



Feasibility Study for Tugboat Expansion Project Using Capital Budgeting And Sensitivity Analysis (Case Study: PT. ABC)

Bisma Dwibastyantoro

Master of Business Administration Program

ABSTRACT: The Covid-19 pandemic and the unstable geopolitical environment has highly disrupted the global economy. The turn of events affected businesses sectors differently, due the disruption of the supply chain many industries have to suffer. However, there are sectors that performed well in a very uncertain economic condition. One of the business sectors that flourish during this turbulent time is in the mining sector. The soar in demand for natural resources such as coal, nickel, and construction stones have increased the sector's operational activity drastically. Being a part of the mining industry supply chain, PT. ABC is a marine transport company that provide delivery services for the minerals by utilizing tugboats and barges. The surge of activity in the mining sector has positively impacted the company. A mining companies has queued up to acquire marine transport services, however it is quite difficult to meet the rapidly demand due to the limited number of tugboats and barges available in the market. To keep up with the market demand, PT. ABC is planning to add and additional set of tugboat and barge to its fleet.

The management's decision to acquire a new set of tugboat and barge is a sizeable investment for the company. Financial calculations such as the capital budgeting method is needed to support the management's decision for to invest in the expansion project. Therefore, the objective of this research is to utilize the crucial financial calculations to analyze whether if the expansion plan is worth pursuing.

The research results shows that the expansion project is feasible, by examining the base assumptions by the company's management. The assumptions consist of the initial investment of Rp 40.500.000.000, an annual growth rate of 8,18%, the assumption of 30 working days for the charter duration, and 10 years useful life of the asset. The project will begin in the year 2023. Furthermore, the sensitivity analysis suggests that the most influential factor for the project's NPV is the charter rate. Based on the analysis, the minimum charter rate that should be charge to the customer is Rp 834.480.000 per month.

KEYWORDS: Barge, Capital Budgeting, IRR, NPV, Payback Period, Sensitivity Analysis, Tugboat.

"I learned that life is a long and difficult road, but you have to keep going, or you'll fall by the wayside."

- Steven Rodney "The King of Cool" McQueen

CHAPTER I. INTRODUCTION

I.1 Background

I.1.1. Mining Activities in Indonesia

The coronavirus pandemic disrupted the global supply chain and hindered global economic activity (Xu,2021). Like any other industry, mining also took a substantial hit from the covid-19 pandemic. The Indonesian mining sector was forcibly stopped because China placed restrictions on their manufacturing sector to mitigate the spread of the coronavirus. Consequently, it ripples the mining sector through the Indonesian coal, nickel, and tin miners who rely on the Chinese market (Jong,2020).

In addition, another major turn of events has shifted the mining sector's market condition. Coal imports from Russia have been hindered because of sanctions that went into force on August 10, 2022 (Morrow,22). Before the war, Russia accounted for over 45% of the EU's coal imports (Morrow,22). Therefore, the EU needs to find other alternatives for the coal supplier and is one of the best alternative is Indonesia.

Indonesia is one of the countries known for its natural resources. The country covers 735,358 square miles and comprises more than 13,000 islands. About 261 million people live in this nation (Sawe, 2018). With its vast land coverage, Indonesia is one of the most



prominent nations with large mineral deposits that have not yet been explored (Sawe, 2018). The mining industry contributes between 4% and 6% to Indonesia's GDP (Asia,2020). It has been one of the country's most constant sources of inbound foreign investment and export earnings (Asia,2020). Besides being the top thermal coal producer, Indonesia is a prominent global supplier and a leading producer of copper, gold, nickel, tin, and bauxite.

I.1.2. Mining Products Transportation

Several options exist for transporting coal and other products from the mining site to the market. The transportation expenses can be enormous and account for a significant proportion of the overall price paid by the customer (i.e., Mining companies), which will affect the overall price of the mining commodity (Ramani, n.a.) . The options available for Mining companies to transport their goods are by the usage of *railroads, on-highway trucks, barges, conveyors, and ships*. However, the most economical way to transport coals or other mining products is through the usage of barges and tugboats (Ramani, n.a.).

According to Mitrahaftera Segara Sejati (MBSS), a tug and barge service provider, Indonesia's domestic barge industry is predicted to expand. The expansion is due to the increased global population, influencing the demand for coal, sand, and grains (Barge, 2020). Also, the fuel ban amidst the Russo-Ukraine war increased the need for mining products such as coal from the European market. As a result, Indonesian miners ramp up their production to fulfil this spike in demand (Mulia, Shibata, & Damayanti, 2022). As a result, this will positively increase the need for tugboats and barges to transport these mining products.

I.1.3. Demand for tugboats

The tugboat is one of the most frequent means of transporting mining goods. A tug or tugboat is a manoeuvrable ship designed to pull or push other vessels in ports, open seas, and rivers. During the conveyance of mining goods, the tug tows the barge (Coal, 2020). Towboats are crucial for companies that provide mining services because it is preferable to anticipate the potential for damage to the primary cargo vessel while it is at sea (Coal, 2020).

In addition to the tugboats, mining companies utilize the barge to transport mining products from one place to another (Coal, 2020). The barge is the primary vessel used to transport goods across waterways. The primary aspect of this vessel is its enormous hull. A barge is preferable for transporting big volumes of mining materials. The barge's sturdy and broad structure makes it an ideal choice for long-distance transportation, unlike other vessels equipped with propulsion engines. The increase in activity in the mining sector has positively impacted the maritime transport service sector.

I.2. Company Background

I.2.1 PT. ABC Scope and Business Profile

PT. ABC has been operating since 2007 as the owner and ship agent for a fleet of tugs and barges. The company is involved in offshore maritime services and the mining industry. Having a fleet of tugboats and flat top barge, PT. ABC provides a wide range of timely and dependable services, including support for mining firms, vessel assistance, and maritime logistic support services. However, PT. ABC's core business activity is chartering tugboats and barges. PT. ABC has worked closely with various companies and utilized their equipment constantly to deliver their services to the oil and mining companies. Having a competitive landscape, PT. ABC is expanding its fleet and updating its tugboat fleet by chartering and purchasing according to international standards. PT. ABC has a fleet that consists of 8 tugboats and barges that are operational. PT. ABC's main area of operation is mainly centered around Sulawesi Island.

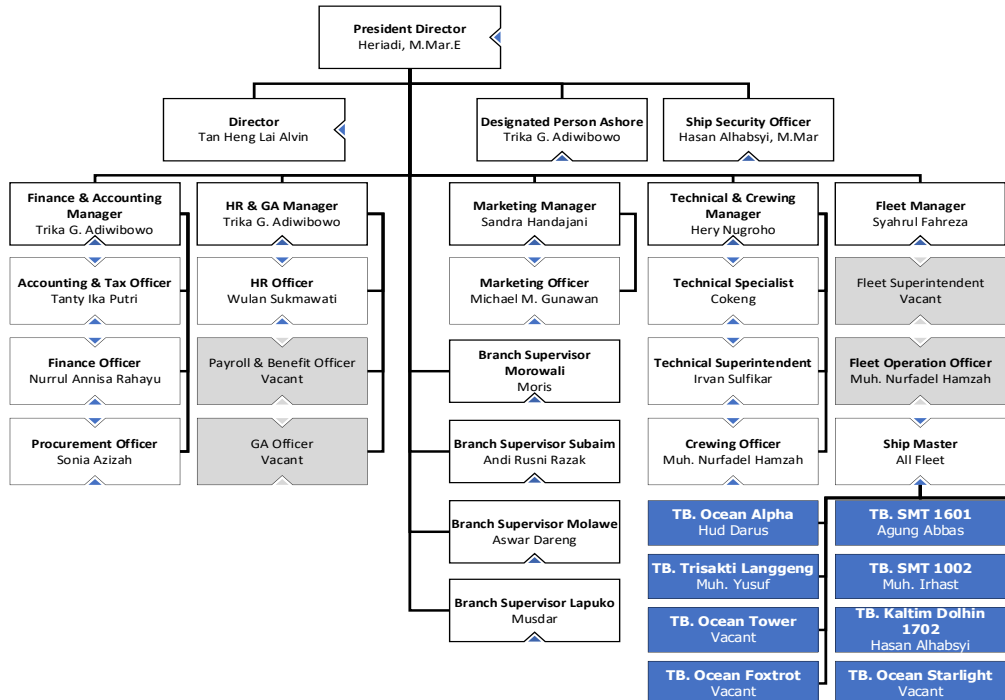


Figure I. 1 Organizational Structure of PT.ABC's

I.2.2 Business Scope and Process

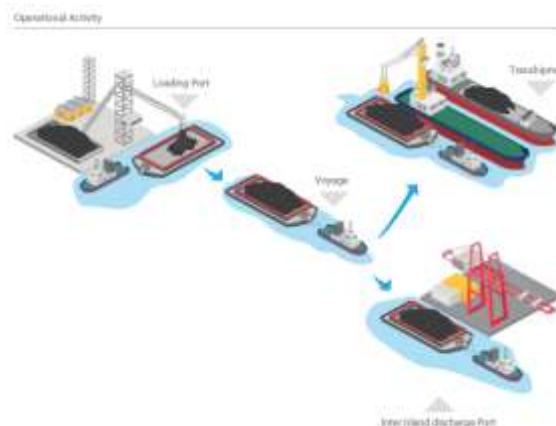


Figure I. 2 Tugboat and Barges Business Process
(Source <http://www.transpowermarine.com/img/tug-activity.jpg>)

Figure I.3 represents the business process of transporting mining products such as coal and nickel. The transporting process starts with loading the mining products from the loading port. This process is done by pulling the barge from the tugboat alongside the loading port. The number of mining products must follow the safety and prevailing regulations. After the mining produce has been loaded and deemed safe, the tugboat can leave the loading port along with the barge to the appointed port destination. In common practice, there are two leading destinations to discharge the cargo. First, the customer could have the option to discharge the mining produce onto a mother vessel. The mother vessel will wait for the tugboat to unload the cargo at the end of the river or seashore. The second option is to unload the shipment to an inter-island discharge port.

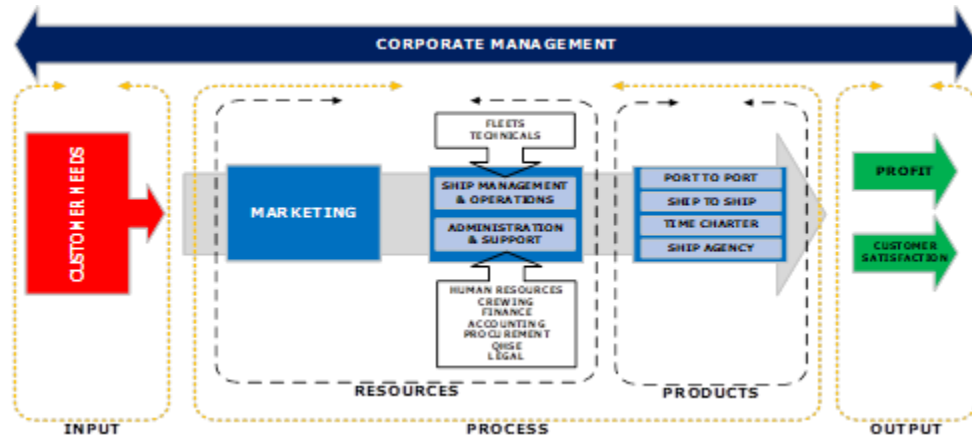


Figure I. 3 PT.ABC's Business Process

Figure I.3 Illustrates PT. ABC's overall business process. The process begins with identifying the customer needs, and it is usually done by the marketing team. Afterwards, the marketing team will communicate the needs and requirements of customer to the ship and operation division in which they are responsible for the technicalities of the operation. The ship and operation division will be supported by the administration and support team, which consist of the human resource department, finance & accounting, procurement, QHSE, and legal team. After receiving the customer's order from the marketing department, then the ship and management operation can carry out the service. PT. ABC has four different service offering, and can be identify as port to port, ship to ship, time charter, and ship agency.

