

Economic Value-Added Creation by Optimizing Capital Structure in Project Finance

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ARTICLE INFO

Keywords:

Economic Value Added
Project Finance
NOPAT
Balance sheet
WACC
ROIC

ABSTRACT

Infrastructure Projects are large investment by the public and/or private sector that required enormous financial resource commitment to build physical asset and facilities needed for economic development so that the company need project financing to support with. Project finance is based on debt repayment from project companies' revenue and not on the sponsors or the developer's balance sheet, so the project companies should assure the cash flow is sufficient for debt repayment and dividend payment. Beside that investors still have to analyze the value created in that project with highest positive Economic Value Added. Net Operating Profit After Tax (NOPAT) need to cover cost of invested capital to create value so that the ratio of NOPAT to total Project Cost (Return on Invested Capital) is should be more than the weighted average cost of capital (WACC). The capital structure doesn't have an optimum weight and cost as long as the Return on Invested Capital (ROIC) higher than WACC.

1. Introduction

1.1. Electricity Supply Acceleration Program

In 2016 Government of Indonesia commit to fulfill the electricity demand equitably and prevail in Indonesia, Government of Indonesia ("GOI") produce the Presidential Regulation ("Perpres") of The Republic of Indonesia Number 4/2016 regarding The Electricity Infrastructure Acceleration that the infrastructure of electricity should develop generation that reach 35.000 MW and 46.000 km for the Transmission and also prioritize the use of renewable energy to support the to reduce global warming. This Commitment also represent in Electricity Supply Business Plan 2017-2025, 2018-2026, and 2019-2027. Concerning the Electricity Infrastructure Acceleration, GOI intensify that commitment by developing the Committee for Acceleration of Priority Infrastructure Delivery (KPPIP) regulated in Perpres Number 122/2016 amendment from Number 75/2014 to overcome infrastructure deficit in previous year and reach the economic growth. Regulation of the President of the Republic of Indonesia Number 5 of 2010 Regarding the National Medium Term-Development Plan (RPJMN) 2015 – 2019 is arrange with the emphasizing in development acceleration. Based on Perpres 75 of 2014 the KPPIP has 6 (six) priority mandate encompass of (1) Determining and controlling the policy and strategy of priority infrastructure supply acceleration, (2) Managing and monitoring the implementation of the priority infrastructure supply acceleration, (3) Facilitating the improvement of state apparatus associated with the priority infrastructure supply acceleration, (4) Determining quality standard of feasibility evaluation, (5) Facilitating the preparation of priority infrastructure, (6) Debottlenecking the priority infrastructure problem.

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Table 1.
KPPIP 1st Semester in 2019 Report

No	Project	Investment Cost (Rp billion)	Financing Scheme
1	Street and Bridge	336.838	Loan and Government Fund
2	Transportation	278.995	Loan and Government Fund
3	Telecommunication	5.840	Loan and Government Fund
4	Electricity	612.020	Loan and Government Fund
5	Energy	1.188.848	Loan and Government Fund
6	Water and Sanitation	6.031	Loan and Government Fund
7	Waste Energy	19.478	Loan and Government Fund
Total		2.448.050	

Table 1. Explain about the priority of infrastructure project in Indonesia in the KPPIP Report of 1st semester in 2019, the amount of total cost of project estimated around Rp2.488,05 trillion or equivalent to US\$ 181.3 billion (rate Rp.13.500) encompass of 7 (seven) priority project of Street and Bridge, Transportation, Telecommunication, Electricity, Energy, Water and Sanitation, and Waste Energy. It is an enormous number of infrastructure cost that should be fulfilled for GOI with a limited time, Strategy and Policy has been formed to support these matters, including Fiscal reformation, availability payment, viability gap fund, project preparation development, and tax holiday, this time one of the biggest matters is viability gap fund. GOI also produce several regulations, Economic Policy Packet, to create a conducive investment ecosystem. Indonesia Government also develop strategy to overcome viability gap fund by project financing. Project finance is expected to be executed as soon as possible and with the compliance concept.

1.2. Project Finance

Project finance is not a stand-alone function based on contract finance or legal engineering as it being treated in the current paradigm. It has been developed to advanced levels for the primary purpose of facilitating new project and business development activities with the nonrecourse aspect as an ancillary factor. It should be treated as a part of new business development with its focus on striving to maintain or obtain competitive advantage. A key objective of project finance is to minimize or avoid uncertainty. Unlike asset-based finance, where the asset value determines financing, the adequacy of project cash flow is the foundation of funding. Since infrastructure project have different types of assets and objectives, capital requirement, and risks, they get different benefit from project financing.

Project-finance structure differ between various industry sectors and from deal to deal, since each project has its own unique characteristic. So, the principles of the project finance are:

“..finite life project that the project company’s physical assets are likely to be worth much less than the debt if they are sold off after a default on the financing-and in the projects involving public infrastructure they cannot be sold anyway which has high ratio of debt to equity (“leverage of gearing”)- roughly speaking, project finance debt may cover 70-90% of the capital cost of the project..”(Yescombe, E.R. *Project Finance*. Wiley, 2009)

Hence, project finance differs from corporate finance, where loans are primarily lent against a company’s balance sheet and financial projections extrapolated from its past cash flow and profit record and when project fails, corporate lenders can still reasonably expect to be repaid. Structure of a project financing usually has two elements, first is equity, provided by investors in the project and project finance-based debt, provided by one or more groups of lenders.

The project-finance debt has first call on the project’s net operating cash flow; the investors’ return is thus more dependent on the success of the project. So as the investors are taking a

higher risk, they expect a higher return on their investment, and the reverse is true for lenders. A nexus of contracts signed by the Project Company provide support for the finance. A 'Project Agreement' is often at the center of this contractual structure. This may take two main forms: *either* an 'Offtake Contract', under which the product produced by the project will be sold on a long-term pricing formula to an 'Offtaker' or a contract with a central government department, regional or state government, county or municipality, or another public agency ('Contracting Authority' will be used to cover all of these), which gives the Project Company the right to construct the project and earn revenues from it.

Alternatively, the Project Company may sell its production in commodity markets (which may apply, for example, to power or natural-resources projects) or have a license to operate under the terms of general legislation for the industry sector (*e.g.*, a privatized port or airport, or a mobile-phone network), in both cases without an Offtake Contract or Project Agreement, as discussed further below. The Project Company usually enters into 'Sub-Contracts', which provide support for the project finance, particularly by transferring risks from the Project Company to other parties, and which also form part of the lenders' security package.

