



Capital Budgeting Analysis of Broiler Farm Construction in Central Java

Guritno Suro Amijoyo

School of Business and Management, Institut Teknologi Bandung, Indonesia

ABSTRACT: Indonesia, positioned as a prominent emerging market, draws its economic strength from a diverse mix of agriculture, manufacturing, and a thriving services sector. The nation's strategic location, coupled with abundant resources and a youthful population, forms a resilient economic foundation that has contributed to its sustained growth. One notable sector that plays a pivotal role in meeting the country's protein needs is the poultry industry. Chicken consumption has risen to 7.41 kilograms per capita yearly, indicating a substantial 9.23% increase from 2020. Against this backdrop of economic vibrancy and shifting consumption patterns, PT.XYZ, a key player in the poultry industry, is strategically positioning itself for expansion. Recognizing the immense potential within Indonesia's dynamic poultry sector, PT.XYZ is planning to enhance its broiler meat production capabilities through the construction of new broiler chicken farm facilities. This research endeavours to provide PT.XYZ with a comprehensive feasibility analysis for the envisioned broiler chicken farm facilities. The proposed facilities are designed to produce a significant volume, with a capacity of up to 16.8 million chickens annually, equivalent to approximately 29,3 million kilograms of chicken meat per year. The construction timeline is strategically set for two years, spanning from September 2024 to October 2026. The research findings present a compelling case for the feasibility of PT.XYZ's ambitious broiler farm construction project. Financial indicators reveal a positive Net Present Value, an Internal Rate of Return that exceeds the Weighted Average Cost of Capital (WACC), and a Payback Period of five years, aligning with the company's strategic plans. These results underscore the financial viability and attractiveness of the proposed expansion.

KEYWORDS: Agricultural Infrastructure, Broiler Farm Construction, Capital Budgeting, Poultry Industry.

INTRODUCTION

Broiler chicken meat serves as a readily available and relatively affordable source of animal protein for many Indonesians. The past five years witnessed significant developments in the industry, including growth in population, production, and consumption. Analyzing these trends provides valuable insights into the future of the sector. To predict future trends, researchers employed trend analysis modelling to estimate population, production, consumption, and balance of broiler meat over the next five years (2022-2026). This modelling approach proved effective, yielding accurate results with a low MAPE value. Additionally, rigorous feasibility tests ensured the reliability of the models. The broiler chicken population is expected to experience steady growth, increasing by approximately 1.45% annually until 2026. This translates to an estimated population of 3.17 billion in 2022 and 3.35 billion in 2026. Consequently, broiler chicken meat production is projected to reach 3.65 million tons by 2026, reflecting a positive trajectory for the industry. Excitingly, the models predict that production will outpace consumption, resulting in a projected surplus for the next five years. The estimated surplus in 2022 is 764.65 thousand tons, and it remains substantial throughout the period, reaching 203.49 thousand tons in 2026. This surplus indicates a positive outlook for the Indonesian broiler chicken industry, suggesting its potential to meet the growing demand for this vital protein source. The analysis of historical trends and projections for the future indicate a promising outlook for the Indonesian broiler chicken industry. With steady population growth, anticipated increases in production, and a projected surplus of meat, the industry appears poised for continued success, contributing significantly to food security and economic development in Indonesia. (Centre for Agricultural Data and Information Systems of Indonesia, 2022).

The surging demand for chicken meat in Indonesia has prompted a strategic and forward-looking response from the poultry industry. To address the ever-growing consumption, a significant emphasis is being placed on expanding production capacity through targeted investments in new broiler farm facilities. This approach reflects the industry's commitment to ensuring a consistent and ample supply of this dietary staple. These modern broiler farms are envisioned as centres of innovation, equipped with cutting-edge technologies and meticulously designed to optimize every aspect of chicken rearing. From climate-controlled environments that enhance growth rates to advanced feeding systems that promote efficient resource utilization, these facilities embody a holistic approach to meeting the increased demand while adhering to sustainable and environmentally conscious practices.



As these new broiler farm facilities come to fruition, their impact extends beyond meeting the immediate consumer needs. They represent a tangible step toward bolstering the nation's food security and supporting local economies through job creation and agricultural development. Moreover, these investments underline the industry's commitment to continuous improvement, aligning production practices with evolving consumer preferences and international standards. By embracing innovation and scaling up production capacity, the Indonesian poultry sector is poised to not only satisfy the current surge in chicken meat consumption but also lay the foundation for a resilient and dynamic agricultural future.

Therefore, in order to gain the opportunity in the ever growing chicken meat consumption, PT.XYZ is planning to construct a new broiler farm facility which consisted of 6 flocks with estimated productivity of 16.800.000 chicken per year. With the construction of the new broiler farm facility, PT.XYZ hoped that it can further gain more market share in the broiler chicken meat industry in Indonesia.

The primary objective of this research is to conduct a comprehensive analysis of the feasibility of the Broiler Farm project. The first aim is to delve into the intricacies of the project, evaluating its viability from financial perspectives. This involves a thorough examination of Net Present Value, Internal Rate of Return, Payback Period, and Profitability Index. By scrutinizing these elements, author aim to provide an understanding of the project's feasibility from financial perspectives, enabling stakeholders to make informed decisions.