I.3. Business Issue

With the current market condition, PT. ABC could not keep up with the customer demand for chartering their tugboats and barges. PT. ABC's management plans to expand their fleet of tugboats and barge from 8 to 9 vessels. The main purpose of the new set of tugboat and barges is for the time charter service offering. Therefore, PT. ABC plans to invest in a new tugboat and barge to increase the company's operational capacity. The first problem face by PT. ABC is to determine whether it is feasible for PT. ABC to expand the project. Also, the other hurdle that PT.ABC needs to overcome how to fund the expansion. One is related to the cost of funds for the investment and PT. ABC's management would like to know which funding source would be suitable to finance this project.

I.4. Research Question and Objectives

The challenges of PT. ABCs that will be analyzed in this research study:

- Does the expansion project is feasible for PT. ABC?
- Utilize Capital Budgeting method to determine the feasibility of the project.
- Utilize Sensitivity analysis to determine most influential variable to the project feasibility.

I.5. Research Scope and Limitations

This Research paper will discuss examining the feasibility of an expansion project (i.e., an increasing number of vessels) and calculating the most optimal capital structure to fund the expansion project. Analyzing and formulating the business solution will be divided into five chapters. The first Chapter will discuss the business scope of PT.ABC and identifying the business issues encountered by the company formulating a research question and objective for PT. ABC business issues. The second Chapter will further explore the business problems and construct the conceptual framework for the business to solve the difficulties PT. ABC Faces. Chapter three will discuss the methods to collect data and the research methodology and tools selected to overcome the current issue. Also, Chapter three will discuss the research design, which refers to the research's steps, starting from the problem identification until the data analysis process. Afterwards, the data that has been processed and analyzed will be further examined in Chapter 4. Chapter 4 will have the core discussion regarding the result of the research design process. This Chapter will also cover



the planned solution, implementation plan, and justification concerning PT. ABC's business issues. Lastly, Chapter five will discuss the research study's conclusion and recommendation for PT. ABC in regards to its expansion project .

CHAPTER II. LITERATURE REVIEW

II. 1 Conceptual Framework

The conceptual framework is crucial to understand the business issue and is also essential to formulate the solution(s) for the company's hurdles. The framework below will guide readers to examine the business issue and solution.

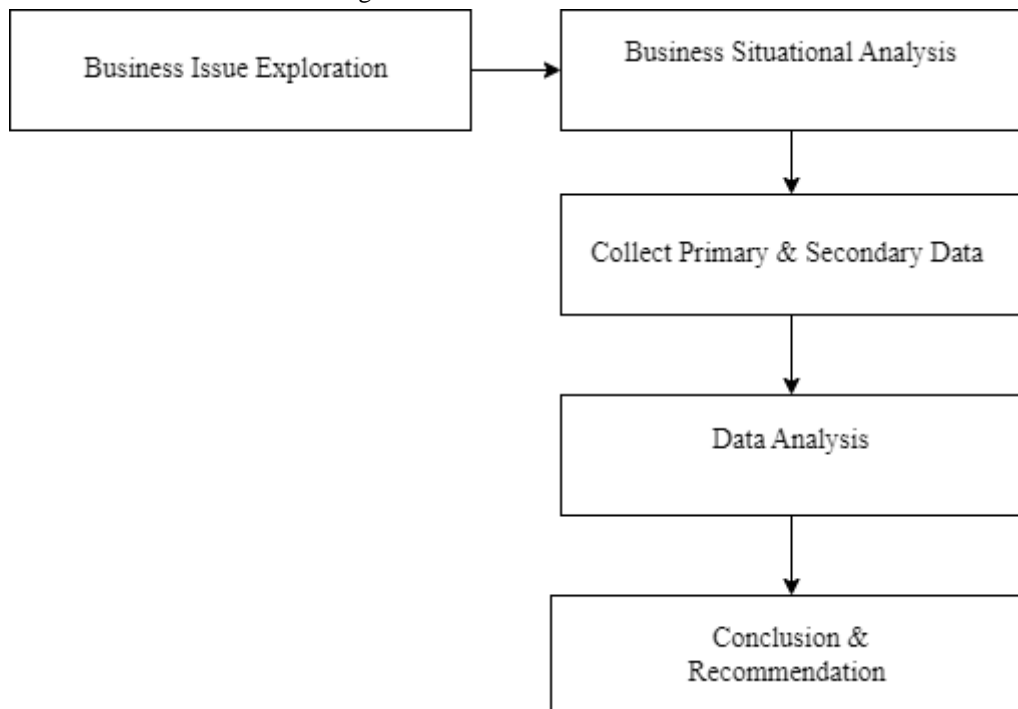


Figure II. 1 PT. ABC's Conceptual Framework

II.2 Business Situation Analysis

II.2.1 Macro Condition Exploration

In early 2020, a previously undiscovered coronavirus, referred to as the new coronavirus, surfaced in Wuhan, China. It is causing a devastating outbreak in other Chinese cities that spread worldwide. The World Health Organization (WHO) classified COVID-19 as a pandemic on March 11th, 2020. Not only has the illness become a public health emergency, but it has also harmed the worldwide economy. Consequently, it has a negative impact on the GDP of many countries, including Indonesia.

There was a decrease of 2.07% in Indonesia's GDP from 2019 to 2020. Due to the strict covid prevention policy, ten business sectors have declined their activity. The epidemic also affected the global commodities market, which experienced a decline in oil, natural gas, and coal prices. Consequently, metals and minerals had significant price decreases due to the significant demand drop (Haq, Dewi, & Et al.,2021). The spread of COVID-19 reduced coal demand in local and international markets, affecting the whole industry's supply chain (Haq, Dewi, & Et al., 2021).

However, coal prices reportedly unexpectedly increase to the highest level in a decade due to China's surge in thermal coal demand due to natural gas shortages, rising electricity use, and a lack of rainfall (Haq, Dewi, & Et al., 21). Also, several European Union countries are reverting to coal from gas power generation due to the EU's ban on importing new coal from Russia and the Russo-Ukraine war (Data,2022).

For this reason, the Indonesian government plans to increase the national coal output to 663Mt in 2020 to satisfy the demand surge from the EU and China. Many Indonesian coal mining companies have raised their output goal in line with the government's target. Therefore, Indonesia's coal mine production is anticipated to expand by 2.6% year-over-year (YOY) to reach 629.9Mt in 2022, following robust growth of 8.9% in 2021. Image 2.2. shows Indonesia's coal production forecast until the year 2026.

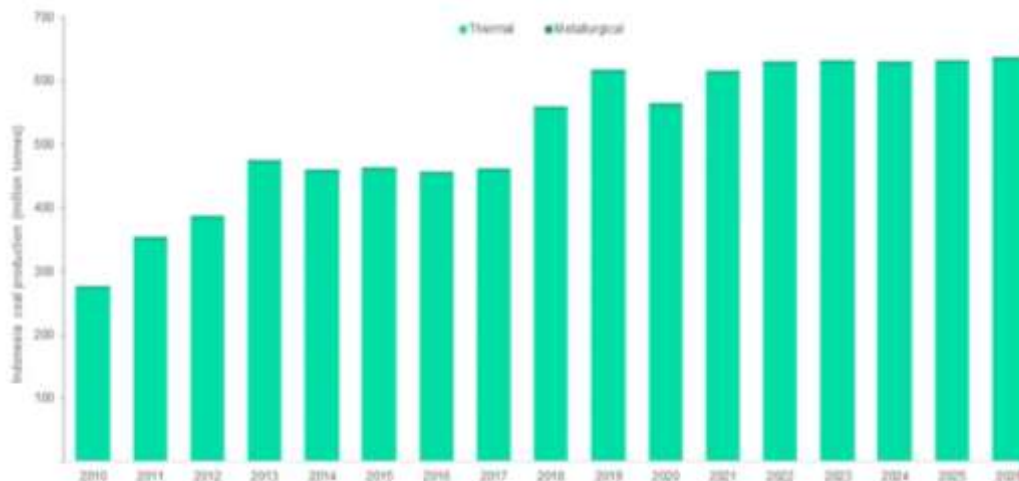


Figure II. 2 Indonesia's Coal Production Forecast

(Source <https://www.mckinsey.com/industries/metals-and-mining/our-insights/the-mine-to-market-value-chain-a-hidden-gem>)

Other than transporting coals, PT. ABC is also transporting other commodities, such as nickel. Although President Joko Widodo effectively imposed a ban on exporting nickel ore in 2020, there is still rising demand for the commodity. In order to meet domestic processing requirements for nickel ore, businesses must process or purify the raw materials in Indonesia before sending them overseas for export. However, the ban on exporting nickel ore does not negatively affect the overall industry performance.

In 2022 the demand for nickel ore in Indonesia is anticipated to soar to 100 million metric tons, a 20–30% rise from 2021 (Jiang, 2021). The rising trend for nickel is affected by the increasing demand for raw materials requirements to produce batteries for electric vehicles (EVs). In September 2021, President Joko Widodo opened a factory in the province of West Java to make batteries for electric vehicles. Furthermore, the construction of cathode precursor plants also influences the expanding demand for nickel ore (Jiang, 2021). These downstream industries provide new support for the nickel industry.

In the short term, the export restriction resulted in the loss of export earnings, jobs, and government revenues. However, Indonesia has succeeded in attracting investment in nickel processing and increasing the value of its deposits in the long run. Chinese firms have invested approximately \$30 billion in the nickel supply chain in Indonesia. The production of refined nickel products, mostly nickel pig iron for the Chinese steel industry, soared from 24,000 tons in 2014 to 636,000 tons in 2020 (Huber, 2021).

To summarize, the macro condition has positively impacted Indonesia's coal and nickel industry demand. Firstly, the geopolitical climate in the European region and China's energy shortage plays a considerable role in the soaring demand for coal from Indonesia. On the other hand, local regulations and promising EV market growth have ultimately affected Indonesia's nickel production activities. The economic condition of these mining sectors is highly influential for PT. ABC's business activity.

2.2.3 Business Process

As a part of the mining supply chain, PT. ABC has a high reliance on mining activities. Therefore, it is imperative to understand a mining industry's business process and activity to see its effect on PT. ABC business performance. One of the most significant minerals is being transported by PT. ABC is coal and nickel. Therefore, any occurrence in the global or domestic coal mining industry will determine PT. ABC's business activities. Therefore, it is essential to understand the business process of the mining industry.