These are projects where there is an input at one end of the project, which goes through a process within the project, and emerges as an output such as; *thermal power generation, water treatment, waste incineration; and LNG (liquid natural gas) terminal*. Typical basic elements of this type of project, using coal-fired power plant as an example, are set out in figure 1.2. In this case the Project Agreement is in the form of a type of Offtake Contract, namely a Power Purchase Agreement ('PPA'), under which an electricity-distribution company purchases the project's output, *i.e.*, electricity, based on an agreed tariff. This Offtaker may be either a public- or private-sector entity, depending on whether the electricity industry is privatized in the country concerned and the project company take the supporting agreement to subcontractor which are an *Engineering Procurement and Construction Contract (EPC Contractor)* for design and construction of the power plant, *Coal-Supply Contract*, in this case a Coal-Supply Agreement under which the coal to fuel the plant is supplied and an *Operation and Maintenance Contract ('O&M Contract')* with an experienced power-plant operator. Figure 1.2 explain a lot about the stakeholder or parties that belong to the project, so that the investor should put much attention about every parties competencies' and capabilities to join to the project. Not only investor but also lender usually take a deep-dive understanding in parties joined in this project to make this project successfully at the terms of financing-service tenure.

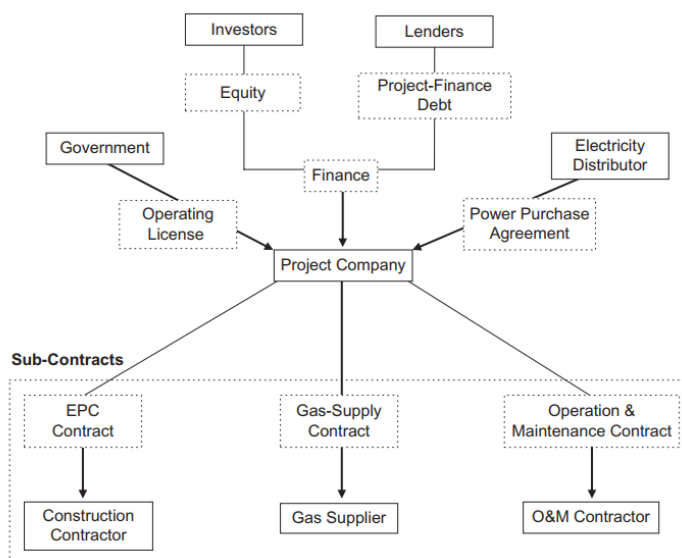


Figure 1.2. PPA Contract Structure with Project Finance

Source: Yescombe, E.R. Principles of Project Finance. Wiley, 2016

According to the fulfillment of the total investment cost of total project reach the Rp 2.448,05 trillion in Indonesia for the infrastructure project. Project finance has an important role in financing scheme to make this project happened because such large investment could not be supported with corporate finance scheme. Beside the adequacy of financing requirement, investor should aware of their capital in the project and calculate precisely about the rate of required return to shareholder. *Net present value* (“NPV”) and *Internal Rate of Return* (“IRR”) is the basic effectively parameter to calculate the magnitude of return generated from the project as a percentage of investor’s equity. NPV is equal to value of the project cash flows discounted at the cost at the cost of capital. The NPV tells us how much a project contributes to shareholder wealth; the larger the NPV, the more value the project adds. IRR is equal to the discount rate that forces the Present Value of its inflows to equal its cost. The is equivalent to forcing the NPV to equal zero. The IRR is an estimate of the project’s rate of return, if this return exceeds the cost the funds used to finance the project, the difference will be an additional return (in a sense a “bonus”) that goes to the firm’s stockholders and cause the stock value. Project X has an estimated return of 15% versus a 10% cost of capital, so it provides an additional return of 5% above its cost of capital. On the other hand, if the IRR is less than cost of capital, stockholders must make up the shortfall, which will hurt the stock value. Both IRR dan NPV use Cost of Capital to generate the result, NPV use the Cost of Capital as denominator for its serial cashflow and IRR use Cost of Capital as comparison to know about the “bonus” that goes to the firm’s stockholders.

Project company need source of capital to develop project, financial management fundamental classifies the source of capital into two in general, first is Equity, second is Debt. Each of capital has cost to give to capital provider, Cost of Equity is equal to capital charge to equity provider and cost of debt is equal to capital charge to debt provider. So, if the project could make required return exceed the cost of capital, this project could create the value to all capital provider. The average total of cost of capital is called Weighted Average Cost of Capital (“WACC”). When calculating the WACC, the most concern is the capital that must be provided by investors – interest bearing debt, preferred stock, and common equity. The lowest WACC generate the highest value of NPV and the Capital component as explained before explain that combination in cost of capital is formed by cost of debt and cost of equity. Generally, Cost of debt is cheaper than cost of equity because of the risk that should be taken by equity provider so that the weight of debt is needed more than weight of equity. This is the one of the reasons why project finance is existing and fast to accelerate the execution of the infrastructure project and mostly used by more portion of debt in their capital structure to lowering their WACC and produce higher NPV and IRR.

At some point, however, the combination of increasing cost of debt and equity would begin to raise the overall WACC and lower the NPV or the firm’s value. Some Empirical test, notably by showed that leverage did indeed impact the firm’s overall cost of capital. Two and a half decades later, reflected again on the Modigliani & Miller capital structure argument that increasing as a firm’s leverage cause probability of bankruptcy also increases, and if the cost of bankruptcy is significant, the firm’s value will fall when the marginal increases in the expected value of the tax benefit from debt is overwhelmed by the expected present value of distress cost. Figure 1.2.1 shows that financial distress and agency cost are the major factors accounting for the difference between the so-called pure M&M value of the firm (with the tax subsidy) and the revised traditionalist value of the firm. The net result is an optimum point on the debt/value axis (D^*) at which at the firm’s value is maximized.