Furthermore, the research seeks to identify and prioritize variables that significantly influence the overall feasibility of the Broiler Farm project. In doing so, we aim to pinpoint the key factors that have a substantial impact on the success or challenges faced by the project. The identification of these critical variables is crucial for stakeholders as it allows for a targeted approach in addressing potential obstacles and optimizing the project's chances of success.

THEORETICAL FOUNDATION

Capital Budgeting Analysis

Capital budgeting is the process of identifying, evaluating, and selecting investments in long-term assets (Shapiro, 2019). The process of project valuation analysis using capital budgeting methods is essential for selecting financially viable projects that enhance a company's value. It serves as a means for investors to determine the worth of a potential investment project. Within the capital budgeting process, management faces the task of deciding which long-term assets, often involving substantial financial resources, the company will acquire. The Discounted Cash Flow (DCF) approach is employed to make informed decisions regarding capital budgeting. This established valuation framework is directly tied to finance theory, aligning with the objective of maximizing the company's value through corporate management decision-making. It focuses on what finance deems the most significant, and in some cases, the sole valuation factor—the present value of anticipated cash flows.

Financial Projection

Financial projection is the process of estimating future financial performance of an organization based on assumptions about future events (Rahim & Malik, 2003). This forward-looking analysis typically involves predicting key financial metrics such as revenue, expenses, profits, and cash flows over a specific period, often one to five years. Financial projections are an integral part of strategic planning and decision-making, providing insights into the potential outcomes of various business strategies and helping management allocate resources effectively. These projections are essential for communicating the company's expected financial performance to stakeholders, including investors, lenders, and internal decision-makers. They serve as a roadmap for the organization, guiding budgeting, investment decisions, and overall financial management.

Creating accurate financial projections requires a thorough understanding of the business environment, industry dynamics, and the company's internal operations. Assumptions about factors like market demand, pricing, and operating costs play a crucial role in shaping these projections. Regular monitoring and updating of projections are essential as conditions change, allowing businesses to adapt their strategies in response to evolving circumstances. While financial projections involve a level of uncertainty, they are valuable tools for strategic planning, risk management, and assessing the financial health of a business in the foreseeable future.

Financial projection lengths often follow the lifespan of a business's longest-lived asset for several reasons. Matching projections with depreciation schedules ensures accurate cost reflection and informs replacement needs. Aligning projections with loan terms and bond maturities minimizes financial risk and strengthens lender confidence. This timeframe also fosters strategic



planning for growth, risk mitigation, and aligning investments with asset lifecycles. While not a rigid rule, this approach provides a solid foundation for informed financial decisions, risk management, and long-term success.

Risk Analysis

Risk analysis is a systematic process of identifying potential risks, assessing their likelihood and impact, and developing responses to them (Rocha, Oliveira, & Capinha, 2020). Risk analysis is a crucial component of decision-making processes, particularly in complex projects where uncertainties can significantly impact outcomes. Sensitivity analysis and Monte Carlo simulation are two powerful techniques employed in risk analysis to quantify and manage uncertainties.

RESEARCH METHODOLOGY

Weighted Average Cost of Capital Calculation

The weighted average cost of capital (WACC) is the average rate of return a company must earn on its existing capital to satisfy its investors and creditors (Gitman, 2014). It represents the average rate of return that a company needs to generate in order to satisfy its capital providers, such as equity shareholders and debt holders. WACC takes into account the proportion of different sources of capital, namely debt and equity, and the respective costs associated with each.

$$r_a = (w_i \times r_i) + (w_p \times r_p) + (w_s \times r_s)$$

Equation 1. WACC Formula

Where :

ra = Weighted average cost of capital

ri = Cost of debt

rp = Cost of preferred stock

rs = Cost of retained earning

rn = Cost of new common stock

wi = Proportion of long-term debt in capital structure

wp = Proportion of preferred stock in capital structure

ws = Proportion of common stock equity in capital structure

Net Present Value Calculation

Net Present Value (NPV) is a fundamental concept in capital budgeting, representing the present value of all expected cash inflows minus the present value of all expected cash outflows over the life of an investment. It helps determine whether an investment is financially viable and creates value for the company (Gitman, 2014).

The concept behind NPV is based on the time value of money, which states that the value of money today is worth more than the same amount of money in the future due to factors like inflation and the opportunity cost of capital. By discounting future cash flows to their present value, NPV takes into account the timing and risk associated with receiving or paying those cash flows.

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

Equation 2. NPV Formula

Where :

CF_t = Cashflow during a single period of t

CF₀ = Cashflow during initial period of project

t = Number of timer periods

r = Discount rate of return that could be earned in alternative investments



The decision criteria if NPV is used as a parameter of accept-reject decision are :

- If the NPV is greater than 0, then accept the project.
- If the NPV is less than 0, then reject the project.