Figure II. 3.Mining Industry Value Chain

Figure II.2 Illustrates the mining industry value chain. The business process starts from the mining process itself and is represented by the pickaxe icon on the further left side of the image. The next step is to process and manage the extracted minerals in the inventory. Afterward, the minerals will be displaced and moved to the nearby port via rail. When the minerals arrive at the port, the minerals will be stockpiled and loaded into a vessel. The vessel could be a ship or a tugboat, depending on the port location. If the port's location is secluded and requires passing through a network of rivers, a smaller vessel is needed to transport the goods (i.e., a tugboat and a barge). This process is the main activity of PT. ABC transports the mining products through river canals to a larger ship for the overseas market. It requires a larger vessel to transport the mining produce to a foreign market and through the open waters.

Therefore, as part of the mining business process, the demand for tugboats and barges is highly influenced by the mining industry's economic activity. In Q4 2021, it was reported that the domestic and international vessel activities are dominated by the mining sector (Prasetyo, 2021) The increase in the demand for mining products, especially coals has influenced the volume the national maritime transport (Prasetyo, 2021). This further strengthens the mining activities' relationship with the maritime transport companies.

2.2.4 PESTEL Analysis

PT ABC highly relies on the mining industry because its primary business is transporting mining produce (i.e., coal and nickel). Any external activities that influence the mining sector, will undoubtedly have a direct impact on PT. ABC's business operation. PESTEL is an acronym for *Political, Economic, Social, Technology, Environment, and Legal* is an analytical technique for businesses to discover how external factors impact their operations and make them more competitive on the market (Hall,22)

Political Factor

Political factor refers to the changes in government policy and legislation affecting the economy (Hall, 2022). In this case, due to PT. ABC's high reliance on the mining industry, domestic and international policies, and legislation related to the energy sector will have a determinant effect on the company. As a direct impact of the Russian export ban, there is a surge in demand for coal from European countries. In order to fulfil the enormous energy consumption from Europe, EU nations must revert to coal, especially for the upcoming winter months. As a result, there was a 4.1% expansion in the second quarter in the mining sector (Shofa, 2022). The restriction, effective on August 10th, 2022 has effectively garnered a trade surplus of \$15.55 billion in the same quarter of 2022, contributing to 148.01 % YoY growth (Shofa, 2022). Without a doubt, the upsurge in demand will affect the production output. Therefore, as part of the mining supply chain, it will increase PT. ABC's business activity.

Economical Factor

Economic factor refers to the factors that most likely will change following the changes in the economic environment, such as inflation, exchange rates, recession, and supply & demand (Hall, 2022). For instance, China relies significantly on resource-rich countries such as Indonesia for mineral imports. Chinese investment in Indonesia has risen significantly during the third quarter of 2022 due to increasing global demand for manufacturing-related raw materials such as coal and nickel (Jennings, 22).

Between July and September of 2022, China's foreign direct investment in Southeast Asia's largest economy totalled US\$1.56 billion. According to The Indonesian Ministry of Investments, the FDI doubled in the same period the previous year. Due to Chinese investments, Indonesia has become the world's top producer of stainless steel and other commodities related to nickel (Jennings,2022). Furthermore, the growing electric vehicles (EVs) market will influence the increase in demand for nickel ore as



one of the crucial components to build the EV's battery. Admittedly, affecting PT. ABC's business operation is due to the increase in the supply and demand of mining products.

Social Factor

The sociocultural factors can be referred to as demographics, consumer attitudes, purchasing patterns, rates of sociocultural changes, and living standards of a market. These external sociocultural factors influence the coal market (Hall, 2022). The strength of societal standards against pollution and environmental degradation in the mining industry impacts the mining sector. For instance, if a nation's citizens place a high value on cleanliness, they are more likely to fight against mining's contribution to environmental damage, especially in developed countries. In a survey commissioned jointly by the European Parliament and Commission, 26,530 respondents from all 27 EU member states were questioned on topics ranging from citizenship to renewable energy. An astounding 88% of respondents wanted renewable energy to become a more significant portion of Europe's GDP (Open access, 2022).

When burnt, coal releases much more climate-warming greenhouse gases than natural gas, which is why many European countries utilize gas as an energy source (Singh, Brenstein, Hopton, 2022). However, desperate times calls for desperate measure. Europe's return to coal is a response to Russian gas cutbacks. As a subtropical continent, people in the EU will have to rely on some form of heating during the winter. Germany and a handful of its European neighbours are temporarily reverting to coal-fired power facilities to preserve natural gas reserves. Therefore, this results in the soaring demand for coal to electrical power facilities for the winter.

Technology Factor

The technological factor refers to how technological change influences a market activity (Hall, 2022). In this PESTEL evaluation of the mining business, the technological environment is also a critical concept to identify. The technology could increase the mining firms' efficiency and effectiveness in their operational activity (David, n.a). Tugboats are one of the most prominent technologies in the mining industry. With extreme accuracy and speed, large vessels such as ships, barges, and oil rigs can be pushed or towed by tugboats. The maritime sector may realize significant financial savings with an increase in the efficient use of tugboats and on-time cargo delivery (Balakrishna & Sasi, 2016). With, maritime delivery services offered by PT. ABC is impactful for a mining company's business process.

Environmental

The environmental factors refer to Important considerations, including the rising scarcity of raw materials, pollution standards, ethical and sustainable corporate practices, and carbon footprint targets (Hall, 2022). The mining industry is one of the most polluting business activities in the world. It is responsible for several environmental problems, including polluting water sources, land deterioration, and air pollution (David, n.a.). Environmental rules in a nation significantly impact the mining sector in two ways. Firstly, environmental rules impact the mining business. They first decide which technologies apply to the mining industry. Second, they determine which mining sector operations are permitted (David, n.a).

Related to sociocultural factors, The EU has commissioned an ambitious plan to phase out fossil-based energy sources such as coal in 2038. The European Commission created the "*Renewable Energy Directive*", this directive serves as a legal framework for the development of renewable energy across all of the European Union member's economic activity (European Commission, n.a.). Coal contributes to around 20% of the EU's overall electricity output. The transformation to cleaner sources of energy and new technologies, such as carbon capture and storage, is essential if the EU is to reach its commitments to decrease CO2 emissions by at least 55% by 2030 and to become the world's first climate-neutral union by 2050 (European Commission, n.a.).

Furthermore, The Indonesian Government has a similar agenda for the Indonesian mining practice through The Indonesian Directorate General of Mining and Coal, commonly known as ESDM. Collaborating with *The Indonesian Coal Mining Association*, the government is supporting the *Good Mining Act* to promote sustainability in the industry (ESDM, 2021). With the assumption of going concerned, PT. ABC must have the ability to adapt to the changing market demand and conditions. Currently, the livelihoods of PT. ABC is highly dependent on the mining industry. So, PT. ABC needs to find other revenue sources other than delivering coal and mining products.

Legal

This factor analyses the legal factors that impact companies, including consumer law, copyright law, and health and safety regulations (Hall, 2022). Special restrictions, such as pollution and environmental protection regulations, apply to the mining sector. Similarly, mining businesses must adhere to standard employment and industrial practices requirements.



Regulation No: 644. K/30/DJB/2013, which governs the procedure to determine the benchmark for cost adjustment for coals, was imposed by the Energy and Mining Ministry. In the regulation, there was a change in the price benchmark adjustment for freight costs. Regulation No: 644. K/30/DJB/2013 illustrates that the mining and energy sector is highly regulated. Also, The nickel strategy of Indonesia is a component of the nation's commodity-driven development strategy. The Mineral and Coal Mining Law (Law No. 4/2009) guides the country's overall policy, frequently referred to as "resource nationalism." It is tied to Article 33 of Indonesia's 1945 constitution, which declares that land, water, and natural resources are under state authority and must be utilized for the greatest good of the people.

2.2.3 Porter Five Forces Analysis

Michael E. Porter's Five Forces Model analyses the factors contributing to a company's competitiveness and helps determine its strengths and weaknesses (Hall,2022). Porter's 5 Forces identify competition, new entrants into the industry, supplier power, buyer power, and the threat of substitute products and services in the market (Hall,2022).

a. Industry rivalry (high)

Industry rivalry refers to the competition between existing players within an industry. Increased competition diminishes the strength of competing businesses. When competition is minimal, businesses may do whatever is necessary to boost profits (Hall, 2022). Attributable to the fact that the profit margin in the shipping sector is very substantial, there are many players in this industry. Since industry expansion is rapid, the probability of leaving the industry is low. One of the reasons is that the customer lacks awareness of the players, which makes it challenging to acquire new clients. Therefore this makes the industry rivalry in the shipping service quite high, mainly in the tugboat and barge service.

b. Threat of New Entrants

The threat of new entrants is moderately low-medium. The low to medium threat is because the setup cost for a marine transport business is considerably high. The cost of acquiring a tugboat range from \$750,000 up to \$10,000,000 or Rp11,680,800,000.00 up to Rp 155,744,000,000.00 (Damco,2021). So, new players must have access to a considerable amount of Capital, resulting in high capital requirements to start the business.

c. Threats of Substitute

Substitutable products and services from a competitor also pose a risk to a company's profitability (Hall,2022). The substitution threat results from a shift in buyer behavior toward a rival or away from the organization. Changes in the quality of service, a rise in freight prices, or an increase in transit time may also result in substitution. If there is a delay in service or a decline in quality, and the freight charges remain comparable, customers will switch to the new alternatives. If the price of oil skyrockets, the corporation will be forced to raise transportation fees. Due to rising shipping costs and longer delivery times, buyers will opt for alternatives such as airlines, trucks, or even the freight train.

However, two factors lower the threat of consumers switching to an alternative transporting mode. First, because most of the end-users of coal and nickel are in Europe and China, it would be costly to deliver the goods by air. Also, it is quite inefficient and impossible to deliver mining through the use of trucks and trains. Secondly, the mining site is located in remote areas that only tugboats and barges can access. Hence, for these two reasons, the threat of buyers switching to an alternative mode of transportation is low.

d. Bargaining power of Supplier

This factor explores how suppliers would utilize their market position to raise prices—the fewer vendors on the market, the greater their market power (Hall, 2022). Suppliers have little impact on companies engaged in the shipping line industry, particularly the dominant shipping corporations. While it may impact small players attempting to establish themselves in the market, the impact will be minimal. Shipping companies receive fuel oil, lubrication oil, fresh water, paints, and maintenance services from many suppliers. The supplier bargaining power can be analyzed as follows: The number of suppliers in the industry is high, the price as a factor of the supplier is high, the profit of the supplier is high, the switching cost for the supplier is high, and the supplier operational cost is high. From the analysis, it can be concluded that the overall bargaining power of the supplier is considerably low

e. Bargaining power of buyer (High)

The buyer is perhaps the most influential aspect of the shipping line industry. The shipping industry is driven by two primary factors: pricing and service quality. Price refers to the freight cost at which a shipping firm decides to move one container from one location



to another. Due to this industry's high level of competitiveness, the buyer's negotiating power regarding freight pricing has increased. Therefore, the buyer has a high bargaining power against the shipping companies.

II.3 Literature Review

II.3.1 Feasibility Study

A feasibility study is intended to support decision-makers in determining the likelihood of success for a proposed project or investment. It covers both the known expenses and the anticipated economic benefits from a project or investment (Kenton, 2022).

II.3.2 Cost of Capital

Cost of Capital refers to the cost an organization incurs from its financing activities. It is the minimum rate of return that an organization must earn to increase its value. To further elaborate, the cost of Capital shows the expected average future cost of funds over a period. The cost of Capital also exhibits an organization's financing activities. It shows how the organization raises money to fund its projects or/and investments through debt financing, equity financing, or a blend of Debt and equity financing (Kenton,2021).