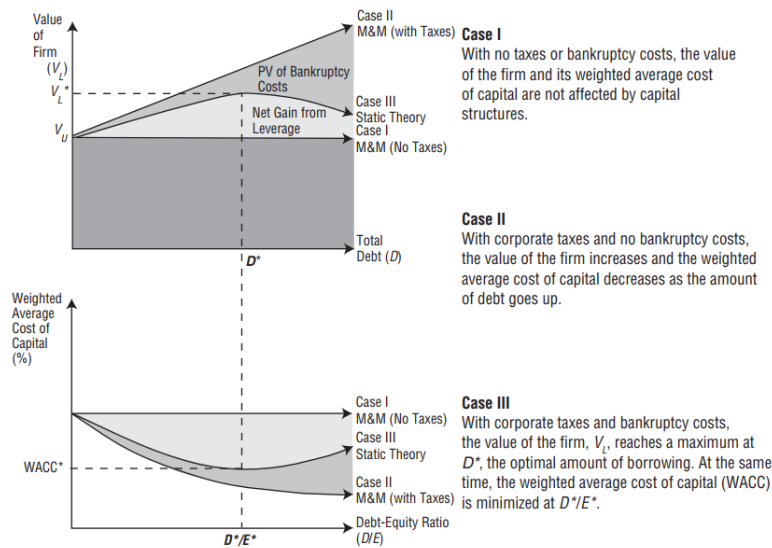


Figure 1.2.1 Net Effects of Leverage of Firm Value: M&M and Altman (1984)

Source: Edward, Altman, and Edith Hotchkiss. *Corporate Financial Distress and Bankruptcy*. Wiley, 2006

Project finance is not so different from corporate finance in perspective of profitability, only for its limitation in tenure, it takes commonly for 25 years for electricity project so that the debt provider cannot do the restructuring or do the refinancing the loan when it come worst condition. Debt holder put their much attention in how the project company generate the profit in sustainable way. Profit could classify into two different kind of name, first is accounting profit and second is economic profit. Accounting profit is the difference between total monetary revenue and total monetary cost, and is computed by using Generally Accepted Accounting Principle (GAAP), Economic Profit measure the value created by the company when the company could get the “bonus” from the spread between the NOPLAT and the cost of fund invested from capital provided (“Cost of Invested Capital”), another name of economic profit is Economic Value Added (“EVA”). EVA is not just a performance measure. It is that, but it is a lot more. EVA has an application to every facet of corporate performance management. It is a technique for improving the planning process, optimizing the investment and determining strategies. Bennet (2013) from the book of “Best Practice EVA” explain that EVA is sales less operating cost less the full cost of financing the asset from capital provider. It consolidates income efficiency and asset management into one net profit score. From this explanation, here is the example of EVA’s calculation:

Sales	\$1,250	Customer Satisfaction, Growth, and Innovation
Operating Cost	\$1,100	Pricing Power, Purchasing Power, Efficiency
NOPAT	\$150	Net Operating After Tax
Capital Cost	10% x \$1,000	Working Capital Turn, Plant Productivity
= EVA	\$ 50	

Figure 1.4 Formula of Economic Value Added

Source: G. Bennet, Stewart. *The EVA Challenge_Implementing Value Added Change in an Organization*. Mcgrawhill, 2016

The simple sample company shown above—let’s call it EnergyCo—generates \$1,250 in sales with \$1,100 of operating costs, leaving a \$150 remainder called net operating profit after taxes (NOPAT). NOPAT is a resting point partway down the EVA schedule. It is the firm’s

operating profit, net of depreciation and amortization to make it sustainable, and after taxes on the operating profit are deducted. With NOPAT now defined, we can say that EVA is equal to NOPAT less a charge for capital. When EnergyCo could make \$50 of EVA, it means that EnergyCo could give the shareholder's value of \$50 because of the operating activities generates value more than the cost that should be paid to the capital holder. From this explanation, we would like to see about the value that the project company could give to shareholders in project finance in this article, and hopefully at the end we have the conclusion if there is an EVA from the project finance scheme in infrastructure's project in Indonesia.

2. Method

According to 35 GW's programs included in Perpres Number 04/2016 about Electricity Infrastructure Acceleration Program ("Acceleration Program") and the *Electricity Supply Business Plan* (RUPTL) 2019 – 2028 that are needed to fulfill electricity demand in Indonesia, this paper classifies the power generation project using capacity range. It divides into 3 (three) range from 10 – 200 MW, 200 – 700 MW and >700 MW. From RUPTL 2019 – 2028 GOI is directed to fulfill the load growth and load deficit in certain areas. The growth of power generation capacity is also intended to enhance the electricity supply reliability by using the energy resource and renewables. This paper mention 3 (three) different projects as a evaluation basis and sample, first project is called Kaltim 5, a Mine Mouth Coal Fired Power Plant with capacity 200 MW, second project is called Jawa 3, a Combined Cycle Power Plant with capacity 800 MW and third project is called Merauke 2, a Mobile Power Plant with capacity 20 MW. All of those projects are mentioned in RUPTL 2019-2028 and part of Acceleration Program projects for Indonesia according to fulfill the electrification ratio.

The structure of the method is using the case study by 3 (three) projects as proxy for the range of capacity in RUPTL. Those projects are evaluated with the border of analysis variable to be determined as assumption. It will be a boundary and to ease the calculation and get the result with same parameter in order to produce the reasonable and obvious result not to deviate excessively. After determining the assumption of the projects, the methods continue to calculate NOPAT and EVA Analysis, ROIC Calculation and the solvency ratio analysis in order to get the result that could give the understanding about how the capital structure from project finance could create positive or negative EVA.

2.1. General Assumption

Assumption is necessary to specify the boundary of analysis point of sight and generating the result, there are a lot of variables in to be used such as: Project Cost, Capital Structure, Cost of Capital, Equivalent Availability Period (EAF) etc. Project Cost and cost of capital use data of United States Energy Information Administration (EIA) as mentioned in table 2.1 by calculating the Levelized Cost of Electricity (LCOE). Table 2.1, table 2.1.2 and table 2.1.2 are used to estimate the total investment cost for the project sample for this paper. Table 2.1.2 is the description of the implemented project for coal fired power plant in order to get imminent estimation based on KPPIP report of 1st semester of 2019.

