



## Proposed Capital Budgeting: Should PT.FST Close its Kelambu Division?

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**ABSTRACT:** In 2021, the manufacturing industry is Indonesia's most significant contributor to its Gross Domestic Product (GDP). Within the manufacturing industry, there is a sub-industry called the textile industry. The textile industry in Indonesia is highly fragmented. For instance, there are three niche textile markets: textile for households, textile for clothing, and textile for agriculture. The three segments have different growth of 4%, 7.5%, and 5%, respectively, and this difference in growth rate will create a dilemma for companies. For instance, companies must decide which segment needed to be perused or avoid since each segment will have its opportunities and threats.

PT. FST also faces this dilemma. The differences in each segment's growth rate are reflected by the company's sales growth of each product. The sales of plastic products Waring and Benang growth rates are 34% and 52% five years CAGR, respectively. Those are substantial growth compared to the textile products of Kelambu with only 23% five years CAGR. From there, the company's owner and CEO see a shift in the growth of products sold, from textile products to plastic products. To capture the shifts in demand within the market, he decided to close the Kelambu division to make the company leaner and will be able to focus its resources on the products that will generate revenue the most.

From capital budgeting analysis, the plan of shutting down the Kelambu division will result in a faster payback period of 7.2 years compared to 8 years for the regular cash flow and 8.05 years compared to 8.12 years for the regular cash flow the discounted cash flows. More importantly, it generates a higher NPV of IDR 1,087 bio than IDR 976 bio. In addition, the plan also has a higher Profitability Index and IRR of 6.04 and 25% compared to 5.01 and 22%. From risk analysis, the expected value of the project's is IDR 1,457 bio, with a probability of NPV less than zero is 8%.

Lastly, this final project contributes to the literature by providing an alternative framework on how to use capital budgeting techniques to compare two expansion plans or closing down divisions within a company. Moreover, other textile industry players, especially SMEs could also refer to this final project if they face a similar dilemma.

**KEYWORDS:** Capital Budgeting, IRR, Monte Carlo Simulation, NPV, Payback Period.

### INTRODUCTION

One of the most significant contributors to Indonesia's 2021 Gross Domestic Product (GDP) is the country's manufacturing industry. According to the Indonesia central agency of statistics, BPS (2022) stated that the manufacturing industry contributes around IDR 2,284 trillion to the GDP or about 20.55% of the country's GDP. In the manufacturing industry, there is one subsector called the textile industry. In 2021, the textile industry contributed around IDR 127 trillion or 1.15% to Indonesia's GDP or about 6.12% of the non-oil and gas manufacturing industry and became the top 5 subsectors in the mentioned industry. One main issue in the industry is it is highly fragmented. For instance, in their paper, Fauzi et al. (2019) mentioned that the industry is divided into ten segments. And each segment is also highly fragmented and has a different growth rate, one player that faces difficulties in this very fragmented industry is PT FST.

PT FST is one of the players in the textile industry that has business operations in manufacturing three product lines, Kelambu, Waring, and Benang. Each of the company's products serves three different niches within the textile industry. Kelambu will serve the textile for the households segment, Waring will serve the textile for agriculture, and Benang will serve the textile for the clothing segment. Currently, every three segments have different growth of 4%, 7.5%, and 5%, respectively. This different growth will require the company to decide how to proceed with its business since each segment will have its opportunities and threats.

The differences in each niche growth rate are also reflected by the company's sales growth for each product. The sales of plastic products Waring and Benang grew from IDR 14 billion and IDR 55 billion in 2017 to IDR 75 billion and IDR 181 billion in 2021, or



34% and 52% five years CAGR, respectively. Those would be massive growth if we compared it to the textile products of Kelambu. In 2017 the sales of Kelambu were IDR 22 billion, then it grew to IDR 52 billion in 2021, or a 23% five years CAGR. From there, the company's owner and CEO see a shift in the growth of products sold, from textile products to plastic products.

In order to capture the shifts in demand within the market, the company's owner and CEO decided to close down the Kelambu division in order to make the company leaner and will be able to focus their resources on the products that will generate revenue the most. For that reason, this paper is written with the objectives of capital budgeting for the company's investment plan and determining whether the company should close the Kelambu division and focus its resources on the Benang and Waring divisions.