1. Cost of Equity

The cost of equity is the required rate of return for a firm to determine if an investment meets its capital return criteria. As a capital budgeting hurdle for the required rate of return, it is frequently used by businesses (Kenton,2021). Every discounted cash flow model requires the cost of equity as a major input. It is difficult to assess since it is an implicit cost that might vary substantially amongst investors in the same firm (Damodaran ,2014). The cost of equity is the rate of return a company needs to pay to equity investors for financing an investment or project (Kenton,2021). There are two formulas that can be utilized to calculate the cost of equity, however this research only utilizes the Capital Asset Pricing Model (CAPM). The equation for the CAPM is as follows:

$$r_e = R_f \times \beta(R_m - R_f)$$

Where,

R_f = Risk- free rate

β = Equity beta

R_m = Annual rate of the market

2. Cost of Debt

In a finance concept, *Debt* refers to the amount of money borrowed from one party to another (James,2022). The cost of debt refers to the interest rate a company must pay on its debt. Furthermore, the cost of debt is classified into two categories: *pre-tax cost of debt and after-tax cost of debt*. (Johnson,22)

$$r_i = r_d \times (1 - T)$$

Where,

r_i = After-tax cost of debt

r_d = Pre-tax cost of debt

T = Tax rate

3. Synthetic Cost of Debt

Few companies have decided not to be or are not rated, this implies to smaller and private firms. When the rating for this unavailable to estimate said private or small firms cost of debt. There is other method such as the synthetic cost of debt. This method is estimating the synthetic rating of a smaller or private firm. This method is an alternative to substitute the role of rating agencies in assigning the appropriate rating for a firm based on the firm's financial ratios. The calculation begins by estimating the firms interest coverage ratio and assign the result with default spread rating classes. Table II.1 illustrates the interest coverage ratio results along with the ratings and default spread for each class. After the synthetic rating has been identified, then it can utilize to calculate the pre-tax cost of debt by adding the default spread to the country's risk-free rate and default risk. The details of the calculation are as follows:

$$\text{Synthetic Pre - Tax Cost of Debt} = \text{Country's Risk Free Rate} + \text{Country's Default Risk} + \text{Compny's Spred}$$



Table II. 1 Interest Coverage Ratio and Ratings: For Small Cap Firms

<i>Interest Coverage Ratio</i>	<i>Rating</i>	<i>Spread</i>
> 12.5	AAA	0.75%
9.5 - 12.5	AA	1.00%
7.5 - 9.5	A+	1.50%
6 - 7.5	A	1.80%
4.5 - 6	A-	2.00%
3.5 - 4.5	BBB	2.25%
3 - 3.5	BB	3.50%
2.5 - 3	B+	4.75%
2 - 2.5	B	6.50%
1.5 - 2	B-	8.00%
1.25 - 1.5	CCC	10.00%
0.8 - 1.25	CC	11.50%
0.5 - 0.8	C	12.70%
< 0.5	D	14.00%

4. Weighted Average Cost of Capital (WACC)

A firm's cost of capital is represented by its weighted average cost of capital (WACC), which assigns a proportional weight to each category of capital. WACC is frequently used as a benchmark rate by businesses, investors, creditors to determine the viability of a certain project or purchase. In discounted cash flow analysis, WACC is utilized as the discount rate for future cash flows (Hargrave, 2022). When calculating WACC, the cost of each capital source which are debt and equity is multiplied by the relevant weight by market value, The WACC shows what the average cost of capital is expected to be in the long run. It is found by giving each type of Capital a weight based on how much of the firm's capital structure comprised. The characteristics of an optimal capital structure is having a minimize weighted average cost of capital (WACC), as a result it can maximize the firms value (Gitman & Zutter, 2015).

$$WACC = (w_i \times r_i) + (w_p \times r_p) + (w_s \times r_r \text{ or } n)$$

- w_i = Proportion of long-term debt in capital structure
- r_i = Cost of Debt
- w_p = Proportion of preferred stock equity in capital structure
- r_p = Cost of preferred stock
- w_s = Proportion of common stock in capital structure
- r_r = Cost of retained earnings
- r_n = Cost of common stock

II.3.3 Capital Budgeting Theory

Capital Budgeting is a framework to identify and evaluate capital projects where the project's cash flow will be received over more than a year. Furthermore, the capital budgeting framework can analyze a firm's corporate decision and the impact on future earnings. There are several uses of capital budgeting projects: *replacement projects, expansion projects, new products, market development, mandatory projects, and other projects* (Gitmant & Zutter, 2015).

The capital budgeting framework has five implicating principles, which are:

1. Decisions are based on cash flow
1. Opportunity cost is a basis for cashflows



2. The timing of cashflow important
3. Cashflows are analyzed on an after-tax basis
4. The cost of financing is reflected in the project's required rate of return.

II.3.4 Types of Cashflow

1. Initial Investment

The initial investment for a project at time zero is refer to initial cash outlay (Gitmant & Zutter, 2015). The equation for the initial cash investment is stated as:

$$\text{Outlay} = FCInv + NWCInv$$

Where,

FCInv = Investment for new Fixed Capital

Nwcinv = Investment for Net Working Capital

2. Annual After-Tax Operating Cashflow

The annual after-tax operating cashflow is the incremental after-tax cash inflow as a result of implementing the project or investment (Gitmant & Zutter, 2015). A company can begin it's project activity occurs after the initial invesment outlay. Then the project can produce cash inflow (revenue) and outflows from ongoing period of the project, and because the project acquire a new fix asset for the activity there will be depreciation expenses associated with the the fix asset. Through the income statement, the depreciation will gradually decrease the asset's overall value. Furthermore, the depreciation expenses also function as a tax-shield for the company, it reduces the company's tax liability. Therefore, as an non-cash expenses analyst must add back depreciation to the after-tax profit to examine the operating cashflow in that period (Clayman,2012). The annual after-tax operating cash flow can be identify as follows:

$$CF = (S - C - D)(1 - T) + D$$

Where,

S = Sales

C = Cash operating Expenses

D = Depreciation Expenses

T = Tax rate

3. Terminal year after-tax nonoperating cashflow

When the fixed asset investment has been completely depreciated throughout the project Lifecycle, it will still generate cash inflow if the investment still have residual resale value (Keat et. Al., 2011). The formula for the terminal year after-tax non-operating cashflow can expressed as

$$TNOCF = Sal_T - NWCinv - T(Sal_T - B_T)$$

Where,

Sal_T = Cash proceeds from the sale of fixed capital on the termination date

B_T = Book value of fixed capital on the termination date

T = Tax

4. Free Cashflow to Firm (FCFF)

Free cash flow to the firm (FCFF) is the cash flow from operations that is available for distribution after depreciation charges, taxes, working capital, and investments are accounted for. FCFF measures the profitability of a company after all expenses and reinvestments. A positive FCFF score indicates that the company has cash remaining after expenses, whereas a negative FCFF value indicates that the company has not earned enough income to pay its expenses and investment activities (Hayes, 2022). The equation for the FCFF can be identify as follows:

$$FCFF = CFO + (IE \times (1 - TR)) - CAPEX$$

CFO = Cash Flow From Operations

IE = Interest Expense



$TR = Tax$

$CAPEX = Capital\ Expenditure$

6. Free Cashflow to Equity (FCFE)

Free cash flow to equity represents the amount of cash accessible to equity shareholders after expenses, reinvestment, and debt obligations are repaid. FCFE is a measure of the use of equity capital (Kenton, 2021).

$$FCFE = Net\ income - (Capital\ Expenditure - Depreciation) - Change\ in\ Non - cash\ Working\ Capital \\ - (Prefer\ Dividends + New\ Preferred\ Stock\ Issued) + (New\ Debt\ Issued - Debt\ Repayments).$$

7. Discounted Cash flow

The discounted cash flow (DCF) approach calculates the value of an investment based on its expected future cash flows. The DCF analysis seeks to calculate the present value of an investment based on forecasts of the investment's future cash flow. If the DCF is more than the present cost of the investment, the opportunity may be profitable and yield positive returns. Typically, companies utilize the weighted average cost of Capital (WACC) as the discount rate since it accounts for the projected rate of return for shareholders (Fernando, 2022).

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \frac{CF_n}{(1+r)^n}$$

Where:

CF_1 = The cash flow for year one

CF_2 = The cash flow for year two

CF_n = The cash flow for additional years

r = The discount rate

II.3.5 Net Present Value

Net present value (NPV) refers to the sum of the present value of all the expected incremental cash flows if a project is undertaken. The company's cost of Capital is utilized as the discount rate. A project with a positive NPV is predicted to increase shareholders' wealth. On the contrary, a negative NPV will decrease the shareholders' wealth (Gitman & Zutter, 2015).

$$NPV = \sum_{t=1}^n \frac{CF_t}{(1+r)^t} - CF_0$$

Where:

CF_0 == initial investment outlay (a cash outflow)

CF_t = after-tax cash flow at time t

r = Discount rate

NPV has its own decision criteria for *accept-reject* the project. If the NPV of the project is greater than \$0, the company will earn a higher return than the cost of Capital. As a result, higher earnings will increase the company's market value (Gitman & Zutter, 2015). The decision criteria are as follows:

- *Accept the project if the NPV is greater than 0.*
- *Reject the project if the NPV is less than 0.*

II.3.6 Internal Rate of Return

The internal rate of return, or IRR, is the discount rate to calculate the present value of the expected after-tax cash inflow (Gitman & Zutter, 2015).

. The equation of IRR is as follows:



$$NPV = \sum_{t=1}^n \frac{CF_t}{(1 + IRR)^t} - CF_0$$

The IRR calculation is utilized as a decision criterion or simply to make an *accept-reject decision*, The decisions are as follows:

- *Accept* the project if the IRR is *greater than* the discount rate/cost of Capital ($IRR > r$).
- *Reject* the project if the IRR is *less than* the discount rate/cost of Capital ($IRR < r$).

II.3.7 Payback Period

The payback Period refers to the number of periods it takes to recover the initial cost of an investment (Gitman & Zutter, 2015).

$$\text{Payback Period} = \text{Full years until recovery} + \frac{\text{Uncovered cost at beginning of recovery year}}{\text{Cash flow during recovery year}}$$

II.3.8 Profitability Index

The profitability index (PI), also known as the value investment ratio (VIR) or profit investment ratio (PIR), is an index that shows how the benefits and costs of a proposed project are related. It is estimated as the difference between the project's initial investment and the present value of predicted future cash flows. A project will be deemed more attractive if its PI is higher than 1 or $PI > 1$ (Chen, 2022).

$$PI = \frac{\sum_{t=1}^n \frac{CF_t}{(1+r)^t}}{CF_0}$$

II.3.9 Sensitivity Analysis

Sensitivity analysis is a financial framework that determines how changes in other factors, known as input variables, affect target variables. It is a method for predicting the result of a decision based on a set of variables (Kenton, 2022). Sensitivity analysis can be useful in a variety of circumstances, such as forecasting or predicting as well as determining whether a process modifications or adjustments are required (Maverick, 2019).

II.3.10 Capital Structure

Capital structure is one of the most complex subjects in financial decision-making. Gitman & Zutter (2015) stated that determining a company's capital structure is due to "its *interrelationship* with other financial decision variables". Poor capital structure planning may lead to a high cost of Capital, which lowers the NPVs and makes them unacceptable (Gitman & Zutter, 2015). On the contrary, having an optimal capital structure will lower the capital cost and consequently increase the project NPVs. Ultimately, higher NPV will increase the chance of more acceptable projects (Gitman & Zutter, 2015). There are two types of Capital, which are *debt capital* and *equity capital*.