Internal Rate of Return Calculation

The internal rate of return (IRR) is the discount rate that makes the net present value of an investment equal to zero (Gitman, 2014). In other words, it is the rate of return that would make the present value of cash inflows equal to the initial investment. The IRR represents the potential rate of return that the company would achieve by investing in the project and receiving the specified cash inflows.

$$\begin{aligned} \$0 &= \sum_{t=1}^n \frac{CF_t}{(1 + IRR)^t} - CF_0 \\ \sum_{t=1}^n \frac{CF_t}{(1 + IRR)^t} &= CF_0 \end{aligned}$$

Equation 3. Internal Rate of Return Formula

Where :

CF_t = Cashflow during a single period of t

CF₀ = Cashflow during initial period of project

t = Number of timer periods

IRR = Internal rate of return of the project

The decision criteria if IRR is used as a parameter of accept-reject decision are :

- If the IRR is greater than the cost of capital, then accept the project.
- If the IRR is less than the cost of capital, then reject the project.

Payback Period Calculation

The payback period is a simple and widely used capital budgeting technique for evaluating the time it takes for an investment to recover its initial cost. While not as comprehensive as other methods like NPV and IRR, it offers a quick and easy way to assess project liquidity and risk (Gitman, 2014). In the instance of an annuity, the payback period is determined by dividing the initial investment by the annual cash inflow. However, for a mixed stream of cash inflows, the yearly cash inflows need to be accumulated until the initial investment is fully recovered. Despite its popularity, the payback period is generally considered a less sophisticated capital budgeting technique since it does not explicitly account for the time value of money.

When the payback period is used to make accept–reject decisions, the following decision criteria apply:

- If the payback period is less than the maximum acceptable payback period, accept the project.
- If the payback period is greater than the maximum acceptable payback period, reject the project.

Profitability Index Calculation

The profitability index (PI) is the ratio of the present value of all expected cash inflows to the initial investment of an investment (Gitman, 2014). This variation of the Net Present Value (NPV) rule provides a ratio that helps companies make decisions about the viability of potential projects. In a scenario where a project involves an initial cash outflow followed by subsequent cash inflows, the PI is calculated by dividing the present value of the cash inflows by the initial cash outflow.

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

Equation 4. Profitability Index Formula



Where :

CF_t = Cashflow during a single period of t

CF₋ = Cashflow during initial period of project

t = number of timer period

r = Discount rate of return

The decision criterion associated with the profitability index is straightforward: if the index is greater than 1.0, it suggests that the present value of the expected cash inflows exceeds the initial cash outflow. Consequently, a PI greater than 1.0 implies a positive net present value, indicating that the project is likely to generate more cash than it consumes. Companies typically use a PI threshold of 1.0 as a decision rule, choosing to invest in projects only when the index exceeds this value.

Essentially, a profitability index greater than 1.0 aligns with a positive NPV, signifying that the project is expected to create value and contribute positively to the company's financial position. Importantly, the relationship between NPV and PI ensures consistency in decision-making. Both methods, whether based on NPV or PI, will lead to the same conclusion regarding the attractiveness of a particular investment opportunity. Therefore, the profitability index serves as a practical tool for companies to evaluate and prioritize potential projects in their capital budgeting processes.

Sensitivity Analysis

Sensitivity analysis is a technique used in financial modelling and decision-making to assess how changes in key variables or assumptions impact the outcomes of a model or project. It helps to gauge the sensitivity or responsiveness of the results to different input parameters, providing insights into the potential risks and uncertainties associated with a particular decision or forecast.

In sensitivity analysis, various scenarios are created by adjusting one or more variables within a predefined range, while keeping other variables constant. By examining the resulting changes in the model's output or financial metrics, decision-makers can assess the robustness of their decisions and identify critical factors that have a significant impact on the outcomes.

Sensitivity analysis helps decision-makers gain a deeper understanding of the potential risks and uncertainties surrounding their decisions. It provides valuable insights for risk management, strategic planning, and project evaluation, enabling more informed and robust decision-making.

ASSUMPTIONS

General Assumptions

The general assumptions in financial projections serve several important functions in the planning and forecasting process. These assumptions provide a framework for estimating future financial performance and guide decision-making within a company. The general assumptions used in this financial projection will be shown in the table below.

Table I. General Assumptions

Description	Value	Source
Number of Days	365	
Number of Month	30	
Inflation Rate	4,11%	Calculated
Fixed Asset Investment	Rp. 383.545.030.429	Strategic Plan
Working Capital Investment	Rp43.760.276.197	Calculated
Loan Tenor	5 year with 1 year grace period	Strategic Plan
Price Increase	Following Inflation Rate	Strategic Plan
Equity Financing	30%	Strategic Plan
Debt Financing	70%	Strategic Plan

Source: Processed Data and Author's Analysis



Production Plan

The first data that author need in order to calculate the financial feasibility of the project is company’s production plan. In this case, the company had already planned its production plan for the next 10 year and in this case, the production will start after each flock construction finished, so it doesn’t need to wait all flock to be constructed. Selling price of the meat that is used by author is according to Regulations of The National Food Agency of The Republic of Indonesia Number 5 Year 2022 and author took the middle price of the regulation and will increase each year following the inflation rate. The production plan of the company will be shown in the table below.