## RESEARCH METHODOLOGY

This paper will use the quantitative method to solve the research question. The quantitative method used is capital budgeting and Montecarlo simulation. The capital budgeting method required several data to be collected. The data mentioned include historical financial data such as financial statements, production data, and machinery data. At the same time, the research design for this paper will be as follows. First, the pro forma income statement, balance sheet, and cash flows for the next ten years are prepared for each business proposal, alongside the free cash flow for the firm calculation. Next, the free cash flow to the firm is assessed using the capital budgeting method. The selected business solution was then further analyzed using sensitivity analysis and Montecarlo simulation. Finally, a go decision on the business proposal is made if the analysis result is favorable. Further, the detailed explanation of capital budgeting conceptual framework above will be discussed below.

### I. Capital Budgeting

Capital budgeting is the process of evaluating and selecting long-term investments that are consistent with the firm's goal of maximizing owners' wealth (Gitman, Zutter, 2015). The basis of capital budgeting is generating a free cash flow statement. Free cash flow can be defined as excess cash inflow required to fund a project (Shaym, Mollie, 2017). In the same book, Gitman & Zutter (2015) explained that one way to find a company's cash flow is by calculating the free cash flow to the firm (FCFF). The formula for FCFF is as follows.

$$FCFF = [EBIT \times (1 - T) + Depreciation] - [Change in net fixed assets + Depreciation] - [Change in current assets - Change in (accounts payable + accruals)]$$

After acquiring the cash flow, Gitman and Zutter (2015) explained that we can do several capital budgeting techniques. The technique mentioned is as follows; Payback period, Present Net Value, profitability index, and Internal rate of return. The payback period is the period or the amount of time for a firm to recover its initial investment in a project. The payback period can be used to make an accept-reject decision. For a mixed stream of cash inflows, such as a different amount or value, the yearly cash inflows must be accumulated until the initial investment is recovered.

$$Payback\ period = annual\ cash\ inflow \div initial\ investment$$

The next capital budgeting technique is Net Present Value (NPV). This technique is found by finding the present value of its cash inflows discounted at a rate equal to the firm's cost of capital and subtracting it from the project's initial investment. NPV could also be used to make an accept-reject decision. The decision criteria are as follows; if the NPV is greater than zero dollars, accept the project because the firm will earn a return greater than its cost of capital.

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

The interpretation of r rate as the cost of capital is, in their book, Gitman and Zutter (2015), there are several types of costs of capital. There is the cost of debt, the cost of capital, and the weighted average of the cost of capital (WACC). In his paper Damodaran (2006) explained that the cost of debt is the rate that the company can make long-term borrowings that are composed of the risk-free rate, country default spread, and company default spread, which are corrected for the tax benefit. In other words, the cost of debt can be calculated using the following formula.

$$r_d = Risk\ free\ rate + Country\ Default\ Spread + Company\ Default\ Spread$$



The company default spread for unlisted company, it can be derived from the synthetic rating. The synthetic rating can be derived by matching the company's interest coverage ratio with the default spread synthetic rating. Then, the cost of debt should be adjusted with the tax shield as follows

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

The next cost of capital is the cost of equity. It can be calculated using the Capital Asset Pricing Model (CAPM). Describes the relationship between the required return and the non-diversifiable risk of the firm as measured by the beta coefficient.

$$r_s = R_f + [\beta \times (r_m - R_f)]$$

$R_f = \text{risk free rate}, r_m = \text{market return}$

We can then combine the two costs to become the WACC

$$r_a = w_s \times r_s + w_d \times (r_d \times (1 - T))$$

The next capital budgeting technique is the Profitability Index (PI). PI is a modification of NPV. In NPV, we subtract the present value of its cash inflows discounted at a rate equal to the firm's cost of capital from the project's initial investment. In PI, we divide the present value of its cash inflows discounted at a rate equal to the firm's cost of capital by the project's initial investment. The decision rule of PI is to invest in a project with a PI greater than one. A PI greater than 1 indicated that the present value of cash inflows is greater than the initial cash outflow. The PI can be calculated using the following equation.

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

The last capital budgeting technique is the Internal rate of return (IRR). The discount rate will make the NPV of an investment project to be zero dollars. Because the present value of cash inflows equals the initial investment, IRR becomes the rate of return the firm will earn if it invests in the project and receives the given cash inflows. The decision criteria of IRR are as follows, if the IRR is greater than the cost of capital, then we should accept the project, while if the IRR is less than the cost of capital, we should reject the project. To calculate IRR, we can use the same formula as NPV and make the NPV zero, and find the IRR.

$$0 = \sum_{t=1}^n \frac{FCFF}{(1 + IRR)^t} - CF_0$$

## II. Montecarlo Simulation

Scenario analysis is the process of estimating the expected cash flows and asset values of a project under various scenarios. The analysis objective is to get a better view of the risk's effect on the project's value. The step-in scenario analysis is as follows. First, we need to identify the input factors of the scenarios. Next, we need to determine the number of scenarios to analyze for each factor. The third step is to estimate the asset cash flows under each scenario. Finally, we need to add the probabilities component to each scenario to calculate the project's expected value. To aid with the probability component, we can use Monte Carlo simulation. In Monte Carlo simulation, we can generate one outcome from each scenario to generate a unique set of cash flows and values. After creating many simulations, we can derive a distribution for the value of an investment or an asset that will reflect the underlying uncertainty we face in estimating the inputs to the valuation (Damodaran, 2006).