II.3.11 Source of Funding

In order to grow companies into new markets or areas, corporations frequently require external finance or cash. Moreover, while corporations intend to utilize revenues from continuing business operations to finance such activities, seeking out external lenders or investors is frequently preferable. Rising Capital is achieved by retained earnings, borrowed capital, and equity capital (Estevez, 2022).

1. Internal source

In general, businesses exist to generate a profit by selling a good or service. This represents the most fundamental source of Capital for every business and, ideally, the principal technique through which the company generates revenue. Retained earnings (RE) refer to the net income remaining after costs and obligations have been met (Estevez, 2022). Retained earnings are significant since they are not distributed to shareholders in the form of dividends. When corporations earn more the retained earnings will rise, allowing company to have access to a more sizeable pool of money. When corporations pay higher dividends, retained earnings decrease (Estevez, 2022). These cash from retained earnings can be invested in project and utilized to expand the firm.

2. Debt

Debt Capital or debt financing is rising Capital from selling debt instruments to individual and/or institutional investors. As compensation for lending money, the individual and institutional investors become *creditors* and will receive principal payments



and interest on the debt (Chen,22). The cost of debt is the lowest compared to other financing options (Gitman & Zutter, 2015). Creditors seek substantially lower returns since they assume the least risk of all long-term capital providers. Also, Lenders have a higher priority in claiming any earnings or asset available for payments. This is done by exerting legal pressure against the company to pay the debt holders before the preferred and common stockholders (Gitman & Zutter, 2015). Lastly, interest in the loans is tax-deductible, substantially lowering the debt cost (Gitman & Zutter, 2015).

3. Equity

Equity is the value distributed to the company's shareholders when the assets are sold, and all obligations have been met. Equity can also be defined as the amount of ownership in a company or asset after all debts related to that asset have been subtracted (Fernando, 2022).

II.4 Current Research

Table II. 2 Literature Review of Current Research

No	Research Title	Author	Finding
1.	Investment Valuation of Tugboat and Barge Using the Capital Budgeting and Freight Rate Sensitivity Analysis	Almira Yuvita (2018)	This research utilizes industrial analysis, capital budgeting, sensitivity analysis of the freight rate to determine feasibility of the target company' project.
2.	Capital Budgeting Analysis of New Outlet Kopi Lain Hati	Meriezka Isabel Natasya (2020)	This research carries out a feasibility study for Kopi Lain Hati outlet expansion plan using the capital budgeting analysis.
3.	Studi Kelayakan Investai Pembelian Kapal Tongkang CV.Surya Samudra Sentosa	Tomy Fitrio (2018)	This research carries out a financial feasibility study for CV Surya Samudra Sentosa expansion by utilizing Net Present Value (NPV), Benefit Cost Ratio (B/C), and Internal Rate of Return (IRR).

CHAPTER III. RESEARCH METHODOLOGY

III.1 Data Collection

As a non-public listed company, PT. ABC do not publish internal data such it's financial report to any open-source platform. Therefore, this research study is quantitative descriptive research that utilize primary data. The primary data collection is done through an interview with PT. ABC's financial manager, who have the responsibility of foreseeing the project development. The primary data that is collected from PT. ABC are the company's financial statements, list of the Capital Expenditure (*Capex*), and Operational Expenditure (*Opex*) related to the investment project. In addition, this research also gathers supporting data from secondary sources such as journals, books, and publicly available financial reports.

III.2 Research Methodology

This research study is solving PT. ABC's business issues through a process of a quantitative research. The quotative techniques used in this research is intended to analyze the feasibility of the investment project through the utilization of the Capital Budgeting method. The research process starts from collecting relevant data for the calculation. The analysis begins with creating the investment project's cash flow stream, which exhibits the project's cash outflows and inflows. So, it is imperative to have the necessary list of expenditures to determine the cash outflows and inflows. Also, the cash flow stream needs to be adjusted to the appropriate time horizon from monthly to annually. Then the cost of equity and cost of debt needs to be calculated to determine the WACC so it could be use as the discounting rate for the capital budgeting calculation. After constructing the cash flow and calculating the WACC, this research can conduct the feasibility analysis utilizing the capital budgeting by calculating the Net Present

Value (NPV), Internal Rate of Return (IRR), Payback Period, and the Profitability Index (PI). Lastly, the research will also conduct a risk analysis by utilizing a sensitivity analysis and scenario analysis.

III. 3 Research Design

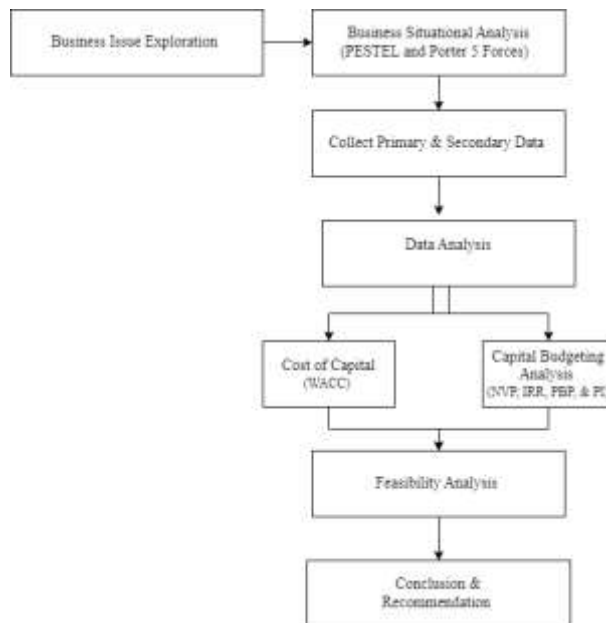


Figure III. 1 Research Design Flow Chart

The research study analyze the feasibility of PT. ABC's expansion project. This study utilizes The Capital Budgeting method to assess the viability of PT. ABC's expansion investment project. The data that being examine for this research study is primary data gathered directly from PT. ABC. Then, the analysis will calculate Cost of Debt, Cost of Equity, Weighted Average Cost of Capital (WACC). The WACC is crucial to determine the discounting rate for the project's capital budgeting analysis. Afterwards, the research will create a cashflow projection based on the project's lifecycle. After constructing the project's cashflow, the research will analyze the feasibility of the project by employing capital budgeting analysis tools such as the Net Present Value (NPV), Internal Rate of Return (IRR), Payback Period, and Profitability Index for the investment project. These financial tools will be the basis for the recommendations of the feasibility of the investment project.

CHAPTER IV. BUSINESS SOLUTIONS

IV.1 Analysis

As stated in the previous chapter, this research study is going to support the firm's decision to invest in one set of tugboats and barges. To support the management decision this research will utilize several financial calculations and tools, and the research of the analysis shown below:

IV.2 Capital Budgeting Analysis

This section will examine the solution proposed in the previous chapter. This part examines PT. ABC's cost of capital, income statement projection, cash flow projections, and the projects feasibility analysis. All calculation and analysis are dictated using the Indonesian Rupiah and in a full amount. Also, all of the calculations has been adjusted from monthly amount to an annual amount.



IV.2.1 Cost of Capital

Table IV. 1 Cost of Equity Calculation

Risk Free rate (10 Year Government bond)	6,96%
Indonesia Market Risk Premium (rm-rf)	6,12%
Leavered Beta	0,74
Cost of Equity	11,50%

(Source: Analysis, 2022)

Figure IV. 1 Synthetic Cost of Debt Calculation

Sythetic Pre-tax cost of debt =	Risk free rate + Default Spread	
=	6,96%	+ 1,50%
=	8,46%	
Cost of debt = risk free rate + Indonesia default risk + company default spread		
=	6,96%	+ 1,88%
=	10,34%	+ 1,50%

Table IV.2. Cost of Debt Calculation

Tax	25%
Pre -tax synthetic cost of debt	10,34%
After-tax synthetic cost of debt	7,75%

(Source: Analysis, 2022)

Table IV. 3 Weighted Average Cost of Capital (WACC) Calculation

Weight of equity	85%
Cost of equity	11,50%
Weight of debt	15%
Synthetic-Cost of debt after tax	7,75%
WACC	10,93%

(Source: Analysis, 2022)

Table IV. 1, IV.2, and IV.3 illustrates the computation of PT. ABC’s cost of equity, cost of debt, and finally the weighted average cost of capital (WACC). It is imperative to calculate the WACC because it will be use as a discount factor for the income statement, cashflow projection, and ultimately for the project’s feasibility analysis.

Firstly, by utilizing CAPM method mentioned in the literature review, PT. ABC’s has cost of equity of 11,50%. To calculate the cost of equity, this research utilizes the 10-year Indonesian government bond as the risk-free rate which is 6,98%. Furthermore, the risk-premium for the CAPM calculation is from the country’s risk premium of 6,12%, and a beta of 0,74.

On the other hand, to determine the cost of debt of PT. ABC, this research utilizes the Synthetic cost of debt calculation method. The first step of calculating the cost of debt is for the researcher is to calculate the interest coverage ratio. Based on the calculation, PT. ABC have interest coverage ratio of 8,69. According to the rating classification PT. ABC can be categorized into the A1/A+. Referencing to the ratio classes, PT. ABC is classified to have a 1,50% default spread. The next step is to calculate the synthetic cost of debt by adding the company’s default spread with the Indonesia’s risk-free rate of 6,69% and Indonesia’s default risk of 1,88%. The calculation will be resulted in a pre-tax synthetic cost of debt of 10,34%. Finally, after adjusting the pre-tax cost of debt with the corporate tax of 25%, the computation resulted an after-tax synthetic cost of debt of 7,75%.

After calculating both the cost of capital and cost of debt. This research needs to determine PT. ABC capital structure, which the composition comprise of 85% equity and 15% debt. After calculating both the cost of debt and the cost of equity PT. ABC yielded a WACC of 10,93%.



IV.2 Project’s Cashflow Projection

Table IV. 4 Investment Project Assumption

No	Initial Outlay	Total
Fixed Capital		
1		Rp16.000.000.000
2		Rp24.500.000.000
Working Capital		
1		Rp53.000.000
2	Estimated Document for Fleet	Rp15.000.000
Total Initial Outlay		Rp40.655.500.000
Operational Assumptions		
1	Time Charter Growth Rate	8,08%
2		4,04%
3	Earning per month from charter rate	Rp 1.043.100.000
4	No days of charter	30 days

(Source: PT. ABC and Analysis, 2022)

The income statement forecast is estimating the financial performance of PT.ABC’s tugboat and barge shipping business activity. The financial projection consists of the revenue, operational expenses, and net operating profit after-tax basis in accordance with the project’s lifecycle of 10 years.

The revenue of the project is derived from the monthly charter rate of Rp 950.000.000,00 with 30 days working day charter. The monthly charter rate is expected to grow by 8% each year for the next 10 years. Due to insufficient data from PT. ABC, this research utilized the comparable approach to determine the revenue growth rates. The research analyzed MBSS.JK, PSSI.JK, and TPMA.JK’s revenue from 2018-20221. Figure IV. 2 illustrates the calculation of the comparables revenue growth.