Table II. Production Plan

Description	Units	2024	2025	2026	2027	2028 Onwards
Flock Capacity	Pcs	0	2.400.000	2.400.000	2.400.000	2.400.000
Flock 1	Pcs	0	400.000	400.000	400.000	400.000
Flock 2	Pcs	0	400.000	400.000	400.000	400.000
Flock 3	Pcs	0	400.000	400.000	400.000	400.000
Flock 4	Pcs	0	400.000	400.000	400.000	400.000
Flock 5	Pcs	0	400.000	400.000	400.000	400.000
Flock 6	Pcs	0	400.000	400.000	400.000	400.000
Cycle						
Flock 1	No of Cycle	0	7	7	7	7
Flock 2	No of Cycle	0	7	7	7	7
Flock 3	No of Cycle	0	7	7	7	7
Flock 4	No of Cycle	0	7	7	7	7
Flock 5	No of Cycle	0	7	7	7	7
Flock 6	No of Cycle	0	7	7	7	7
DOC Buyout	Pcs	0	16.800.000	16.800.000	16.800.000	16.800.000
Flock 1	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Flock 2	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Flock 3	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Flock 4	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Flock 5	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Flock 6	Pcs	0	2.800.000	2.800.000	2.800.000	2.800.000
Mortality Rate		3,00%	3,00%	3,00%	3,00%	3,00%
Harvest	Pcs/year	0	16.296.000	16.296.000	16.296.000	16.296.000
Body Weight	kg/pcs	1,8	1,8	1,8	1,8	1,8
Meat Produced	kg/year	0	29.332.800	29.332.800	29.332.800	29.332.800
Selling Price	Rp/kg	Rp20.364	Rp21.201	Rp22.072	Rp22.980	Rp23.924

Source: Processed Data and Author’s Analysis

Cost of Goods Sold Assumption

Second data that author need is company’s product cost of goods sold. The data that is collected are mostly company’s strategic plan which comes from their experience and historical data of running the business. For day old chick (DOC) price, author used Government Price Regulation which named PPBN No 5 2022 which regulates the price of day old chick (DOC) and author will use its highest price. All of the price will increase each year following the inflation rate. Data that has been collected by author will be shown in the table below.



Table III. Cost of Goods Sold Assumptions

Description	Price	Unit	Source
DOC	6.000	Rp / pcs of DOC Buyout	Regulation
Feed			
Feed Index	2,34	Rp / pcs of DOC Buyout	Strategic Plan
Cost	7100	Rp / Kg	Strategic Plan
Medicine & Vaccine	500	Rp / pcs of DOC Buyout	Strategic Plan
Chaff	200	Rp / pcs of DOC Buyout	Strategic Plan
Heater	300	Rp / pcs of DOC Buyout	Strategic Plan
Direct Labor	280	Workforce (sequential)	Strategic Plan
Manager	Rp10.000.000	/month for 1 people	Strategic Plan
SPV	Rp6.000.000	/month for 16 people	Strategic Plan
Staff	Rp3.000.000	/month for 13 people	Strategic Plan
Head	Rp4.000.000	/month for 31 people	Strategic Plan
Operator	Rp2.000.000	/month for 219 people	Strategic Plan
Overhead	100	Rp / pcs from DOC Buyout	Strategic Plan
Maintenance	3%	of Machinery Cost	Strategic Plan

Source: Processed Data and Author’s Analysis

Capital Expenditure Plan

Capital expenditure in this project will be divided into two, fixed asset capital expenditure and net working capital expenditure. For fixed asset capital expenditure, data that author collected are mostly company’s strategic plan including schedule of the project. For working capital expenditure, author calculated it by subtracting current asset with current liabilities in the following year. Data that has been collected and calculated by author will be shown in the table below.

Table IV. Fixed Asset Capital Expenditure Plan

Year	Land	Infrastructure	Utility	Flock Building	Equipment
2024	Rp6.000.000.000	Rp19.466.316.922	Rp53.777.000.674	Rp166.587.618.426	Rp137.714.094.407
2034	Rp0	Rp0	Rp0	Rp0	Rp137.714.094.407
2041	Rp0	Rp0	Rp0	Rp0	Rp137.714.094.407

Source: Processed Data

Table V. Working Capital Expenditure Plan

DESCRIPTION	2025
Working Capital	
Account Receivables	Rp32.644.715.594
Inventories	Rp32.768.184.632
Total Working Capital	Rp65.412.900.226
Account Payables and Accruals	
Account Payables	Rp21.332.353.131
Accruals	Rp320.270.898
Total Account Payables and Accruals	Rp21.652.624.029
Net Working Capital	Rp43.760.276.197

Source: Processed Data



Operational Expenditure Assumption

Fourth data that author need is company’s operational expenditure. The data that is collected are mostly company’s strategic plan which comes from their experience and historical data of running the business. Data that has been collected by author will be shown in the table below.

Table VI. Operational Expenditure Plan

Description	Price	Unit	Source
Marketing Cost	1%	of revenue	Strategic Plan
SG&A	0,50%	of revenue	Strategic Plan
Provisioning Cost	0,50%	/year of total debt	Strategic Plan
Indirect Labor	24	people (sequential)	
Director	Rp20.000.000	/month for 3 people	Strategic Plan
Manager	Rp10.000.000	/month for 3 people	Strategic Plan
Assistant Manager	Rp6.000.000	/month for 3 people	Strategic Plan
Staff	Rp3.000.000	/month for 15 people	Strategic Plan

Source: Processed Data

Asset Economic Life and Depreciation Assumptions

In this sub chapter, author will assume economic life of each asset in this project. Economic life would be assumed based on Indonesia Directorate General of Taxation and depreciation method that is used will be straight line method. Economic life of each asset and its depreciation rate in this project will be shown in the table below.