Table 2.1
Estimated Levelized Cost of Electricity for New Generation Resource

Plant type	Capacity Factor	Levelized Capital	Levelized Fixed O&M	Levelized Variable O&M	Levelized Transmission Cost	Total System LCOE	Levelized Tax Credit	Total LCOE incl. Credit
Dispatchable Technologies								
Coal with 90% CCS	85	50.2	11.2	36.0	1.1	98.6	N/A	98.6
Coal with 90% CCS	85	50.2	11.2	36.0	1.1	98.6	N/A	98.6

Source: US. Energy Information Administration (EIA). *Levelized Cost and Levelized New Generation Cost*. 2020

Table 2.1.1

Financial Parameter and Assumption in Electricity Capacity Planning

Variables		Parameters	
1.	Debt fraction	60%	Exogenous Fixed
	Cost of debt:		Endogenous Varied
2.	Industrial Baa bond rate		Endogenous Varied
	Cost of equity: Capital asset pricing model		Endogenous Varied
3.	Risk-free rate: 10-year Treasury note rate		Endogenous Varied
4.	Market risk premium	5.75%	Exogenous Fixed
5.	Equity beta	1.25	Exogenous Fixed
6.	Corporate tax rates ³⁶	38%	Exogenous Fixed
	Nominal WACC		Endogenous Varied

Source: US. Energy Information Administration (EIA). *Levelized Cost and Levelized New Generation Cost*. 2020

Table 2.1.2

KPPIP Priority Electricity Infrastructure Program

Project Name	Type	Funding Scheme	Location	Project Owner	Investment Value (Rp million)	Investment Value (US\$)	Capacity (MW)	Investment Cost (US\$/Kw)
Indramayu	Coal Fired Power Plant	State Budget	Indramayu	PT PLN	29.565.000	2,111,785,714	1.000	2.112
Batang	Coal Fired Power Plant	PPP	Central Java	PT PLN	56.700.000	4.050.000.000	2.000	2.025
Average								2.068

Source: KPPIP 1st Semester of 2019 Report

Based on table 2.1 and cost of capital as a proxy for evaluation basis for the calculation, which has been calculated to this paper to set the boundary and generalized all the cost of capital. Electricity Capacity Planning (ECP) submodule of the National Energy Modelling System (NEMS) set debt to equity ratio 60 to 40, from Annual Energy Outlook 2019 reported by EIA, it suggests a debt fraction 60% is more commonly observed with recent project financing. It should be noted that the analysis is focused on company-level and some subsidiary-level analysis and not at project-level analysis that would give better insight project economics that may vary by location or technology for a given company. Term loan is determined 12 year and after debt service is over, capital structure used by the project is full equity (100% equity). Using that basis of analysis table 2.1.2 mention a comprehensive picture of all projects assumption used in this paper to generate result.

Table 2.1.2

Projects General Assumption

Project Name	Type	Capacity (MW)	Project Cost (US\$)	Capacity Factor	LCOE Capital Cost (Mwh)	Operating year	Debt to Equity Ratio	WACC	Capital Cost Recovery (cUSD/Kwh)
Kaltim-5	Coal Fired	200	413.600.000	85%	51.3	25	60 : 40	7,11%	3.248
Jawa-3	Combine Cycle	800	666.044.306	87%	10.4	20	60 : 40	7,11%	1.308
Merauke-2	Gas Engine	20	16.055.829	30%	29.8	20	60 : 40	7,11%	3.864

Source: Author's Compilation

2.2. NOPAT and EVA Analysis

This second sequence analyze the NOPAT and EVA in the Project by using financial model, NOPAT is calculated as the sales of the electricity minus cost of production deducted by the adjusted tax, then the EVA is calculated as the NOPAT times the capital charges, in electricity project, operating profit is generated from component a tariff-known as capital cost recovery. This paper used capital cost recovery factor to determine the investment cost based on several variables such as WACC, inflation rate, expected return above WACC and project economic life. Figure 2.2 describe about how the operating profit or component a is calculated and also about the assumption which derived the result and component a is a

surplus from the subtraction of cost to the revenue and used to cover interest expense and tax as described in figure 2.2.1.

Variables		
WACC (%)	7.11%	
Expected Return Above WACC (%)	2.00%	
Rp Inflation rate	3.00%	
WACC + Expected Return above WACC	9.11%	

Investment Cost – Component A		
Capital Recovery Factor (CRF)	$R*(1+r)^t$	10.27%
Expected Return Above WACC (%)	$(1+r)^t-1$	
Total Investment Cost (US\$) = (EPC + DevCost + IDC)	31.325.760	
Annual Power Sales (kWh) =	152.424.000	
	CFR x Investment Cost	
Cost of Component A (US\$/kWh) =	Annual Power Sales	0.0211
Component A tariff (cUS\$/kWh)		2.110

Figure 2.2 Component A Calculation as Operating Profit
Source: Author's Compilation

EVA is calculated by subtracting the cost of capital in terms of dollar amount from the operating profit after tax (NOPAT). Figure 2.2.1 explain about the calculation of EVA as a formula to specify the value creation from projects or business performance. EVA is generated from the surplus from ROIC to WACC and NOPAT to capital charge.

$\text{Economic Value Added} = \text{Invested Capital} \times (\text{ROIC} - \text{WACC})$ <p>Or</p> $\text{Economic Value added} = \text{Net Operating Profit After Tax} - \text{Capital Charge}$

Figure 2.2.1 Economic Value Added Equation

Source: Koller, Tim. Marc Goedhart. *Valuation_Measuring and Managing Companies Value*. Wiley, 2015

EVA result is calculated annually discounting to capital structure on the calculating year to have a present value of EVA. Figure 2.2.2 gives the insight of the comparison how a project could give value from positive EVA or vice versa. the result is determined from the capital cost and operating cost that should be covered from net the profitability of the project.

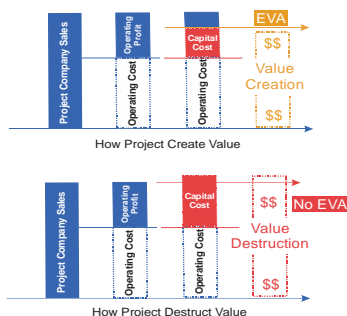


Figure 2.2.3 Comparison of Value Creation Project

Source: Author's Compilation

2.3. ROIC Analysis

ROIC Analysis in this project takes variety of project life calculation in each year about the ratio of NOPAT to Invested Capital. Invested Capital are the capital used in the company or the project to generate return which divide into working capital, property plant and equipment, and other capital related generating operation activities in company. ROIC is expressed in percent of NOPAT to Invested Capital, 1% of ROIC means that the Capital

Invested in the company could produce 1% operating profit to the company. Figure 2.3 describe the principle to help the managers decide which investment will create most value for shareholders in the long term. These principles also help investors assess the potential value of companies they might consider investing in that is caused from ROIC, cash flows, and value and it introduce the way managers can use these relationships to decide among different investment or strategies.