Inflation plays a significant role in the increase of the yearly charter rate because inflation have a direct impact on the cost associated with the necessary supplies such as the rising fuel price. Also, the other source of revenue for this project is the 11% VAT tax and Tax Art 15 of 1,2% from the charter price that will be charged to the customer.



Figure IV. 2. Revenue Growth Comparables

Revenue				
Year	2018	2019	2020	2021
MMBS.JK	75.377	77.841	54.863	73.405
PSSI.JK	63.564	75.325	68.355	108.734
TPMA.JK	43.874	47.689	39.762	42.016
Revenue Growth YoY				Average
n.a	3%	-30%	34%	3%
n.a	19%	-9%	59%	23%
n.a	9%	-17%	6%	-1%
Total Average				8,18%

(Source: Analysis, 2022)

On the other hand, cost refers to the monthly operational expenses of one set of tugboat and barges. The operational cost consists of the crew wages, estimated document for fleet fee, meals for the crews, lubricant & maintenance expenses, monthly docking expenses, and 11% VAT charge. All the operational expenses are also expected to grow according to the inflation rate of 4,04% for the next 10 years. Also, the calculation will include the tax of 25%. The depreciation expense for the new fixed asset is utilizing the straight-line depreciation method and is illustrated in figure.IV.1. The residual or selvage value of the fixed asset is calculated from 50% of the asset’s aquation cost. Therefore, the project will have a constant annual depreciation expense of Rp 2.025.000.000.

Comparables Cost Analysis

PT. ABC's cost items represent the operational expenses that are necessary for the efficient and effective management of the fleet. Crew wages refer to the salaries and allowances paid to crew members, which can vary based on factors such as fleet size, experience, and voyage duration. The estimated document for fleet represents the estimated cost of necessary documentation for the fleet, which includes certificates, licenses, and permits. Meals reflect the cost of providing food for crew members during voyages, which can depend on the type of fleet, voyage duration, dietary requirements, and cultural considerations. Lubricants & Maintenance costs refer to the cost of purchasing and replacing lubricants, as well as regular maintenance and timely replacement of parts, which are important for ensuring the longevity and efficiency of the fleet. The monthly docking budget represents the budget for docking and maintaining the fleet on a monthly basis, which includes expenses such as docking fees, port services, and equipment rental fees. Lastly, the value-added tax (VAT) represents an indirect tax on the purchase of goods and services used in the operation of the fleet, and in this case, is 11%. Understanding these cost items is important for analyzing the financial performance of PT. ABC and making informed business decisions.

This section will analyze and discuss the results of cost analysis of comparables companies. The research analyze two companies MBBS.JK and PSS.JK as the research comparables because both of the companies operates in the marine transportation industry. The main reseacon for conducting the analysis from comparables companies is to be use as a benchmark for PT. ABC’s cost structure. Figure IV.3 and IV.4 Illustrates the comparable companies cost structure.

PT ABC has a simplified cost structure compared to PSSI.JK and MMBS.JK. The main cost items for PT ABC include crew wages, estimated document for fleet, meals, lubricants & maintenance, monthly docking budget, and value-added tax (VAT). In contrast, PSSI.JK and MMBS.JK have more diverse and broad cost items that cover a wider range of operational expenses. PSSI.JK focuses on vessel operations, including the cost of charter hire, fuel and diesel oil, spare parts, and insurance, among others. MMBS.JK has a similar focus on vessel operations, including fuel, salaries, spare parts, and repairs and maintenance, but also includes costs for heavy equipment rental, telecommunication, and vessel survey. Overall, the cost structures of these companies reflect their unique business operations and needs. Understanding the cost items is important for analyzing their financial performance and making informed business decisions.



Figure IV. 3. PSSLJK Cost Analysis

PSSLJK Cost Analysis				
Year	2018	2019	2020	2021
Charter hire	9.015.165	7.408.030	9.914.070	20.712.047
Depreciation	12.137.666	14.751.337	15.061.747	13.565.570
Fuel and diesel oil	11.114.929	13.609.354	9.625.227	12.940.738
Vessels operational	-	-	3.670.513	7.021.397
Spare parts and lubricants	2.684.663	4.259.661	2.575.671	4.597.215
Port charges	1.782.082	2.583.209	2.908.293	2.516.048
Depreciation of right-of-use assets	-	-	-	1.952.712
Voyage repairs and maintenance	1.013.677	1.315.565	1.459.091	1.625.015
Insurance	-	-	675.313	1.040.437
Stevedoring	-	-	3.085.877	982.363
Crew wages and allowances	4.446.854	13.609.354	1.169.396	704.945
Victualling crew	734.208	1.498.417	-	-
Others (each below US\$500,000)	(Source: Analysis, 2022) 2.453.368	-	-	-
Total	45.382.612	61.205.222	55.876.843	73.833.411

PSSLJK Cost Analysis - Common Size				
Year	2018	2019	2020	2021
Charter hire	19,86%	12,10%	17,74%	28,05%
Depreciation	26,75%	24,10%	26,96%	18,37%
Fuel and diesel oil	24,49%	22,24%	17,23%	17,53%
Vessels operational	-	-	6,57%	9,51%
Spare parts and lubricants	5,92%	6,96%	4,61%	6,23%
Port charges	3,93%	4,22%	5,20%	3,41%
Depreciation of right-of-use assets	-	-	-	2,64%
Voyage repairs and maintenance	0,00%	0,00%	2,39%	2,21%
Insurance	-	-	1,21%	1,41%
Stevedoring	-	-	5,52%	1,33%
Crew wages and allowances	9,80%	22,24%	2,09%	0,95%
Victualling crew	1,62%	2,45%	-	-
Others (each below US\$500,000)	-	-	-	-
	5,41%	3,55%	7,86%	6,16%



Figure IV. 4. MBSS.JK Cost Analysis

MBSS..JK Cost Analysis - Common Size				
Year	2018	2019	2020	2021
Depreciation (Note 8)	39,91%	33,94%	41,33%	35,94%
Fuel	21,93%	18,64%	13,72%	22,92%
Salaries and allowance	12,06%	13,85%	12,22%	12,66%
Spareparts	7,19%	8,42%	13,29%	8,42%
Port charges and anchorage	5,86%	7,81%	6,30%	6,81%
Vessel charter	0,05%	3,06%	-	4,29%
Vessel and heavy equipment insurances	1,38%	2,09%	2,99%	2,46%
Vessel supplies	1,50%	1,50%	1,68%	1,87%
Food and water provision	1,39%	1,91%	1,83%	1,73%
Repairs and maintenance	1,58%	1,68%	1,25%	1,30%
Handling spareparts	0,67%	0,91%	1,27%	0,97%
Certificate and shipping documents	0,93%	1,57%	1,35%	-
Agency, lumpsum and disburment	1,70%	1,57%	-	-
Heavy equipment rental	1,43%	1,07%	-	-
Telecommunication	0,56%	0,74%	-	-
Transportation	0,59%	0,61%	-	-
Vessel survey	0,54%	0,53%	-	-
Others	0,71%	0,11%	2,77%	0,64%
Total	100,00%	100,00%	100,00%	100,00%

(Source: Analysis, 2022)

MBSS..JK Cost Analysis				
Year	2018	2019	2020	2021
MMBS.JK				
Depreciation (Note 8)	28.147.788	20.156.118	21.068.400	20.400.132
Fuel	15.466.157	11.071.301	6.996.445	13.012.205
Salaries and allowance	8.502.755	8.224.892	6.229.858	7.189.308
Spareparts	5.069.124	4.998.570	6.776.906	4.781.013
Port charges and anchorage	4.132.028	4.639.762	3.210.010	3.863.630
Vessel charter	34.762	1.817.763	-	2.433.167
Vessel and heavy equipment insurances	974.983	1.240.828	1.523.833	1.398.668
Vessel supplies	1.061.115	891.415	854.662	1.061.776
Food and water provision	982.899	1.132.901	930.643	981.252
Repairs and maintenance	1.116.055	996.554	639.647	735.336
Handling spareparts	474.082	540.003	648.206	549.315
Certificate and shipping documents	658.583	930.085	690.503	-
Agency, lumpsum and disburment	1.198.079	931.986	-	-
Heavy equipment rental	1.006.165	637.196	-	-
Telecommunication	393.890	442.135	-	-
Transportation	417.540	360.620	-	-
Vessel survey	384.314	315.196	-	-
Others	503.345	64.237	1.412.327	360.516
Total	70.523.664	59.391.562	50.981.440	56.766.318

Figure IV. 5. Project’s Depreciation Expense Calculation

Depreciation Expense =	Cost value - residual value
	Useful life
	Rp 40.500.000.000- Rp
=	20.250.000.000
	10 years
Annual Depreciation Expenses =	Rp 2.025.000.000



(Source: Analysis, 2022)



Figure IV. 6 Project's Income Statement Projection of the Project for 10 Years

Project's Operating Cashflow	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Revenue		12.517.200.000	13.540.972.507	14.648.478.608	15.846.566.812	17.142.645.762	18.544.730.048	20.061.489.768	21.702.304.142	23.477.319.506	25.397.512.061
OPEX		(3.014.000.000)	(3.128.550.280)	(3.247.730.682)	(3.371.728.356)	(3.500.738.017)	(3.634.962.247)	(3.774.611.821)	(3.919.906.031)	(4.071.073.033)	(4.228.350.205)
EBITDA		9.503.200.000	10.412.422.227	11.400.747.926	12.474.838.456	13.641.907.745	14.909.767.801	16.286.877.947	17.782.398.110	19.406.246.473	21.169.161.856
Depreciation		(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)	(2.025.000.000)
EBIT		7.478.200.000	8.387.422.227	9.375.747.926	10.449.838.456	11.616.907.745	12.884.767.801	14.261.877.947	15.757.398.110	17.381.246.473	19.144.161.856
Tax	25%	(1.869.550.000)	(2.096.855.557)	(2.343.936.981)	(2.612.459.614)	(2.904.226.936)	(3.221.191.950)	(3.565.469.487)	(3.939.349.528)	(4.345.311.618)	(4.786.040.464)
Net Operating Profit After Tax (NOPAT)		5.608.650.000	6.290.566.670	7.031.810.944	7.837.378.842	8.712.680.809	9.663.575.851	10.696.408.460	11.818.048.583	13.035.934.855	14.358.121.392
Add: Depreciation		2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000
Operating Cashflow		7.633.650.000	8.315.566.670	9.056.810.944	9.862.378.842	10.737.680.809	11.688.575.851	12.721.408.460	13.843.048.583	15.060.934.855	16.383.121.392

Figure IV. 7 Project's Cashflow

Years	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Initial Investment	(40.500.000.000)										
Cash Inflow		7.633.650.000	8.315.566.670	9.056.810.944	9.862.378.842	10.737.680.809	11.688.575.851	12.721.408.460	13.843.048.583	15.060.934.855	16.383.121.392
Net Cashflow	(40.500.000.000)	7.633.650.000	8.315.566.670	9.056.810.944	9.862.378.842	10.737.680.809	11.688.575.851	12.721.408.460	13.843.048.583	15.060.934.855	16.383.121.392
Accumulated Cashflow	(40.500.000.000)	(32.866.350.000)	(24.550.783.330)	(15.493.972.386)	(5.631.593.544)	5.106.087.265	16.794.663.116	29.516.071.576	43.359.120.159	58.420.055.014	100.115.676.405
PV Cash Inflow	(40.500.000.000)	6.881.739.707	6.758.088.054	6.635.494.546	6.513.968.790	6.393.526.660	6.274.188.872	6.155.979.771	6.038.926.280	5.923.057.013	14.782.586.593
PV Accumulated Cashflow	(40.500.000.000)	(33.618.260.293)	(26.860.172.239)	(20.224.677.693)	(13.710.708.903)	(7.317.182.243)	(1.042.993.371)	5.112.986.399	11.151.912.679	17.074.969.692	31.857.556.285