Table VII. Asset Economic Life and Depreciation

Description	Economic Life	Rate	Source
Infrastructure	20	5%	Directorate General of Taxation
Utility	20	5%	
Flock Building	20	5%	
Flock Equipment	8	12,50%	

Source: Author’s Analysis

Other Cost Assumptions

Costs that are categorized as other cost will be consisted of tax and bank interest rate. Tax rate that is used in this research will be taken from The Harmonized Tax Law (HTL) or Law No. 7/2021. Bank interest rate that is used in this research will be calculated by averaging Investment Credit Interest Rates by Bank Group data found in Central Bureau of Statistics of Indonesia from 2021 until 2023. Data that has been calculated and collected will be shown in the table below.

Table VIII. Other Cost Assumptions

Description	Rate	Source
Tax	22%	Law No. 7/2021
Bank Interest Rate	8,4%	Calculated

Source: Processed Data and Author’s Analysis



RESULT AND DISCUSSIONS

Loan Schedule

In this sub chapter, author calculated the loan schedule using Microsoft Excel. Interest during construction and debt provision cost will be capitalized as increase in asset price. Interest rate that is used in this research is 8,4%, calculated by averaging Investment Credit Interest Rates by Bank Group data found in Central Bureau of Statistics of Indonesia from 2021 until 2023 and the loan tenor in this research is 6 year including 6 month grace period. Recap of calculation will be shown in the table below.

Table IX. Loan Schedule

Year	Long Term Debt Value	Current Portion of Long-Term Debt	Interest Expense
2024	Rp239.134.442.939	Rp48.668.133.757	Rp0
2025	Rp186.378.185.946	Rp52.756.256.993	Rp24.175.416.442
2026	Rp129.190.403.365	Rp57.187.782.580	Rp20.087.293.207
2027	Rp67.198.847.048	Rp61.991.556.317	Rp15.655.767.619
2028	Rp0	Rp67.198.847.048	Rp10.851.993.883
2029	Rp0	Rp0	Rp5.644.703.152

Source: Author’s Analysis

Depreciation and Ammortization Schedule

In this sub chapter, author will calculate depreciation and amortization cost of each asset in the project. Author will be using straight line method and the rate of depreciation had been calculated in previous sub chapter. Interest during construction and debt provision cost calculated in the loan schedule will be capitalized as increase in asset value proportionally. Recap of depreciation and amortization schedule calculation will be shown in the table below.

Table X. Depreciation and Ammortization Schedule

Year	Buy Value	Depreciation	Accumulated Depreciation
2024	Rp407.066.085.825	Rp0	Rp0
2025	Rp407.066.085.825	Rp31.025.330.478	Rp31.025.330.478
2026	Rp407.066.085.825	Rp31.025.330.478	Rp62.050.660.956
2027	Rp407.066.085.825	Rp31.025.330.478	Rp93.075.991.434
2028	Rp407.066.085.825	Rp31.025.330.478	Rp124.101.321.912
2029	Rp407.066.085.825	Rp31.025.330.478	Rp155.126.652.389
2030	Rp407.066.085.825	Rp31.025.330.478	Rp186.151.982.867
2031	Rp407.066.085.825	Rp31.025.330.478	Rp217.177.313.345
2032	Rp407.066.085.825	Rp31.025.330.478	Rp248.202.643.823
2033	Rp544.780.180.232	Rp29.952.881.968	Rp278.155.525.791
2034	Rp544.780.180.232	Rp29.952.881.968	Rp308.108.407.758
2035	Rp544.780.180.232	Rp29.952.881.968	Rp338.061.289.726
2036	Rp544.780.180.232	Rp29.952.881.968	Rp368.014.171.694
2037	Rp544.780.180.232	Rp29.952.881.968	Rp397.967.053.661
2038	Rp544.780.180.232	Rp29.952.881.968	Rp427.919.935.629
2039	Rp544.780.180.232	Rp29.952.881.968	Rp457.872.817.597



2040	Rp544.780.180.232	Rp29.952.881.968	Rp487.825.699.564
2041	Rp682.494.274.639	Rp29.952.881.968	Rp517.778.581.532
2042	Rp682.494.274.639	Rp29.952.881.968	Rp547.731.463.500
2043	Rp682.494.274.639	Rp29.952.881.968	Rp577.684.345.468
2044	Rp682.494.274.639	Rp29.952.881.968	Rp607.637.227.435

Source: Author's Analysis

Income Statement

In this sub chapter, author will project company's income statement. Revenue calculated by multiplying meat produced in the year and selling price on that year. In this research, the base assumption on the quantity sold would be 100% of the meat produced that year. Recap of the calculation that has been done will be shown in the table below.

