financial feasibility, regulatory compliance, and industry insights. The mixed-method approach allows for a more holistic view, combining numerical analysis with strategic insights from industry experts and market conditions.

A quantitative approach in this research focuses on numerical data and financial modeling to assess the feasibility of *PT Asgardian Muda*'s pharmaceutical facility expansion. The primary quantitative methods used include Net Present Value (NPV), Internal Rate of Return (IRR), and Weighted Average Cost of Capital (WACC) to evaluate investment feasibility.

Funding decisions are critical for *PT Asgardian Muda*'s pharmaceutical facility expansion as they determine financial sustainability, risk exposure, and return on investment (ROI). The research evaluates three funding scenarios: 100% internal funding, hybrid 75-25

(equity-debt), and hybrid 50-50 (equity-debt). These funding models were chosen to provide a balanced approach to financing the project while considering factors such as cash flow management, risk minimization, and cost of capital.

Additionally, sensitivity analysis is applied to measure the impact of cost fluctuations, revenue growth variations, and regulatory delays on profitability. These numerical assessments provide objective and data-driven insights, helping *PT Asgardian Muda* make financially sound investment decisions by comparing various funding structures such as 100% equity financing, hybrid 75% equity - 25% debt, and hybrid 50% equity - 50% debt.

On the other hand, a qualitative approach provides contextual insights that complement financial analysis by incorporating expert opinions, regulatory considerations, and industry-specific knowledge. Interviews with financial analysts, regulatory professionals, and pharmaceutical industry stakeholders offer insights into market risks, funding strategies, and regulatory challenges that cannot be captured by numerical models alone. Additionally, regulatory analysis ensures that *PT Asgardian Muda*'s expansion aligns with EMA and PIC/S requirements, avoiding potential compliance risks that could delay market entry.

Sensitivity analysis is incorporated to address financial risks and uncertainties that could impact the project's success. Since pharmaceutical investments are subject to regulatory delays, cost overruns, and market demand fluctuations, sensitivity analysis helps *PT Asgardian Muda* evaluate how these uncertainties will affect cash flow, profit margins, and overall investment feasibility.

The data collection methodology in this research design is divided into two distinct sources: primary data and secondary data, each serving a specific purpose in addressing the research objectives. This dual approach ensures a comprehensive understanding of the problem, combining qualitative insights from experts with quantitative data from existing documents.

The data analysis methodology employed in this research is structured to ensure a systematic, comprehensive, and reliable approach to evaluating the feasibility of the proposed facility and funding options. It integrates financial analysis and strategic decision-making tools to address the key challenges associated with the company's long-term goal of penetrating the European market.

RESULT AND DISCUSSION

Analysis Result

Garuda Project Investment

This pharmaceutical industry faces increasing regulatory challenges and financial constraints when expanding into new markets. Garuda Project is a strategic initiative by PT Asgardian Muda to build a new pharmaceutical manufacturing facility that complies with European Good Manufacturing Practices (GMP) standards.

The project originates from the strategic vision of the Board of Directors (BOD), who underscore the importance of meeting rigorous regulatory standards and aligning with global quality benchmarks. This vision leads to the decision to build a compliant facility aimed at opening access to new markets and securing sustainable business growth. Essential departments (as stakeholders) such as R&D, Production, Quality, Engineering, and Regulatory Affairs are actively involved in evaluating the facility's requirements to ensure that its design

supports both operational efficiency and full compliance with European regulatory frameworks. Here is an investment breakdown based on alignment with many stakeholders.