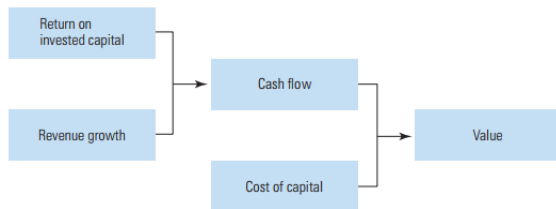


Figure 2.2 ROIC and Growth Relationship

Source: Koller, Tim. Marc Goedhart. *Valuation_Measuring and Managing Companies Value*. Wiley, 2015

2.4. Solvency Ratio Analysis

Solvency ratio measurement is financial ratio that has been used to detect the level of solvability of the company in order to know the impact from variety the capital structure composition. This ratio is a tool for turning data contained in financial statement into information used by investor, manager and executives to better understand what is happening in a company from its capacity to cover the exposures of debt. The increase of leverage used in project finance from the cost of capital optimization side will increase the firm value otherwise the solvency ratio side to give the signal to company for the risk produced from the addition of leverage, this paper use Interest Coverage Ratio to indicates company's ability to pay interest on its outstanding debt and to what extent operating's income can decline before the company is unable to cover its annual expenses and also strengthens the statement as mentioned in figure 2.4 which positive EVA could not increase the risk level of financial distress but if the negative EVA is generated, Solvency Ratio use to emphasize the value destruction due to the higher portion of debt.

$$\text{Interest Coverage} = \text{EBIT} / \text{Interest Expense}$$

Figure 2.4 Interest Coverage Ratio Calculation

Source: Ritz, Michael, Albert Pizzica. *Financial Ratios for Executives*. Wiley, 2015

2.5. Sensitivity Analysis

Additional measure of sensitivity analysis is considered necessary for capturing unpredictable scenario that could be happened in the future for the projects. Sensitivity analysis in this paper use to detect the impact from the change of certain variables, this paper only use DER as the only variable which determined important to affect the result because of its magnitude cause significant impact to WACC calculation. Figure 2.5 describe DER variables which shift from point of evaluation basis of DER (60% 40%).

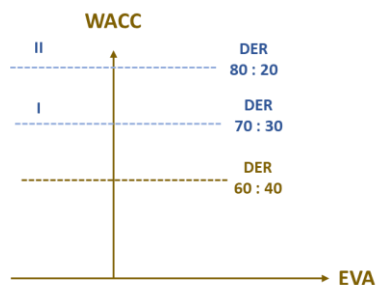


Figure 2.5 Sensitivity Analysis of Debt to Equity

Source: Author's Compilation

3. Result

The result will examine every point that mentioned from method, so the result will give the view about NOPAT and EVA, ROIC, Solvency Ratio and also Sensitivity Analysis to assure about the magnitude of capital structure predispose the EVA result. At the end of the result of this paper, the reader could see about how the Projects produce the EVA and the correlation to level of financial distress generated from the increasing of debt exposure.

3.1. NOPAT and EVA

EVA Calculation										NPV IRR Calculation								
OPERATING YEAR	NOPAT (USD 000)	Total Invested Capital (USD 000,000)	Debt Ratio (%)	Equity Ratio (%)	ROIC (%)	Cost of Equity (%)	WACC (%)	EVA (%)	Discounted EVA (USD 000)	WACC	Net Income (USD 000,000)	FCFF (USD 000,000)	Discounted FCFF (USD 000)	FCFE (USD 000)	Discounted FCFE (USD 000)	FCFE (USD 000,000)	Discounted FCFE (USD 000)	
2022	Year 1	28,014,591.42	394,718,813	60%	40%	7.10%	13.39%	7.11%	0.00%	(46,602.73)	7.11%	1	14,273,364.41	(413,600,000)	39,313,458	20,689,360	18,246,596.84	20,689,360
2023	Year 2	27,852,638.54	378,027,285	56%	44%	7.37%	13.39%	7.53%	-0.2%	(530,591.95)	7.11%	2	14,840,199.48	(165,440,000)	36,539,123	20,365,454	15,840,312.36	20,365,454
2024	Year 3	27,684,639.50	360,684,788	52%	48%	7.68%	13.39%	7.97%	-0.3%	(834,691.99)	7.11%	3	15,429,141.11		33,953,886	20,028,916	13,739,214.66	20,028,916
2025	Year 4	27,509,537.97	342,665,933	47%	53%	8.03%	13.39%	8.42%	-0.4%	(972,747.55)	7.11%	4	16,041,051.47		31,545,045	19,679,253	11,905,506.92	19,679,253
2026	Year 5	27,327,888.01	323,944,343	43%	57%	8.44%	13.39%	8.89%	-0.5%	(964,127.80)	7.11%	5	16,676,826.34		29,300,748	19,315,953	10,306,002.52	19,315,953
2027	Year 6	27,139,153.70	304,492,610	38%	62%	8.91%	13.39%	9.38%	-0.5%	(832,780.52)	7.11%	6	17,337,396.42		27,209,934	18,938,485	8,911,568.40	18,938,485
2028	Year 7	26,943,058.76	284,282,261	33%	67%	9.48%	13.39%	9.89%	-0.4%	(605,984.43)	7.11%	7	18,023,728.73		25,262,279	18,546,295	7,696,635.08	18,546,295
2029	Year 8	26,739,316.10	263,283,707	28%	72%	10.16%	13.39%	10.42%	0%	(312,870.50)	7.11%	8	18,736,828.01		23,448,149	18,138,809	6,638,765.63	18,138,809
2030	Year 9	26,527,627.49	241,466,210	23%	77%	10.99%	13.39%	10.97%	0%	17,190.45	7.11%	9	19,477,738.16		21,758,554	17,715,432	5,718,276.24	17,715,432
2031	Year 10	26,307,683.02	218,797,831	18%	82%	12.02%	13.39%	11.54%	0%	356,217.16	7.11%	10	20,247,543.80		20,185,103	17,275,543	4,917,902.48	17,275,543
2032	Year 11	26,079,160.72	195,245,385	12%	88%	13.36%	13.39%	12.13%	1%	679,138.03	7.11%	11	21,047,371.86		19,850,642	16,818,499	4,222,505.69	16,818,499
2033	Year 12	25,841,726.04	170,774,393	6%	94%	15.13%	13.39%	12.75%	2%	965,078.38	7.11%	12	21,878,393.22		19,573,635	17,355,843	3,618,814.67	16,343,629
2034	Year 13	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	511,865.20	7.11%	13	22,741,824.41		18,085,909	15,018,121	42,139,031	8,228,813.31
2035	Year 14	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	450,766.38	7.11%	14	22,741,824.41		39,285,824	15,018,121	42,139,031	7,257,249.09
2036	Year 15	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	397,462.52	7.11%	15	22,741,824.41		39,285,824	14,021,213	42,139,031	6,400,396.07
2037	Year 16	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	350,561.14	7.11%	16	22,741,824.41		39,285,824	13,090,480	42,139,031	5,644,710.46
2038	Year 17	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	309,170.89	7.11%	17	22,741,824.41		39,285,824	12,221,529	42,139,031	4,978,247.56
2039	Year 18	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	272,657.53	7.11%	18	22,741,824.41		39,285,824	11,410,260	42,139,031	4,390,472.99
2040	Year 19	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	240,474.06	7.11%	19	22,741,824.41		39,285,824	10,652,842	42,139,031	3,872,096.12
2041	Year 20	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	212,081.63	7.11%	20	22,741,824.41		39,285,824	9,945,703	42,139,031	3,414,923.27
2042	Year 21	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	187,041.46	7.11%	21	22,741,824.41		39,285,824	9,285,504	42,139,031	3,011,728.16
2043	Year 22	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	164,957.74	7.11%	22	22,741,824.41		39,285,824	8,669,129	42,139,031	2,656,137.72
2044	Year 23	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	145,481.42	7.11%	23	22,741,824.41		39,285,824	8,093,669	42,139,031	2,342,531.34
2045	Year 24	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	128,304.63	7.11%	24	22,741,824.41		39,285,824	7,556,408	42,139,031	2,065,952.02
2046	Year 25	25,595,031.42	171,637,824	0%	100%	14.91%	13.39%	13.39%	2%	113,155.89	7.11%	25	22,741,824.41		39,285,824	7,054,811	42,139,031	1,822,028.01
Average		26,268,086.39	228,387,011	17%	83%	17%	13.39%	11.64%	1%	400,367.47			20,386,132.02	1,001,776,380.29	467,697,667.89	771,663,036.93	6,713,895.50	771,663,036.93
NPV Project		54,097,667.89																
NPV Equity		2,407,387.62																
EVA		400,367.47																
IRR Project		8.56%																
IRR Equity		13.57%																