## FINDINGS AND ARGUMENTS

The First assumption to be discussed is the weighted average cost of capital (WACC). As mentioned, the capital structure for this project is only using debt. Therefore the calculation of WACC is summarized in the below table. The weight of cost of debt within the company will be 100%. For the cost of debt, referring to the equation in chapter II regarding the cost of debt, the calculation of the cost of debt is as follows. First, the risk-free rate is acquired from a 10-year Indonesian government bond of 7.16% (PHEI, 2022). Next, the country default spread for Indonesia is at 1.62% (Damodaran, 2022). And lastly, the company default spread is calculated using a synthetic rating. Currently, the company's interest coverage ratio is at 5.16 and referring to the synthetic rating



from Damodaran (2022), the company's default spread is at 1.29%. Adding all the components above, the company's cost of debt is at 10.07%. Factoring in the 22% tax ratio, the after-tax cost of debt is at 7.86%, and the company's WACC is at 7.86%.

**I. Running Three division**

To test the proposed business solution of shutting down the Kelambu division, the plan will be compared against the plan of keeping all three divisions running as usual. This alternative is still considered a likely option because the revenue from the Kelambu division is still considered significant. In addition, there will be less disruption for the company in their daily operation from the factory renovation, machinery purchase, and training for former Kelambu workers to Waring and Benang divisions. The EBIT is derived from the EBIT formula mentioned above. The growth of the revenue is projected to be 20% for Benang, 40% for Waring, 8% for Kelambu in the first five years, and 1.25% for all products in the subsequent years. The total investment that the company will make for this scenario is IDR 106,065,000,000, which will be drawdown in several years. The above assumption will generate the below FCFF.

FREE CASH FLOW TO THE FIRM (in millions IDR)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Earnings Before Interest and Taxes (EBIT)	29.875	49.114	75.281	112.534	166.806	173.262	179.952	186.867	194.051	201.495
Tax of EBIT	6.572	10.805	16.562	24.758	36.697	38.118	39.589	41.111	42.691	44.329
<b>Net Operating Profit After Tax</b>	<b>23.302</b>	<b>38.309</b>	<b>58.719</b>	<b>87.777</b>	<b>130.109</b>	<b>135.144</b>	<b>140.363</b>	<b>145.756</b>	<b>151.360</b>	<b>157.166</b>
Depreciation & Amortization	1.009	2.048	4.065	6.075	6.632	6.632	6.632	6.649	6.649	6.649
<b>Operating Cash Flow</b>	<b>24.311</b>	<b>40.357</b>	<b>62.784</b>	<b>93.851</b>	<b>136.740</b>	<b>141.776</b>	<b>146.994</b>	<b>152.406</b>	<b>158.009</b>	<b>163.815</b>
Changes in Current Asset	251.127	66.942	111.737	154.966	215.752	13.228	28.260	29.242	30.259	31.312
Changes in Account Payable and Accuals	111	18.381	6.051	8.350	11.573	16.104	2.092	2.165	2.240	2.318
Net Current Asset Investment	251.017	48.561	105.686	146.616	204.180	(2.877)	26.167	27.077	28.019	28.994
Net Fixed Asset Investment	16.810	17.324	33.612	33.500	9.282	-	-	291	-	0
<b>Free Cash Flow to the Firm</b>	<b>(243.516)</b>	<b>(25.528)</b>	<b>(76.513)</b>	<b>(86.264)</b>	<b>(76.721)</b>	<b>144.653</b>	<b>120.827</b>	<b>125.037</b>	<b>129.990</b>	<b>134.821</b>
<b>Terminal Cash Flow</b>										<b>2.065.690</b>
<b>Total Cash Flow</b>	<b>(243.516)</b>	<b>(25.528)</b>	<b>(76.513)</b>	<b>(86.264)</b>	<b>(76.721)</b>	<b>144.653</b>	<b>120.827</b>	<b>125.037</b>	<b>129.990</b>	<b>2.200.511</b>
WACC	7,86%									
PV of Cash Flow	(218.694,88)	(9.376,26)	(50.559,84)	(54.665,43)	(43.710,54)	111.499,36	88.434,91	84.684,81	81.420,91	1.275.135,58
Accumulated PV of Cash Flow	(218.694,88)	(228.071,14)	(278.630,97)	(333.296,40)	(377.006,95)	(265.507,58)	(177.072,67)	(92.387,86)	(10.966,95)	1.264.168,63
<b>Payback Period</b>	<b>7,91</b>									
<b>Discounted Payback Period</b>	<b>8,12</b>									
<b>Net Present Value</b>	<b>975.940,43</b>									
<b>Profitability Index</b>	<b>5,01</b>									
<b>IRR</b>	<b>22,43%</b>									