Table 1: Garuda Investment Cost Breakdown

		1 Jpy	112.36
No	**Description**	**Estimated Cost**	
		IDR	**Idr ==>Jpy (2024 Rate)**
	GARUDA PROJECT	900,000,000,000	8,009,996,476
	General		
A	**General project Preparation**		
	Land Purchase	47,059,402,688	418,828,500
	Fence	274,332,666	2,441,560
	Permit and Licenses	3,086,242,490	27,467,546
	Tax exemption Application	2,571,868,741	22,889,622
B	**Lead Engineering Consultancy**	-	-
	Concept Design	814,833,335	7,252,013
	Basic Design	4,479,950,407	39,871,541
	Tendering Process Consultancy	1,201,021,879	10,689,090
	Detail design Consultancy	6,058,179,473	53,917,774
	Related applicant	1,954,620,243	17,396,113
C	**Project management Construction**	-	-
	PMC Fee	13,922,382,786	123,909,152
D	**Civil Architectural Structure**	-	-
	Preliminaries	10,839,980,954	96,475,788
	Production & Warehouse	98,230,941,274	874,254,993
	Hazardous Waste Building	898,611,487	7,997,639
	Waste Processing and Destruction Room Data Sheet Building	1,154,701,236	10,276,836
	Pallet Wash Building	249,263,392	2,218,443
	External Works	6,582,048,218	58,580,203
	Pipe Rack & Pipe Bridge	1,284,241,738	11,429,746
	Waste Water Treatment Plant	5,337,362,458	47,502,505
E	**Mechanical Electrical & Plumbing**	-	-
	Bill 01 Preliminaries	13,270,143,157	118,104,222
	Production & Warehouse	125,132,919,105	1,113,682,490
	Hazardous Waste Building	588,443,568	5,237,145
	Waste Processing and Destruction Room Data Sheet Building	778,556,105	6,929,146
	Pallet Wash Building	48,899,798	435,208
	Waste Water Treatment Plant	-	-
	Waste Water Treatment Plant	6,523,443,004	58,058,617
F	**Clean Utility Support**	-	-
	Purified Water Treatment	9,415,097,088	83,794,327
	Compress Air (150 KW)	3,497,741,488	31,129,886
G	**Production Equipment**	-	-
	Dispensing Equipment	11,569,524,785	102,968,725

		1 Jpy	112.36
No	**Description**	**Estimated Cost**	
		IDR	**Idr ==>Jpy (2024 Rate)**
	Mixing backbound Product A	30,346,158,252	270,080,690
	Mixing backbound Product B	40,938,014,911	364,348,172
	Filling - Packing Backbound Product A	142,586,335,691	1,269,017,829
	Filling - Packing Backbound Product B	57,302,022,891	509,987,779
	Palletizing System	10,047,090,967	89,419,070
H	**Logistic**	-	-
	Logistic - Transport System	12,869,631,181	114,539,667
	Logistic - Racking	9,001,540,595	80,113,676
	Logistic - Racking SS	1,028,747,497	9,155,849
	Logistic - Plastic Pallets	7,201,232,476	64,090,941
I	**Laboratory**	-	-
	Microbiology (testing equipment)	14,745,380,783	131,233,831
	Analytical (testing equipment)	19,546,202,434	173,961,125
J	**Furniture and Fixtures**	-	-
	Furniture laboratory	6,515,400,811	57,987,042
	Furniture Production	2,400,410,825	21,363,647
	Furniture Lab Office	857,289,580	7,629,874
	Gowning	3,772,074,154	33,571,445
	Clean equipment Storage	3,086,242,490	27,467,546
K	**Workshop**	-	-
	Workshop Equipment	2,400,410,825	21,363,647
L	**Project Related QO**	-	-
	Qualification Validation	171,457,916	1,525,975
	Calibration	1,028,747,497	9,155,849
M	**Regulatory Affair**	-	-
	Dossier Preparation	-	-
	Registration Process	240,041,083	2,136,365
N	**Training**	-	-
	FAT Business Trip	308,624,249	2,746,755
	Management Business Trip	771,560,622	6,866,887
O	**Factory Start Up**	-	-
	Pack Material FAT	2,057,494,993	18,311,697
	Raw Material for FAT	342,915,832	3,051,950
	Raw material for startup	685,831,664	6,103,899
	Pack Material Startup	1,714,579,161	15,259,748
	Personnel for Startup	1,209,807,056	10,767,278
P	**Contingency Total**	150,000,000,000	1,334,999,413

The Garuda Project will be carried out over a period of 7 years, with the following timeline breakdown:

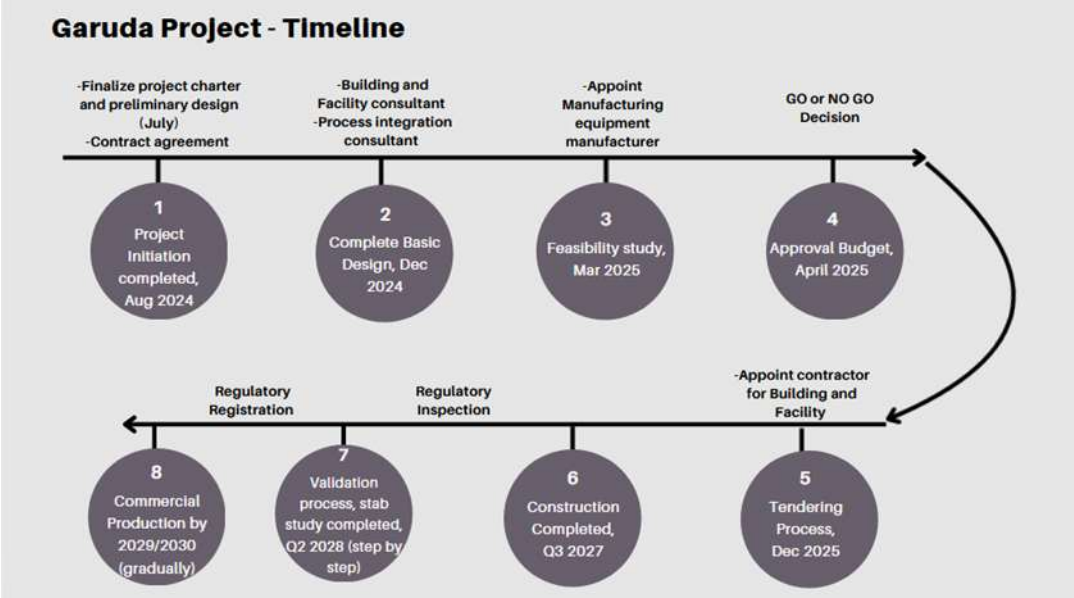

Figure 1. Garuda project timeline

Garuda Project is the initiation of headquarter company and PT Asgardian Muda to build the new pharmaceutical facility which following state of the art of technology and according to the latest GMP requirement. The Garuda Project is planned to span a total duration of seven years, beginning with project initiation and preliminary design, which are targeted for completion by August 2024. This initial phase includes finalizing the project charter, engaging in early-stage planning, and securing contract agreements. By December 2024, the project aims to complete the basic facility and process design, supported by building, facility, and process integration consultants. A feasibility study is scheduled for March 2025, followed by a "GO or NO GO" decision and the approval of the project budget in April 2025. Subsequently, the tendering process to appoint contractors for facility construction is expected to be finalized by December 2025.

Once the contractors are selected, construction is projected to be completed by the third quarter of 2027. The validation process, including stability studies will commence thereafter, with a step-by-step approach targeted for completion in the second quarter of 2028. This will be followed by regulatory inspection and registration. If all milestones are successfully achieved, the facility is expected to enter commercial production gradually between 2029 and 2030. Each phase is aligned with international regulatory expectations, emphasizing the project's goal of establishing a GMP-compliant facility capable of entering high-standard markets such as Europe. The facility should meet these requirements:

1. Garuda Project should include the manufacturing process for Liquid and semi solid product.
2. Building, facility, machinery, process including Quality operation are following latest GMP requirement (PICs / EU GMP)
3. Risk reduction of cross contamination of steroid product and non-steroid must be considered (Strong emphasis on **Quality Risk Management (QRM))**

4. Construction must be finished by the middle-of 2027 and start commercially produce by 2029.
5. Total cost of the Project is funded by PT Asgardian Muda itself (no funding from headquarter)
6. Basic design for Building and process must be available before moving to detail design
7. Detailed requirements for water quality, distribution, and microbial limits; validation is mandatory.