Figure 3.1 NOPAT and EVA Result of Kaltim 5 Project

Source: Author's Compilation

Figure 3.1 explain about the calculation of NOPAT of Kaltim 5 Project which generated from operating profit after tax, Debt to Equity ratio are on average 17 : 83 along the project life due to the magnitude of the diminishing of the debt portion in capital structure although the beginning of the period the DER is 60 : 40 because EVA calculated the real outstanding of composition for debt to equity at the time of valuation and a slight different to calculation of NPV on Project in order to application of beginning DER for lifetime of cash flow to project. Kaltim 5 project generate positive EVA equals to US\$ 0.4 million parallel with positive NPV equals to US\$ 54.08 million.

EVA Calculation											NPV IRR Calculation							
OPERATING YEAR		NOPAT (USD 000)	Total Invested Capital (USD 000,000)	Total Invested Capital (USD 000,000)	Debt Ratio (%)	Equity Ratio (%)	ROIC (%)	Cost of Equity (%)	WACC (%)	EVA (%)	Discounted EVA (USD 000)	WACC	Net Income (USD 000,000)	FCFF (USD 000,000)	Discounted FCFF (USD 000)	FCFE (USD 000)	Discounted FCFE (USD 000)	
2022	Year 1	47,096,044.66	612,653,590	644,164,198	60%	40%	7.31%	13.39%	7.11%	0.2%	1,209,943.21	7.11%	1	31,510,608	(666,044,306)	68,843,074	35,299,795	31,131,999
2023	Year 2	46,835,242.45	584,861,438	617,154,452	56%	44%	7.59%	13.39%	7.53%	0.1%	313,403.00	7.11%	2	32,293,014	73,477,015	64,045,919	34,778,191	27,050,583
2024	Year 3	46,564,268.96	555,985,391	589,091,326	52%	48%	7.90%	13.39%	7.97%	-0.1%	(291,755.57)	7.11%	3	33,105,935	73,206,041	59,574,014	34,236,244	23,485,000
2025	Year 4	46,282,727.51	525,983,178	559,933,738	47%	53%	8.27%	13.39%	8.42%	-0.2%	(626,474.73)	7.11%	4	33,950,559	72,924,500	55,405,564	33,673,161	20,371,508
2026	Year 5	45,990,205.94	494,810,880	529,639,004	43%	57%	8.68%	13.39%	8.89%	-0.2%	(720,695.43)	7.11%	5	34,828,124	72,631,978	51,520,228	33,088,118	17,654,124
2027	Year 6	45,686,276.02	462,422,861	498,162,775	38%	62%	9.17%	13.39%	9.38%	-0.2%	(611,870.83)	7.11%	6	35,739,914	72,328,048	47,899,020	32,480,258	15,283,696
2028	Year 7	45,370,492.84	428,771,710	465,458,973	33%	67%	9.75%	13.39%	9.89%	-0.1%	(342,988.43)	7.11%	7	36,687,263	72,012,265	44,524,222	31,848,692	13,217,075
2029	Year 8	45,042,394.12	393,808,164	431,479,723	28%	72%	10.44%	13.39%	10.42%	0%	39,786.90	7.11%	8	37,671,559	71,684,166	41,379,295	31,192,494	11,416,387
2030	Year 9	44,701,499.55	357,481,040	396,175,283	23%	77%	11.28%	13.39%	10.97%	0%	489,693.77	7.11%	9	38,694,243	71,343,272	38,448,805	30,510,705	9,848,399
2031	Year 10	44,347,310.08	319,737,157	359,493,969	18%	82%	12.34%	13.39%	11.54%	1%	961,992.00	7.11%	10	39,756,812	70,989,082	35,718,348	29,802,326	8,483,955
2032	Year 11	43,979,307.23	280,521,264	321,382,084	12%	88%	13.68%	13.39%	12.13%	2%	1,416,414.05	7.11%	11	40,860,820	70,621,079	33,174,481	29,066,321	7,297,483
2033	Year 12	43,596,952.27	239,775,950	281,783,835	6%	94%	15.47%	13.39%	12.75%	3%	1,819,250.83	7.11%	12	42,007,885	70,238,725	30,804,658	28,301,611	6,266,557
2034	Year 13	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	1,038,159.20	7.11%	13	43,199,685	69,841,458	28,597,169	27,050,583	5,136,480
2035	Year 14	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	915,585.23	7.11%	14	43,199,685	69,841,458	26,698,879	25,426,598	4,136,458
2036	Year 15	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	807,483.39	7.11%	15	43,199,685	69,841,458	24,926,598	23,727,161	3,186,458
2037	Year 16	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	712,144.98	7.11%	16	43,199,685	69,841,458	23,271,961	22,084,904	2,236,458
2038	Year 17	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	628,063.04	7.11%	17	43,199,685	69,841,458	21,727,160	20,841,458	1,250,974
2039	Year 18	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	553,908.53	7.11%	18	43,199,685	69,841,458	20,284,904	19,284,904	726,794
2040	Year 19	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	488,509.35	7.11%	19	43,199,685	69,841,458	18,938,384	18,941,458	6,619,384
2041	Year 20	43,199,685.46	239,775,950	282,975,636	0%	100%	15.27%	13.39%	13.39%	2%	430,831.75	7.11%	20	43,199,685	69,841,458	17,681,248	17,681,458	5,567,912
Average		44,554,510.27	358,751,011	397,886,222	21%	79%	21%	13.39%	11.20%	1%	9,231,384.22			39,135,211.05	1,423,925,650.48	753,463,392.07	943,009,578.40	13,237,119.27
NPV Project		87,519,625.66																
NPV Equity		(1,675,337.09)																
EVA		9,231,384.22																
IRR Project		8.78%																
IRR Equity		13.30%																