IRR	23,49%
NPV	31.857.556.285
Payback Period	5,17 Years
Profitability Indes (PI)	1,79



(Source: Analysis, 2022)

Figure IV. 8 Project's FCFF

Cash Flows (FCFF & FCFE)											
Years	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Free Cashflow to Firm (FCFF)											
NOPAT		5.608.650.000	6.290.566.670	7.031.810.944	7.837.378.842	8.712.680.809	9.663.575.851	10.696.408.460	11.818.048.583	13.035.934.855	14.358.121.392
D&A		2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000
Operating Cashflow		7.633.650.000	8.315.566.670	9.056.810.944	9.862.378.842	10.737.680.809	11.688.575.851	12.721.408.460	13.843.048.583	15.060.934.855	16.383.121.392
Net Fixed Asset Investment	(40.500.000.000)	(2.025.000.000)	4.050.000.000	6.075.000.000	8.100.000.000	10.125.000.000	12.150.000.000	14.175.000.000	16.200.000.000	18.225.000.000	20.250.000.000
Change in working capital		(3.014.000.000)	(114.550.280)	(119.180.402)	(123.997.674)	(129.009.660)	(134.224.231)	(139.649.574)	(145.294.210)	(151.167.002)	(157.277.172)
Free Cashflow to the Firm		2.594.650.000	12.251.016.390	15.012.630.542	17.838.381.167	20.733.671.149	23.704.351.620	26.756.758.886	29.897.754.373	33.134.767.853	36.475.844.220
Terminal Cashflow											25.312.500.000
Total Cashflow		2.594.650.000	12.251.016.390	15.012.630.542	17.838.381.167	20.733.671.149	23.704.351.620	26.756.758.886	29.897.754.373	33.134.767.853	61.788.344.220
PV FCFF		2.339.078.413	9.956.440.830	10.999.040.246	11.782.011.222	12.345.429.297	12.724.011.980	12.947.785.376	13.042.671.454	13.031.005.114	21.906.174.278

(Source: Analysis, 2022)

Figure IV. 9 Project's FCFE

Years	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Free Cashflow for Equity (FCFE)											
NOPAT		5.608.650.000	6.290.566.670	7.031.810.944	7.837.378.842	8.712.680.809	9.663.575.851	10.696.408.460	11.818.048.583	13.035.934.855	14.358.121.392
D&A		2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000	2.025.000.000
Operating Cashflow		7.633.650.000	8.315.566.670	9.056.810.944	9.862.378.842	10.737.680.809	11.688.575.851	12.721.408.460	13.843.048.583	15.060.934.855	16.383.121.392
Change in WC		(3.014.000.000)	(114.550.280)	(119.180.402)	(123.997.674)	(129.009.660)	(134.224.231)	(139.649.574)	(145.294.210)	(151.167.002)	(157.277.172)
Changes in Debt		(4.600.301.192)	(5.082.012.841)	(5.614.165.994)	(6.202.042.537)	(6.851.477.435)					
Free Cashflow to the Equity		19.348.808	3.119.003.549	3.323.464.548	3.536.338.631	3.757.193.713	11.554.351.620	12.581.758.886	13.697.754.373	14.909.767.853	16.225.844.220
Terminal Cashflow											25.312.500.000
Total Cashflow		19.348.808	3.119.003.549	3.323.464.548	3.536.338.631	3.757.193.713	11.554.351.620	12.581.758.886	13.697.754.373	14.909.767.853	41.538.344.220
PV FCFE		17.442.961	2.534.824.319	2.434.944.377	2.335.704.179	2.237.142.135	6.202.140.045	6.088.402.351	5.975.542.769	5.863.607.133	14.726.826.219

(Source: Analysis, 2022)



Figure IV.3 and Figure IV.4 displays the projected cashflow for the next 10 years. Figure IV.3 illustrates the project operating cashflow calculation which will be used for the annual cash inflow or outflow in the capital budgeting analysis. Figure IV.4 is the projections for the expansion project that is used to determine the projects, NPV, PBP, IRR, and PI. Figure IV.4 also shows the projects PV inflows throughout the project’s lifetime.

Table IV.5 Project’s Feasibility Indication

Indication	Results	Criteria	Decision
IRR	23,49%	>10,93%	Accept
NPV	31.857.556.285	>0	Accept
Payback Period	5,17 Years	Within time frame	Accept
Profitability Index (PI)	1,79	>1	Accpet

(Source: Analysis, 2022)

Referring to Table IV.5, the shown in the inside the table is the summary of the feasibility result of the expansion project. It illustrates a positive IRR of 23,49% which is higher than the discount rate or the cost of capital of 10,93%. Also, the project produced a positive NPV of Rp 31.857.556.285. The profitability index or PI for the investment project is 1,79 which is greater than 1. Lastly, the project has a payback period of 5,13 years. To conclude, by examining the project’s indications suggested that the project is feasible to pursue for PT. ABC.

IV.3.2 Sensitivity Analysis & Scenario Analysis

Figure IV. 10 Sensitivity Analysis

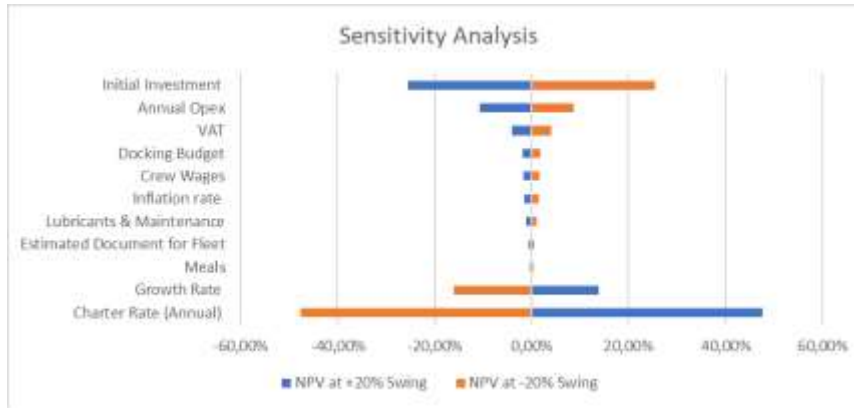
	Current Assumption	+.20% Swing	-.20%(Swing	Current NPV	NPV at +20% Swing	NPV at -20% Swing
Charter Rate (Annual)	12.517.200.000	15.020.640.000	10.013.760.000	31.857.556.285	47.016.869.281	16.698.243.288
Growth Rate	8,18%	9,60%	6,40%	31.857.556.285	36.281.988.890	26.729.074.738
Meals	120.000.000	144.000.000	96.000.000	31.857.556.285	31.733.860.956	31.981.251.613
Estimated Document for Fleet	180.000.000	216.000.000	144.000.000	31.857.556.285	31.698.053.526	32.017.059.043
Lubricants & Maintenance	360.000.000	432.000.000	288.000.000	31.857.556.285	31.486.470.299	32.228.642.270
Inflation rate	4,04%	4,85%	3,23%	31.857.556.285	31.397.765.847	32.301.954.050
Crew Wages	530.000.000	636.000.000	424.000.000	31.857.556.285	31.311.235.251	32.403.877.318
Docking Budget	570.000.000	684.000.000	456.000.000	31.857.556.285	31.270.003.474	32.445.109.095
VAT	1.254.000.000	1.504.800.000	1.003.200.000	31.857.556.285	30.564.940.102	33.150.172.467
Annual Opex	(3.014.000.000)	(3.616.800.000)	(2.411.200.000)	31.857.556.285	28.439.811.414	34.616.204.952
Initial Investment	40.500.000.000	48.600.000.000	32.400.000.000	31.857.556.285	23.757.556.285	39.957.556.285

(Source: Analysis, 2022)

In relation to the feasibility indicators presented in Table IV.5, this research also conducted a sensitivity analysis towards which is represented by Figure IV.5. The sensitivity analysis framework is useful to examine the changes in input variables towards the target variable. In this case, the target variable is the projects NPV. The base assumption is that how the input variables influence the change on the NPV if there is a positive 20% swing and minus 20% swing for the input variables. The input variables are represented by the column on the far left of the table. The input variables can be identified as the charter rate, growth rate, operational expenses items, inflation rate, and lastly the cost of the asset itself which is represented by the initial investment. Figure IV.6 can be identified as the sensitivity analysis’ tornado diagram. This diagram illustrates input variables that has the highest impact towards the projects’ NPV. From the diagram it is visible that the variable that has the highest impact towards the projects’ NPV. By examining the diagram, the input variable that has the biggest influence on the project’s NPV is the charter rate, followed by the initial investment and growth rate of the charter rate.



Figure IV. 11 Sensitivity Analysis' Tornado Diagram



Lastly, Figure IV.7 illustrates the scenario analysis of the project. The scenario analysis allows the company to assess the most possible events or scenarios that could occurs in the future. The analysis also allows the management to predict feasible result or possible outcomes of a scenario. Similar to the sensitivity analysis, the target that being analyze it the project NPV. The input variables for the analysis are also following the input variables form the sensitivity analysis. Due to limited access to the historical data, the scenario analysis will employ the same assumptions with the sensitivity analysis by examining the 20% swing for each input variables.

Table IV. 5 Charter Rate Scenario Analysis

NPV	Sensitivity	Charter Rate
31.857.556.285	100%	12.517.200.000
24.467.391.199	95%	11.891.340.000
17.456.208.938	90%	11.265.480.000
10.824.009.502	85%	10.639.620.000
4.570.792.892	80%	10.013.760.000
(1.303.440.894)	75%	9.387.900.000
(6.798.691.856)	70%	8.762.040.000
(11.914.959.992)	65%	8.136.180.000

(Source: Analysis, 2022)

Due to significant impact the charter rate has on the project feasibility, the research also included a separate sensitivity analysis on the target annual charter rate. Figure IV.7 illustrates the effect of the rate towards the project's NPV. Based on the calculation, the management can maintain a NPV greater 0 if the charter rate is not below 80% (Rp 10.013.760.000) of the base charter rate of Rp. 12.517.200.000. To simplify, the company must charge a minimum of Rp 834.480.000 per month (Rp 10.013.760.000/12 months). The first scenario is the base scenario which used all of the current assumption for the project. The next scenario examines the worst-case scenario that could happened to the project if there is a -20% swing to the input variables. However, considering -20% swing for the expense variables is an increase in the expenses for 20% because it indicates the increasing expenses which lowers the overall cashflow. With that consideration, worst case scenario NPV is Rp 17.610.636.168 which still indicates a positive NPV. On the other hand, the best-case scenario examines the best possible outcome from the change in the input variables. Following the same assumptions for the expenses, a positive 20% swing means a decrease in expenses by 20%. Therefore, the NPV for the best-case scenario is Rp. 48.533.892.866.