**II. Running Three division (Shutting Down Kelambu Division)**

The second alternative and central business solution proposal are to shut down the Kelambu division. Sell the old asset and repurpose the space and resources from the Kelambu division to expand for waring and Benang division. As mentioned, this alternative will make the company leaner and save costs such as marketing, depreciation, and interest expenses. Similarly, The EBIT for this plan is also derived from the EBIT formula mentioned above. The growth of the revenue is projected to be 20% for Benang, 40% for Waring in the first five years, and 1.25% for all products in the subsequent years. The total investment that the company will make for this scenario is IDR 104,255,000,000, which will be drawdown in several years. The above assumption will generate the below FCFF.



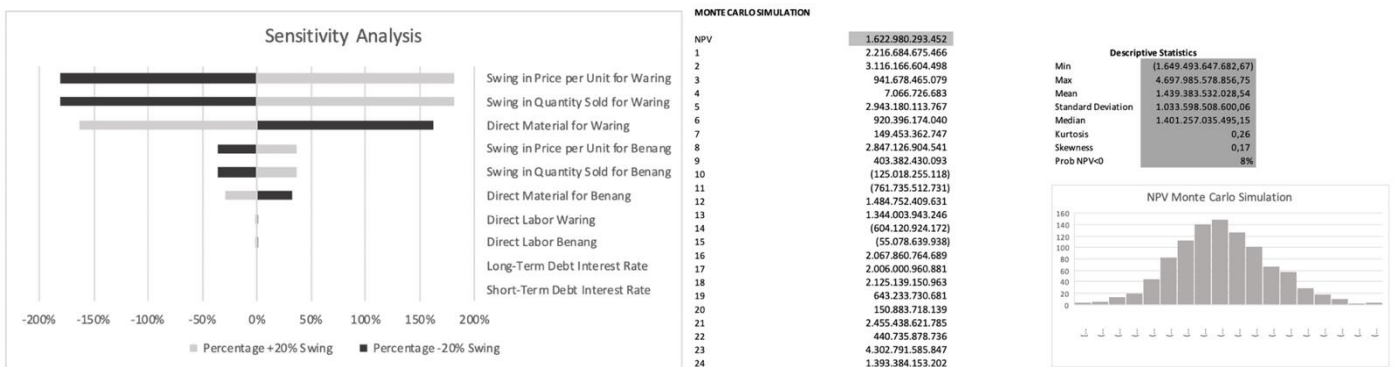


FREE CASH FLOW TO THE FIRM (in millions IDR)	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Earnings Before Interest and Taxes (EBIT)	32.235	50.810	76.381	113.248	167.519	173.863	180.436	187.243	194.294	201.598
Tax of EBIT	7.092	11.178	16.804	24.915	36.854	38.250	39.696	41.193	42.745	44.351
<b>Net Operating Profit After Tax</b>	<b>25.143</b>	<b>39.632</b>	<b>59.577</b>	<b>88.334</b>	<b>130.665</b>	<b>135.613</b>	<b>140.740</b>	<b>146.050</b>	<b>151.549</b>	<b>157.246</b>
Depreciation & Amortization	936	1.965	3.981	5.980	6.537	6.537	6.537	6.537	6.537	6.537
<b>Operating Cash Flow</b>	<b>26.079</b>	<b>41.597</b>	<b>63.559</b>	<b>94.314</b>	<b>137.202</b>	<b>142.151</b>	<b>147.277</b>	<b>152.587</b>	<b>158.087</b>	<b>163.783</b>
Changes in Current Asset	211.901	59.419	102.706	144.094	202.664	10.490	25.427	26.312	27.228	28.175
Changes in Account Payable and Accruals	92	18.400	6.051	8.350	11.573	16.104	2.092	2.165	2.240	2.318
Net Current Asset Investment	211.810	41.019	96.655	135.745	191.091	(5.615)	23.334	24.147	24.988	25.858
Net Fixed Asset Investment	15.600	17.145	33.612	33.313	9.282	-	-	0	-	-
<b>Free Cash Flow to the Firm</b>	<b>(201.330)</b>	<b>(16.568)</b>	<b>(66.708)</b>	<b>(74.744)</b>	<b>(63.171)</b>	<b>147.765</b>	<b>123.942</b>	<b>128.440</b>	<b>133.099</b>	<b>137.926</b>
<b>Terminal Cash Flow</b>										<b>2.113.259</b>
<b>Total Cash Flow</b>	<b>(201.330)</b>	<b>(16.568)</b>	<b>(66.708)</b>	<b>(74.744)</b>	<b>(63.171)</b>	<b>147.765</b>	<b>123.942</b>	<b>128.440</b>	<b>133.099</b>	<b>2.251.184</b>
<b>WACC</b>	<b>7,86%</b>									
<b>PV of Cash Flow</b>	(184.528,91)	(6.120,62)	(46.618,50)	(49.401,14)	(37.036,14)	110.372,02	87.351,09	83.812,11	80.417,10	1.259.386,25
<b>Accumulated PV of Cash Flow</b>	(184.528,91)	(190.649,53)	(237.268,03)	(286.669,17)	(323.705,31)	(213.333,29)	(125.982,21)	(42.170,09)	38.247,01	1.297.633,26
<b>Payback Period</b>	<b>7,17</b>									
<b>Discounted Payback Period</b>	<b>8,05</b>									
<b>Net Present Value</b>	<b>1.087.519,35</b>									
<b>Profitability Index</b>	<b>6,40</b>									
<b>IRR</b>	<b>25,32%</b>									