Figure 3.1.1 explain about that Jawa-3 Project generate positive EVA equals to US\$ 9.32 million along with the positive NPV Project and IRR Project because it is higher than WACC, but NPV on Equity generate negative value because of the IRR on Equity lower than IRR on Equity. It is a slight contradicting to positive value of EVA.

EVA Calculation											NPV IRR Calculation										
OPERATING YEAR	NOPAT (USD 000)	Total Invested Capital (USD 000,000)	Total Invested Capital (USD 000,000)	Debt Ratio (%)	Equity Ratio (%)	ROIC (%)	Cost of Equity (%)	WACC (%)	EVA (%)	Discounted EVA (USD 000)	WACC	Net Income (USD 000,000)	FCFF (USD 000,000)	Discounted FCFF (USD 000)	FCFE (USD 000)	Discounted FCFE (USD 000)	FCFE (USD 000,000)	Discounted FCFE (USD 000)			
													(16,055,829)		(6,422,332)		-				
2022	Year 1	1,135,308.90	14,768,779	15,528,381	60%	40%	7.31%	13.39%	7.11%	0.2%	29,167.19	7.11%	1	759,603	1,777,542	1,659,548	850,946	750,476	20,689,360	18,246,596.84	
2023	Year 2	1,129,021.94	14,098,814	14,877,278	56%	44%	7.59%	13.39%	7.53%	0.1%	7,554.97	7.11%	2	778,463	1,771,255	1,543,907	838,372	652,088	20,365,454	15,840,312.36	
2024	Year 3	1,122,489.78	13,402,721	14,200,781	52%	48%	7.90%	13.39%	7.97%	-0.1%	(7,033.13)	7.11%	3	798,060	1,764,723	1,436,106	825,307	566,135	20,028,916	13,739,214.66	
2025	Year 4	1,115,702.88	12,679,481	13,497,901	47%	53%	8.27%	13.39%	8.42%	-0.2%	(15,101.95)	7.11%	4	818,421	1,757,936	1,335,620	811,734	491,081	19,679,253	11,905,506.92	
2026	Year 5	1,108,651.28	11,928,033	12,767,609	43%	57%	8.68%	13.39%	8.89%	-0.2%	(17,373.26)	7.11%	5	839,575	1,750,884	1,241,959	797,630	425,575	19,315,953	10,306,002.52	
2027	Year 6	1,101,324.67	11,147,280	12,008,835	38%	62%	9.17%	13.39%	9.38%	-0.2%	(14,749.91)	7.11%	6	861,555	1,743,558	1,154,666	782,977	368,433	18,938,485	8,911,568.40	
2028	Year 7	1,093,712.32	10,336,077	11,220,469	33%	67%	9.75%	13.39%	9.89%	-0.1%	(8,268.16)	7.11%	7	884,392	1,735,945	1,073,312	767,752	318,614	18,546,295	7,696,635.08	
2029	Year 8	1,085,803.09	9,493,237	10,401,357	28%	72%	10.44%	13.39%	10.42%	0%	955.11	7.11%	8	908,120	1,728,036	997,500	751,934	275,206	18,138,009	6,638,765.63	
2030	Year 9	1,077,585.40	8,617,526	9,550,299	23%	77%	11.28%	13.39%	10.97%	0%	11,804.68	7.11%	9	932,773	1,719,819	928,856	735,499	237,408	17,715,432	5,718,276.24	
2031	Year 10	1,069,047.23	7,707,663	8,666,051	18%	82%	12.34%	13.39%	11.54%	1%	23,190.02	7.11%	10	958,388	1,711,280	861,035	718,422	204,516	17,275,543	4,917,902.48	
2032	Year 11	1,060,176.06	6,762,315	7,747,316	12%	88%	13.68%	13.39%	12.13%	2%	34,144.43	7.11%	11	985,001	1,702,408	799,712	700,680	175,915	16,818,499	4,222,505.69	
2033	Year 12	1,050,958.91	5,780,098	6,792,751	6%	94%	15.47%	13.39%	12.75%	3%	43,855.31	7.11%	12	1,012,652	1,693,192	742,585	682,246	151,063	16,343,629	3,618,814.67	
2034	Year 13	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	25,026.12	7.11%	13	1,041,382	1,683,615	689,370	1,683,615	328,773	42,139,031	8,228,813.31	
2035	Year 14	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	22,071.32	7.11%	14	1,041,382	1,683,615	643,610	1,683,615	289,955	42,139,031	7,257,249.09	
2036	Year 15	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	19,465.39	7.11%	15	1,041,382	1,683,615	600,887	1,683,615	255,720	42,139,031	6,400,396.07	
2037	Year 16	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	17,167.14	7.11%	16	1,041,382	1,683,615	561,000	1,683,615	225,528	42,139,031	5,644,710.46	
2038	Year 17	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	15,140.24	7.11%	17	1,041,382	1,683,615	523,760	1,683,615	198,900	42,139,031	4,978,247.56	
2039	Year 18	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	13,352.66	7.11%	18	1,041,382	1,683,615	488,993	1,683,615	175,416	42,139,031	4,390,472.99	
2040	Year 19	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	11,776.13	7.11%	19	1,041,382	1,683,615	456,533	1,683,615	154,705	42,139,031	3,872,096.12	
2041	Year 20	1,041,382.30	5,780,098	6,821,481	0%	100%	15.27%	13.39%	13.39%	2%	10,385.74	7.11%	20	1,041,382	1,683,615	425,229	1,683,615	136,439	42,139,031	3,414,923.27	
Average		1,074,042.04	8,648,141	9,591,544	21%	79%	21%	13.39%	11.20%	1%	222,534.03			943,403.08	34,325,503.91	18,163,187.90	22,732,422.13	319,097.27	560,967,879.84	155,940,010.36	
NPV Project		2,107,359.12																			
NPV Equity		(40,386.09)																			
EVA		222,534.03																			
IRR Project		8.78%																			
IRR Equity		13.30%																			

Figure 3.1.2 NOPAT and EVA Result of Manokwari 2

Source: Author's Compilation

Figure 3.1.2 explain about that Manokwari 2 generate positive EVA equals to US\$ 0.22 million along with positive NPV and IRR Project because it is higher than WACC along the negative NPV and IRR lower than WACC, but this project has the same issue with Jawa-3 project that has a negative cash flow to equity.