Table XI. Income Statement

Year	Revenue	COGS	Net Profit
2024	-	-	Rp0
2025	Rp621.885.239.662	Rp368.970.030.211	Rp145.450.284.982
2026	Rp647.444.723.012	Rp388.021.144.225	Rp153.355.225.661
2027	Rp674.054.701.128	Rp403.835.615.401	Rp164.857.178.208
2028	Rp701.758.349.344	Rp420.299.461.436	Rp176.980.616.641
2029	Rp730.600.617.502	Rp437.439.353.641	Rp189.763.554.234
2030	Rp760.628.302.881	Rp455.283.058.975	Rp203.246.613.348
2031	Rp791.890.126.130	Rp473.859.485.064	Rp212.700.511.156
2032	Rp824.436.810.314	Rp493.198.727.067	Rp222.543.490.819
2033	Rp858.321.163.218	Rp513.332.116.460	Rp233.628.069.240
2034	Rp893.598.163.026	Rp534.292.271.839	Rp244.297.892.170
2035	Rp930.325.047.526	Rp556.113.151.794	Rp255.406.820.314
2036	Rp968.561.406.980	Rp578.830.109.973	Rp266.972.918.159
2037	Rp1.008.369.280.807	Rp602.479.952.392	Rp279.014.993.165
2038	Rp1.049.813.258.248	Rp627.100.997.111	Rp291.552.626.307
2039	Rp1.092.960.583.162	Rp652.733.136.357	Rp304.606.203.891
2040	Rp1.137.881.263.130	Rp679.417.901.204	Rp318.196.950.666
2041	Rp1.184.648.183.044	Rp707.198.528.905	Rp332.346.964.299
2042	Rp1.233.337.223.367	Rp736.120.032.992	Rp347.079.251.274
2043	Rp1.284.027.383.248	Rp766.229.276.263	Rp362.417.764.257
2044	Rp1.336.800.908.699	Rp797.575.046.759	Rp378.387.441.010

Source: Author's Analysis

Net Working Capital

In this sub chapter, author will project company's net working capital which calculated by subtracting the total of account receivables and inventories with the total of accrued payables and accruals. Net working capital represents the difference between



a company's current assets and its current liabilities. It provides insight into a company's short-term liquidity and its ability to meet its short-term financial obligations. The recap of the calculation will be shown in the table below.

Table XII. Net Working Capital

Year	Current Asset	Current Liabilities	Working Capital
2024	Rp43.760.276.197	Rp48.668.133.757	-Rp4.907.857.561
2025	Rp193.220.381.929	Rp21.652.624.029	Rp171.567.757.899
2026	Rp325.961.500.513	Rp22.769.443.468	Rp303.192.057.045
2027	Rp465.585.474.750	Rp23.698.691.600	Rp441.886.783.150
2028	Rp612.567.305.781	Rp24.666.131.829	Rp587.901.173.952
2029	Rp767.164.545.468	Rp25.673.333.853	Rp741.491.211.616
2030	Rp1.002.485.087.320	Rp26.721.931.879	Rp975.763.155.442
2031	Rp1.247.302.624.359	Rp27.813.627.284	Rp1.219.488.997.076
2032	Rp1.502.008.009.743	Rp28.950.191.370	Rp1.473.057.818.373
2033	Rp1.629.058.143.413	Rp30.133.468.240	Rp1.598.924.675.173
2034	Rp1.904.540.827.101	Rp31.365.377.790	Rp1.873.175.449.311
2035	Rp2.191.183.070.414	Rp32.647.918.822	Rp2.158.535.151.592
2036	Rp2.489.444.124.009	Rp33.983.172.290	Rp2.455.460.951.719
2037	Rp2.799.802.131.527	Rp35.373.304.676	Rp2.764.428.826.851
2038	Rp3.122.754.906.629	Rp36.820.571.503	Rp3.085.934.335.126
2039	Rp3.458.820.741.982	Rp38.327.320.997	Rp3.420.493.420.985
2040	Rp3.808.539.251.513	Rp39.895.997.894	Rp3.768.643.253.619
2041	Rp4.034.758.152.891	Rp41.529.147.413	Rp3.993.229.005.478
2042	Rp4.413.490.558.096	Rp43.229.419.376	Rp4.370.261.138.720
2043	Rp4.807.631.357.462	Rp44.999.572.517	Rp4.762.631.784.945
2044	Rp5.217.814.586.875	Rp46.842.478.953	Rp5.170.972.107.922

Source: Author’s Analysis

WACC Calculation

First step in calculating weighted average cost of capital is calculating its cost of equity. In order to calculate cost of equity, author collected data through secondary method such as risk-free rate data from IBPA 10 year Government Bond, levered beta through US industry beta because author cannot find the company’s beta from yahoo finance, market return through Jakarta Stock Exchange and then analyze it, but because the market return data is lower than the risk free rate, author try to find another data that is market risk premium which author find in Damodaran market risk premium. The result of the calculation will be shown in the table below.

Table XIII. Cost of Equity Calculation

Levered Beta	US Industry Beta	1,14
Debt to Equity Ratio	Calculated	70%
Monthly Market Return	Calculated	0,44%



Cost of Equity Calculation		
Unlevered Beta	US Industry Beta	0,91
		2,413165425
Project Debt to Equity Ratio	Calculated	
Levered Beta	Calculated	1,39
Risk-Free Rate	IBPA 10 year gov bond	7,18%
Market Return	Calculated	5,55%
Equity Risk Premium	Damodaran	7,89%
Cost of Equity	Calculated	14,36%

Source: Author's Analysis

The next step is calculating cost of debt and then calculating WACC. All data that is needed to calculate cost of debt and WACC has been found previously. Result of the calculation will be shown in the table below.