From the two figures and the capital budgeting analysis of the two plans above. The plan of shutting down the Kelambu division will result in a faster payback period of 7.17 years compared to 7.91 years for the regular cash flow and 8.05 years compared to 8.12 years for the regular cash flow and the discounted cash flows. Not only that, and more importantly, the plan for shutting down Kelambu also generates a higher NPV of IDR 1,087,519,353,086 compared to IDR 975,940,428,381. The profitability index also tells a similar view that the plan of shutting down the Kelambu division will generate a higher Profitability Index of 6.40 compared to 5.01 for all three divisions running. Lastly, the IRR for shutting down the Kelambu division is also higher at 25.32% compared to 22.43% for the three divisions. From this capital budgeting analysis, the decision to close the Kelambu division and focus its resources on Benang and Waring divisions is considered to be a correct decision.

### III. Sensitivity Analysis & Monte Carlo Simulation

After finishing the capital budgeting analysis, the paper performs a sensitivity analysis to identify risks. From the sensitivity analysis from the figure below, it can be seen that there are six sensitive variables for the plan to shut down the Kelambu division. The mentioned sensitive variables are as follows, starting from the most sensitive to the least sensitive. Selling price for Waring, quantity sold for Waring, the direct material price for Waring, the selling price for Benang, quantity sold for Benang, and direct material price for Benang. The variables are considered sensitive because when the variables increase or decrease by 20%, it will change the NPV by the absolute percentage of 362%, 362%, 326%, 73%, 73%, and 62%, respectively. To assess the risk factor further, a Montecarlo simulation is performed. From the simulation figure below, it can be seen from the descriptive statistics that the simulation produces a normally distributed probability. Furthermore, the mean or expected value of the project NPV is IDR 1,439,938,532,028. From the simulation, it is also can be seen that the probability of NPV being less than zero is 8%.





## CONCLUSION

From capital budgeting analysis, the plan of shutting down the Kelambu division will result in a faster payback period of 7.17 years compared to 7.91 years for the regular cash flow and 7.5 years compared to 8.0 years for the regular cash flow the discounted cash flows. More importantly, it generates a higher NPV of IDR 1,087 bio than IDR 976 mio. In addition, the plan also has a higher Profitability Index and IRR of 6.40 and 25.32% compared to 5.01 and 22.43% from risk assessment of sensitivity analysis and Montecarlo simulation. It can be seen that the probability of NPV being less than zero is 8%, with six sensitive variables for the plan to shut down the Kelambu division.

The results above recommended PT FST to close the Kelambu division. However, PT FST must pay more attention to the six sensitive variables. The big NPV changes from of Selling price for Waring, quantity sold for Waring, and direct material price for Waring suggested that the company must have to fulfill its sales plan and maintain its raw materials supply and costs. Lastly, this final project contributes to the literature by providing an alternative framework on how to use capital budgeting techniques to compare two expansion plans or closing down divisions within a company. Moreover, other textile industry players, especially SMEs could also refer to this final project if they face a similar dilemma.

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