Figure IV. 12 Scenario Analysis

	Worst Case 1	Base Case 2	Best Case 3
Growth Rate	4,09%	8%	12,27%
Inflation rate	8,38%	4,04%	1,68%
Initial Investment	48.600.000.000	40.500.000.000	32.400.000.000
Charter Rate (Annual)	10.013.760.000	12.517.200.000	15.020.640.000
Annual Opex	(3.616.800.000)	(3.014.000.000)	(2.411.200.000)
Crew Wages	(636.000.000)	(530.000.000)	(424.000.000)
Estimated Document for FI	(216.000.000)	(180.000.000)	(144.000.000)
Meals	(144.000.000)	(120.000.000)	(96.000.000)
Lubricants & Maintenance	(432.000.000)	(360.000.000)	(288.000.000)
Monthly Docking Budget	(684.000.000)	(570.000.000)	(456.000.000)
VAT	(1.504.800.000)	(1.254.000.000)	(1.003.200.000)
NPV	17.610.636.168	31.857.556.285	48.533.892.866

(Source: Analysis, 2022)

CHAPTER V CONCLUSION AND RECOMMENDATION

V.1 Conclusion

By analyzing the test result, it evident that the investment project of acquiring 1 set of tugboat and barge by referring to the base scenario is feasible. The data that indicates the feasibility of the project is reflected by the positive NPV of Rp 31.857.556.285 which is grater than 0. Furthermore, the internal rate of return of the investment project is 23,49%. The minimum requirement to accept an investment project is when the IRR > Cost of Capital, in this case the 23,49% > 10,39%. The project yielded a 1,79 PI ratio which is higher than 1, this indicates the higher profitability for the project. Lastly, the PBP period is 5,17 years.

Furthermore, by examining the sensitivity analysis the company could now which variable that influence the NPV the most. In this case, the most influential is the charter rate. A 20% increase in charter rate would increase the projects' NPV up to Rp. 47.016.869.28., and if the market condition uncertain a 20% decrease of the charter rate the project would remain feasible. Also, referring to the charter rate sensitivity analysis, the company should charge a minimum charter rate of Rp 834.480.000 per month. The reason for the minimum rate is because if the company charge lower than the minimum charter rate, the project will project a negative NPV which means the project would not be feasible to pursuit.

V.2 Recommendation

Based on the analysis results stated above, PT. ABC should proceed to accept the investment project under the base scenario assumptions. Also, if there is change in the market condition, PT. ABC should consider monitoring their freight rate so the project could remain feasible. Based on the calculation the minimum charter rate charge to the customer is Rp 834.480.000 per month in order to maintain project feasibility.

There are a few risk management the PT. ABC could consider in regards to the price/tarrif sensitivity analysis. To address the risks arising from tugboat tariffs, there are several risk management techniques that can be employed. One such technique is diversification, which involves using multiple tugboat service providers to reduce dependence on any single provider, thus lessening the risk of tariffs imposed by that provider. Another technique is negotiation, which entails discussing the sharing of tariff costs with the tugboat service providers. Tariff engineering is another approach that involves altering the tugboat services or production process to minimize the effect of tariffs. Monitoring and scenario planning is another technique that involves keeping a watchful eye on changes in tugboat tariffs and devising contingency plans to address any potential impacts. Finally, hedging can be employed by using financial tools such as futures contracts, options, and swaps to protect against changes in tugboat tariffs.

V.3 Implementation Plan

This section discusses the plan and steps in implementing the expansion project. The plan will follow a series of process leading up to the acquisition of the asset.



Step 1 – Project Planning

The first step of the process is project planning, it involves multiple function for the decision in acquiring the new asset. Based on the discussion with PT. ABC management, the decision to purchase a new asset derived from the request of the marketing team. Due to the current market conditions, the sales and marketing is overflowing with request from potential customers. This leads to the management decision to add an additional set of tugboat and barges to the fleet. Afterwards, the management conduct a feasibility study on the as well as constructing a term of reference (TOR). As a result, the management need to construct a proposal that will be presented to the board of director (BOD).

Step 2 – Procurement

In this stage, the management will initiate the procurement process. The division that are involved in this process is the supporting division. The procurement division will search and evaluate the most credible vendors to purchase the asset. In parallel to procurement division, the finance division have the responsibility to source the funding for the project.

Step 3 – Project Initiation

After selecting the best vendors to the deliver the asset and securing the funding for the project. The project will commence in the beginning of Q3 of 2023, and the construction project is estimated to be completed in November 2023. Afterwards, the acquired asset could start operating in the following month.

Table V. 1 Project Timeline

PHASE	DETAILS	Q3 2021			Q4 2021			Q1 2022			Q4 2022	Q1 2023		Q4 2023
		JUL	AUG	SEPT	OCT	NOV	DEC	JAN	FEB	MAR	DEC	JAN	FEB	NOV
PROJECT WEEK:					18									
1	Request from marketing team	Request from marketing team												
	Feasibility study		Feasibility Study											
	Term of reference			Term of Reference										
	Proposal Generation				Proposal Generation									
2	Vendor Selection						Procurement							
	Fund Raising						Fund Raising							
3	Tugboat and Barge Construction													
	Tugboat and Barge put into service											Project Initiation	Tugboat & Barge Put into Service	

Appendix

1.1. Interview Transcript

Interview with PT. ABC Finance Manager: Trika Gunawan

The Transcript shows the writer’s interview with PT. ABC’s financial manager. The interview took place at PT. ABC main office at North Jakarta. In the transcript the writer will be labelled “W” and as the respondent, Mr. Trika Gunawan will be labelled “T”. In the transcript the respondent (Mr. Trika Gunawan) will occasionally mention “Bisma” or “Bis” which is the writer’s name. The interview transcript took place on the 10th of October 2022.

First interview session (10th October 2022) transcript:

W: Good afternoon, Pak Trika how are you?

T: Afternoon Bisma, I’m great how are you?



W: Alhamdulillah I am good pak. I would like to thank you for your time to allow me to interview you for my thesis final project. So, I have heard that PT. ABC is planning to expand their fleet of tugboat and barge. I would like to do a feasibility study for that project. There are a few questions that I would like to ask you pak in regard to the project.

T: No worries, so what do you like to know first?

W: Firstly, I would like to know the a about the background of the project. What is the reason PT. ABC decided to expand their number of tug boat and barge.

T: Actually, there are a couple of reasons and all of it corelates with each other. As you know it the global demand for coal and nickel is quite high these days. Being a part of the mining supply chain, our type of service is the most cost-efficient and effective way to transport these mining products. Therefore, the demand for tugboats and barges has been quite high lately.

W: I see pak

T: And our company is also affected by the change in the demand from the market. Our marketing team reported that there is a que for the customer, because we are unable to fulfil the demand. With that basis we (the management) has decided to increase the number of tugboat and barge to our existing fleet.

W: Oh I see pak, so because of the surge in demand the management wants to increase its operational capabilities by adding 1 set of tugboat and barges to PT.ABC's existing fleet.

T: That's correct

W: If I may ask, what is the current state of the expansion project? And can you please share with me the timeline from the beginning until the end of the acquisition process? What steps that has to be taken by the management?

T: Sure, currently we are on the process of fund raising, I am currently on the process of applying a loan to bank(s). There are a few banks that we approached and are in the process of negotiation.

The procurement process is divided into three phases.

So, the timeline for this project begins in July 2021. The management received a report from the marketing team that we (PT. ABC') is unable to fill the customer order anymore. And because of the market condition they can't find any similar service provider as well. Therefore, looking at the market condition the management especially the board of directors (BOD) decided to add an additional set of boat to our fleet. Afterwards, a few of the company's function mainly the finance and operational/technical division sat down for a meeting to discuss the plans for acquiring the asset. The first step in acquiring the asset is to do a feasibility study in terms of technical and operational aspect of the project. Also, the team created a term of reference for the project. Afterwards, we created the proposal that will be presented and approved by the BOD. This is the first phase of the project procurement.

The second phase is the procurement process itself. After being approved by the BOD, the management can start the procurement process. There are two main objective in this process, the procurement is responsible for selecting the best vendors to do the project. And there is fund rising which is my (Mr. Trika) responsibility. I am responsible for find funding for this project. The deadline for both of the objectives is on the February 2023. Obviously, the procurement division must have the list of vendors first so we (the finance team) can determine the cost and funds needed to run the project.

And the las phase, which is the project launch and execution. The last phase is the construction of the new boat and barge. Ideally, if the project begins in February 2023, the boat can be operational by November 2023.

W: Wow ok pak, thank you for the explanation. I have a few more questions in regard to the project. Can you please give me the detail of the type of boat and barge that is going to be purchased in this project.

T: We have decided to purchase the 300ft barge with a capacity of 8.000mt, and for the tugboat itself is similar to other boats owned by PT. ABC with a main engine of caterpillar and perkins secondary engine.

W: Ok understood pak, and how long is the useful life of the tugboat and barge. Also, what is the selvage value of each set?

T: Commonly, the boat and barge can last up to 10 years. We have boats and barges that last more than 10 years. Also, because we really pay close attention to the ship and barge maintenance and we can have 50% of the acquisition price for the selvage value.

W: I see pak. May I see the cash projection for the investment project.

T: Sure bis ill just copy it to your hard drive (procced to copy the file).

W: *Examine the file* so these are the projection for the project?



T: Yes, as you can see these are the financial projection. It's a very simple projection which includes the revenue and expenses for the project.

W: So, what is your revenue and expenses growth rate?

T: For the revenue growth rate it could be 50% and the expenses are following the inflation rate.

W: Really? 50%? It's quite huge pak.

T: Yes I know, because looking at the demand right now it is very possible.

W: Understood pak. For the funding what is the composition and what is the interest rates for the loan.

T: So the funding structure will be 70% loan and 30% equity, and we are applying for a 5 years loan with an 11% interest per anum.

W: Alright pak noted. Well I think that's all the questions that I would like to ask in regards to the project. Thank you very much Pak Trika for your time. I wish you luck for the project. I hope you don't mind if I have any further questions in the future about this project. If I may, can I have access to the necessary documents such as the company's financial reports, sales data, as well as expenses associated to the project.

T: No worries bis, I'll have someone send you the data just give me your email or USB. Thank you and goodluck for your as well. End of transcript.

ACKNOWLEDGEMENTS

Praise the mighty and the most merciful Allah SWT for His blessings and love. Without His presence and His grace, the completion of this final project would not have been possible. This final project is a part of the curriculum to complete the study in Master of Business Administration Program at Institute Technology Bandung in Jakarta Campus.

In this opportunity, the author would like to express his gratitude to:

1. My beloved family for the endless support, and especially my father who provided me with his wisdom, prayers, and unconditional love.
2. My respected advisor Mr. Oktofa Yudha Sudrajad, S.T., M.S.M., Ph.D., for his patience and insights in guiding the author on his journey to complete this research paper.
3. My beloved friends Rangga Dwiandra, Prima Lutfhinanda, Lucia Abigail, Amanda Alda, Iqbal Karim, Nadya Adira, Farah El Qadriani, Syahrul Fahreza, Bella Elga, Irnindito Putra, Norman Seno, Amalia Rayhana, Ilham Sapta Aji, Yudha Lampe, Reza Rhamadani, and Agung Wirayogi for supporting me on my post graduate journey and the completion of this research.
4. Mr. Trika G. Adiwibowo for his insight about the project.

The author fully acknowledges that research is far from perfect, but the author hopes that this final paper could provide valuable and useful insight for the readers who have an interest or who is in the industry and have been equipped with the relevant theoretical knowledge.

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