Table XIV. Cost of Equity Calculation

Weight of Capital				
Long-Term Debt	Strategic Plan	Rp287.802.576.696		
Equity	Strategic Plan	Rp119.263.509.129		
Total		Rp407.066.085.825		
WACC Calculation			Weight	Cost
Cost of Debt (After Tax)	Calculated	70,70%	6,55%	4,63%
Cost of Equity	Calculated	29,30%	14,36%	4,21%
WACC	Calculated	8,84%		

Source: Author's Analysis

NPV, IRR, Payback Period, and Profitability Index Calculation

First step in calculating NPV, IRR, Payback Period, and Profitability Index, is determining project's initial cashflow. To determine project's initial cashflow, author will use project's fixed capital expenditure data that has been collected. Summary of the initial cashflow will be shown in the table down below.

Table XV. Operating Cashflow

Initial Cashflow	
Land	(Rp6.000.000.000)
Infrastruture	(Rp20.679.068.466)
Utility	(Rp57.127.307.816)
Construction of Flock	(Rp176.966.027.054)
Supporting Equipment and Instalation	(Rp146.293.682.489)
Total Initial Cashflow	(Rp407.066.085.825)

Source: Author's Analysis

After determining project's initial cashflow, author will project project's operating cashflow. Author project operating cashflow by adjusting project's net profit with interest expense and depreciation cost. Summary of project's operating cashflow will be shown in the table down below.



Table XVI. Operating Cashflow

Year	Operating Cashflow	Accumulated Cashflow
2025	Rp151.251.893.190	-Rp255.814.192.635
2026	Rp198.115.299.804	-Rp57.698.892.831
2027	Rp206.206.361.717	Rp148.507.468.886
2028	Rp214.505.274.396	Rp363.012.743.282
2029	Rp223.145.754.351	Rp586.158.497.633
2030	Rp232.141.854.455	Rp818.300.352.088
2031	Rp241.508.205.590	Rp1.059.808.557.677
2032	Rp251.260.040.411	Rp1.311.068.598.088
2033	Rp123.463.185.020	Rp1.434.531.783.109
2034	Rp271.748.311.447	Rp1.706.280.094.556
2035	Rp282.754.388.374	Rp1.989.034.482.930
2036	Rp294.213.407.818	Rp2.283.247.890.749
2037	Rp306.144.003.500	Rp2.589.391.894.249
2038	Rp318.565.575.518	Rp2.907.957.469.767
2039	Rp331.498.321.866	Rp3.239.455.791.633
2040	Rp344.963.271.241	Rp3.584.419.062.874
2041	Rp221.268.222.794	Rp3.805.687.285.668
2042	Rp373.578.253.731	Rp4.179.265.539.398
2043	Rp388.774.812.266	Rp4.568.040.351.664
2044	Rp404.596.700.243	Rp4.972.637.051.907

Source: Author’s Analysis

After calculating project’s operating cashflow, author will calculate project’s terminal cashflow. Terminal cashflow is the after-tax nonoperating cashflow occurring in the final year of the project. It is usually attributable to liquidation of the project (Gitman, 2014). Summary of project’s terminal cashflow is shown in the table down below.

Table XVI. NPV, IRR, Payback Period, and PI

Terminal Cashflow	
Salvage Value	Rp74.857.047.203
Liquidation of Final Current Assets	Rp5.217.814.586.875
Paid off Final Current Liabilities	(Rp46.842.478.953)
	Rp5.245.829.155.125
Tax	Rp1.154.082.414.128
Total Terminal Cashflow	Rp4.091.746.740.998

Source: Author’s Analysis

After calculating all cashflows, author calculate NPV with “=NPV” formula in Microsoft Excel, and then to calculate IRR author use “=IRR” formula in Microsoft Excel. And then to calculate payback period, author simply use “=countif” formula with criteria accumulated cashflow lower than 0 and then add it by 1. Lastly to calculate profitability index author simply divide project’s NPV with its initial cost. Summary of the calculation will be shown in the table below.



Table XVII. NPV, IRR, Payback Period, and PI

NPV	Rp2.583.096.880.095,80
IRR	47,66%
PP	4
PI	6,73

Source: Author’s Analysis

Sensitivity Analysis

To conduct sensitivity analysis, author will increase and decrease each variable by -20% and +20% and then analyze the difference of NPV that it affects. And then author organized it from the highest range of NPV changes to the lowest. Result of the analysis will be shown in the figure below.