Garuda project will be divided into several step as follows (including Cost and Scheduling)

Table 2 Steps of Garuda Project (Cost and scheduling)

No	Steps of Project	Timeline	Estimate Cost (IDR)
1	Preliminary design (including land purchased)	2023	70,000,000,000
2	Feasibility study includes basic design.	2024	7,000,000,000
3	Detail design	2025	192,000,000,000
4	Construction	2026	194,000,000,000
5	Commissioning, Qualification, and validation	2027	429,000,000,000
6	Registration	2028	0
7	Commercial Production (gradually)	2029/2030	0

Scenario Based Financial Projection

To determine the project's financial viability, a structured feasibility analysis methodology is employed. This analysis is intended to evaluate whether the proposed investment is financially sound or whether a shift in strategic direction is warranted. Upon identifying the most appropriate funding structure for project implementation, a detailed risk assessment is conducted. This risk analysis includes sensitivity testing, ensuring a robust foundation for informed investment decisions and sustainable project execution.

1. Funding Scenario

   By using financial modeling, PT Asgardian Muda can anticipate the financial impact of different funding structures. This approach allows for a comparative evaluation of different financial scenarios, ensuring that the company chooses the most efficient and sustainable funding strategy while maintaining liquidity and minimizing financial risks. Here are funding strategy proposed:

Table 3. Scenarios Funding of Garuda Project

	Scenario funding	WACC
1	100% Equity	10.049%
2	75% Equity 25% debt	9.680%
3	50% Equity 50% debt	8.735%

WACC represents the average cost of capital a company pays to finance its assets, weighted by the proportion of equity and debt. It's used as the discount rate in Net Present Value (NPV) and other investment appraisal models. The lower the WACC, the less harsh the discounting, which results in a higher NPV.

100% equity has the highest WACC (10.049%) because equity is more expensive than debt (investors expect higher returns). In scenario 2 and 3, WACC decreases due to Tax

shield on interest payments. WACC is not just a financial figure it shapes the entire outcome of the feasibility study. Lowering WACC through a well-structured funding mix enhances the Garuda Project's financial viability on paper (NPV, IRR, payback), but must be weighed against operational and financial risks associated with higher leverage. Lower WACC means **Higher present value of cash flows, it can increase NPV and** Improves the chances of project **acceptance.** Higher WACC can decrease NPV and may make a **viable project appear unprofitable**

2. Calculation IRR & NPV

Projected revenue is needed to calculate **IRR (Internal Rate of Return)** and **NPV (Net Present Value).** The company need to evaluate how the expected cash inflows (typically derived from revenue projections) compare to the initial investment cost, accounting for the time value of money. Here are revenue projection using Compound Annual Growth Rate (CAGR):

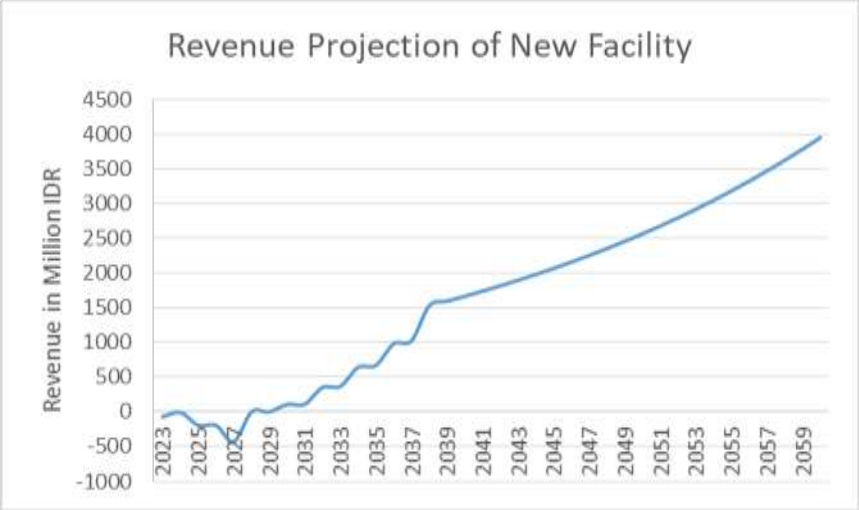

Figure 2. Revenue Projection New Facility

IRR is the discount rate that makes the Net Present Value (NPV) equal to zero. It represents the average annual return generated by a project over its lifetime. NPV is the difference between the present value of future cash inflows and the initial investment, discounted using the WACC (Weighted Average Cost of Capital). Here are calculation IRR and NPV:

Table 4. Calculation result of WACC, IRR and NPV of Garuda Project

	Scenario	WACC	IRR	NPV (IDR)
1	100% Equity	10.049%	27.14	11,013,790,289
2	75% Equity 25% debt	9.680%	27.14	14,044,765,495
3	50% Equity 50% debt	8.735%	27.14	41,049,897,677

The IRR (27.14%) is the same in all three funding structures because it depends only on the project's cash flow pattern and initial investment, not on how the project is financed. It shows that the project is expected to yield an average annual return of 27.14%. Scenario 1 (high WACC) produces a much lower NPV (IDR 11 billion). Scenario 3 (low WACC) produces a much higher NPV (IDR 41 billion). This reflects the inverse relationship

between WACC and NPV the lower the discount rate, the higher the present value of future cash flows (López-García, Martínez-Solano, & Sánchez-Ballesta, 2021).

Since IRR > WACC in all scenarios, the project is financially feasible under each funding option. The larger the gap between IRR and WACC, the more financially attractive the project becomes. Scenario 3 has the largest IRR–WACC gap (27.14% − 8.735% = 18.41%), indicating the strongest investment performance. A higher NPV means the project contributes more value to the company. Scenario 3 maximizes shareholder wealth, with NPV ~ IDR 41 billion. Scenario 3 (50% equity, 50% debt) offers the best financial outcome highest NPV and strongest IRR-WACC spread and is likely the most favorable from an investor's perspective, assuming the company can manage the financial risk associated with higher debt (Kumar, Singh, & Patel, 2019).

Practical Contributions for Indonesian Pharmaceutical Industry

These findings provide valuable policy guidance for Indonesian pharmaceutical companies pursuing global market expansion. The research demonstrates that moderate leverage can significantly enhance returns for GMP-compliant facility investments, suggesting that government policies supporting pharmaceutical industry development should consider facilitating access to debt financing for regulatory compliance projects. The framework developed here offers a replicable methodology for evaluating international expansion investments, particularly relevant for companies targeting highly regulated markets like the EU (European Commission, 2020). Additionally, the sensitivity analysis highlights the importance of regulatory approval timeline management, suggesting that policy makers should prioritize streamlining approval processes to enhance investment attractiveness in the pharmaceutical sector (Chakraborty & Bhattacharya, 2020).

CONCLUSION

Based on the comprehensive financial modeling and strategic assessment supported by stakeholder input, the feasibility study concludes that the *Garuda* Project is economically viable and supports *PT Asgardian Muda*'s long-term objectives in international pharmaceutical manufacturing. Financial feasibility is confirmed across all analyzed funding structures, with IRR exceeding 27% and positive NPV values. The project's financial attractiveness improves significantly with a 50% equity/50% debt hybrid structure, achieving the lowest WACC of 8.74%, highest NPV of *IDR* 41 billion, and shortest payback period targeting 2044. While 100% equity funding aligns with the company's conservative no-debt policy and offers maximum ownership control with minimized financial risk, it results in higher WACC of 10.05% and lower capital efficiency. Sensitivity analysis reveals that the project's financial results are highly sensitive to regulatory approval delays and market demand fluctuations, highlighting key risk factors that require active management. The strategic implications extend beyond immediate financial returns to long-term positioning in regulated markets. The 50% debt model offers optimal balance between financial performance and operational agility for European market entry, while 100% equity funding emphasizes financial resilience at the cost of efficiency. *PT Asgardian Muda* is recommended to pursue the hybrid funding model to maximize returns while maintaining acceptable risk levels, though the project remains viable under full equity financing if the company maintains its zero-debt principle.

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