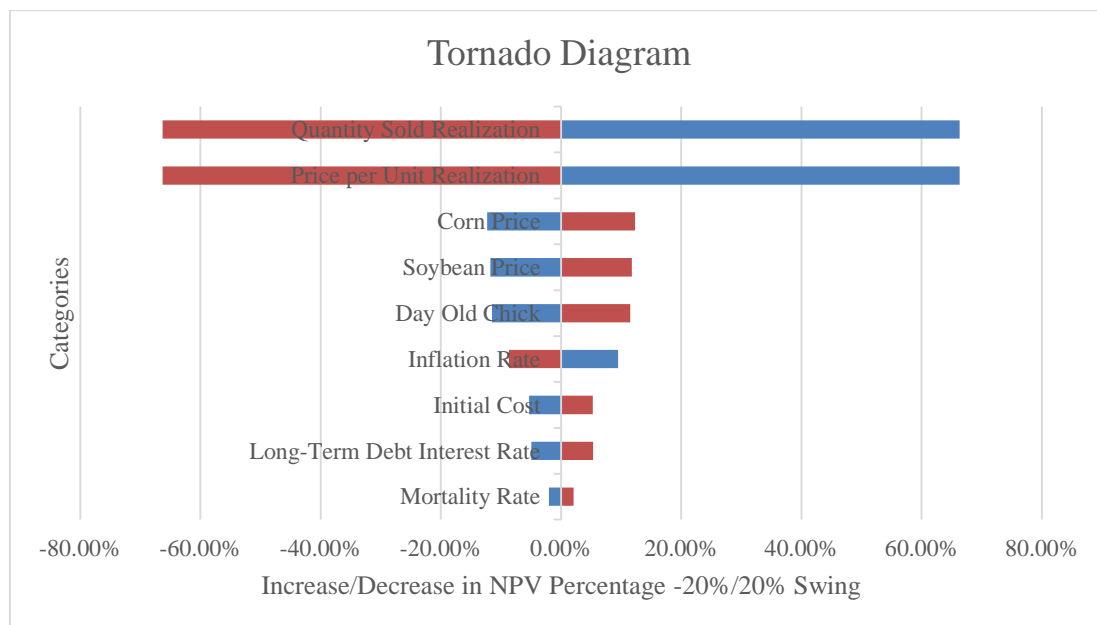


Figure I. Tornado Diagram

Source: Author’s Analysis

CONCLUSION

From the result of analysis that has been done, author can conclude that the project that is planned by PT.XYZ is feasible as the project has Rp2.583.096.880.095,80 NPV value which is >0, IRR of 47,66% which is greater than the discount rate, payback period of 4 year less than the loan tenor which ends in 5 year, and profitability index of 6,73 which is greater than 1.0.

From the sensitivity analysis that has been done, author concluded that variable that affect NPV of the project the most to the least are quantity sold realization, price unit realization, corn price, soybean price, day old chick price, initial cost, long term debt interest rate, inflation rate, and last but not least is its mortality rate. From the result of sensitivity analysis, author can identify and narrow potential risk that can occur in the project into market fluctuation risk, disease outbreak, and construction cost overrun risk.

After knowing the result of analysis in this research, author summarized some method to further reduce risk of the project such as :

1. Form Strategic Partnerships

The first recommendation involves the proactive management of market fluctuation risks through the establishment of strategic partnerships. Specifically, the proposed partnerships are envisaged with key suppliers of raw materials, including feed



suppliers and day-old chick providers. This strategic alliance aims to leverage the company's long-term commitment to purchasing substantial quantities, thereby securing a more stable supply chain and potentially lowering costs. Additionally, forming partnerships with wholesale buyers is advised, anticipating that the product will experience increased market traction and be seamlessly distributed in larger quantities. By strategically aligning with both input suppliers and wholesale buyers, the company positions itself to navigate market uncertainties with resilience, ensuring a more robust and sustainable business model.

2. Insurance Coverage

Securing comprehensive insurance coverage emerges as the second crucial recommendation for safeguarding the company's interests. Specifically, the proposal suggests implementing livestock insurance to shield the business from potential risks associated with diseases and accidents that may impact the company's livestock. By incorporating this insurance solution, the company can effectively mitigate the adverse effects of unforeseen events, ensuring resilience in the face of challenges and safeguarding its assets. This strategic measure serves as a proactive step in fortifying the company's financial stability and operational continuity, offering a layer of protection against the unpredictable nature of livestock-related uncertainties.

3. Advanced Technology Adoption

The third pivotal recommendation involves the integration of cutting-edge technologies to elevate operational efficiency and risk management within the poultry farming enterprise. Specifically, the proposal suggests the implementation of advanced technologies such as Internet of Things (IoT) sensors for the real-time monitoring of poultry health. This proactive approach enables swift detection and response to potential health issues, fostering a healthier and more resilient flock. Additionally, the adoption of automated biosecurity systems serves to fortify disease prevention measures, mitigating the risk of outbreaks and safeguarding the overall well-being of the poultry. Furthermore, the incorporation of data analytics into the operational framework enhances the company's ability to detect and manage risks effectively, providing valuable insights for informed decision-making. By embracing these technological advancements, the company can establish itself at the forefront of innovation, ensuring a more sustainable and adaptive approach to poultry farming in the face of dynamic challenges.

4. Hiring Construction Supervising Consultants

The fourth crucial recommendation entails contemplating the engagement of construction supervising consultants, especially if the company lacks an internally dedicated division for project oversight. This strategic move is aimed at ensuring the seamless execution of the project without succumbing to cost overruns. By enlisting the expertise of construction supervising consultants, the company gains access to specialized professionals who can diligently oversee and manage the various facets of the construction process. Their role extends beyond mere supervision, encompassing the critical task of averting potential budgetary excesses and guaranteeing the efficient utilization of resources. This external perspective brings a wealth of experience and knowledge, serving as a valuable asset in navigating the complexities of construction projects and safeguarding the company's interests. Embracing this recommendation is pivotal for maintaining project integrity and achieving successful outcomes within defined budgetary constraints.

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