NPV to Project or Equity has a different calculation to EVA calculation, NPV to Project and Equity are the today valuation, a serial cash flow happened in the future discounted with today discount rate using WACC and Cost of equity and after that it compared to initial outlay but EVA valuation does not compare to initial outlay, it only describes the condition at certain time to check the value added that be given to capital investor.

3.2. ROIC Analysis

Earlier result in NOPAT and EVA Analysis directly stated that if ROIC is higher than WACC so that the company or project will create a positive EVA regardless the capital structure and the portion of debt and equity. Figure 3.2 will explain the growth of ROIC compared with the growth of EVA of 3 (three) Projects. As we could see in that table that Kaltim-5, Jawa-3 and Manokwari-2 on average generate ROIC higher than WACC that means all of those projects get positive EVA as a surplus for the company for creating a bigger profit to cover cost for capital holder. Still, other than that, analyst or investor should get comprehensively point of sight to the EVA calculation. Because there are variables that drive the result of ROIC and also WACC. ROIC could become another additional parameter for investor or project analyst to get another perspective for project's financial aspect to create value to shareholders juxtapose with NPV IRR calculation.

Operating Year		Kaltim 5		Jawa 3		Manokwari 2	
		ROIC	WACC	ROIC	WACC	ROIC	WACC
2022	Year 1	7.10%	7.11%	7.31%	7.11%	7.31%	7.11%
2023	Year 2	7.37%	7.53%	7.59%	7.53%	7.59%	7.53%
2024	Year 3	7.68%	7.97%	7.90%	7.97%	7.90%	7.97%
2025	Year 4	8.03%	8.42%	8.27%	8.42%	8.27%	8.42%
2026	Year 5	8.44%	8.89%	8.68%	8.89%	8.68%	8.89%

Operating Year		Kaltim 5		Jawa 3		Manokwari 2	
		ROIC	WACC	ROIC	WACC	ROIC	WACC
2027	Year 6	8.91%	9.38%	9.17%	9.38%	9.17%	9.38%
2028	Year 7	9.48%	9.89%	9.75%	9.89%	9.75%	9.89%
2029	Year 8	10.16%	10.42%	10.44%	10.42%	10.44%	10.42%
2030	Year 9	10.99%	10.97%	11.28%	10.97%	11.28%	10.97%
2031	Year 10	12.02%	11.54%	12.34%	11.54%	12.34%	11.54%
2032	Year 11	13.36%	12.13%	13.68%	12.13%	13.68%	12.13%
2033	Year 12	15.13%	12.75%	15.47%	12.75%	15.47%	12.75%
2034	Year 13	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2035	Year 14	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2036	Year 15	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2037	Year 16	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2038	Year 17	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2039	Year 18	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2040	Year 19	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2041	Year 20	14.91%	13.39%	15.27%	13.39%	15.27%	13.39%
2042	Year 21	14.91%	13.39%				
2043	Year 22	14.91%	13.39%				
2044	Year 23	14.91%	13.39%				
2045	Year 24	14.91%	13.39%				
2046	Year 25	14.91%	13.39%				
		12.50%	11.64%	12.20%	11.20%	12.20%	11.20%

Figure 3.2 ROIC and WACC of Projects

Source: Author's Compilation

3.3. Solvency Ratio

The increasing of debt portion in order to minimize the wacc will impact of the level of financial distress when a project or company or business could not make the payment of the interest when the worst condition to come. So, the Interest Coverage Ratio (ICR) for solvency ratio analysis to clearly see the impact of the capital structure that could cause the increasing level of financial distress for all Projects. Figure 3.3 explain the result of the Interest Coverage Ratio and EBIT to Debt Repayment as additional Indicator to strengthen the ICR Ratio. For 3 (three) Projects. On Average, Kaltim-5 and Jawa-3 generate Interest Coverage Ratio 9.47x and 10.28x, it means that operating profit could back up 9 and 10 times more than the interest expense, Manokwari-2 generate ICR 9.91x that means operating profit could back up 9 times more than interest expense. Those results describe the reveal the good value from three projects and good financial strength to cover all interest in those projects.

Operating Year		Interest Coverage Ratio		
		Kaltim 5	Jawa 3	Manokwari 2
2022	Year 1	3.53	3.70	3.70
2023	Year 2	3.78	3.96	3.96
2024	Year 3	4.08	4.28	4.28
2025	Year 4	4.46	4.67	4.67
2026	Year 5	4.92	5.16	5.16
2027	Year 6	5.53	5.79	5.79
2028	Year 7	6.33	6.63	6.63
2029	Year 8	7.46	7.81	7.81
2030	Year 9	9.15	9.59	9.59
2031	Year 10	11.97	12.55	12.55
2032	Year 11	17.62	18.47	18.47
2033	Year 12	34.58	36.25	36.25
Average		9.45	9.91	9.91

Figure 3.3 Interest Coverage Ratio of Projects

Source: Author's Compilation

3.4. Sensitivity Analysis

Sensitivity analysis is known as risk mitigating tools or scenario analysis as an additional measurement to the project by mapping the different condition in order the changes of certain variables that cause impact to the project. This paper takes the boundary of sight to the debt to equity ratio which can cause the profitability of the project, as it mentioned from the previous chapter in general assumption which all projects use 60 : 40 Debt to Equity Ratio in order to ease and equalize the basis of evaluation. Hereafter, in this sensitivity analysis, there are 3 (three) condition of DER that will be shift from the default condition, first, 70 : 30, second 80 : 20 and last 40 : 60. Last condition of sensitivity, it will take a higher portion of equity than debt in order to get the more comprehensive result. Figure 3.4 will explain about the sensitivity that cause to the EVA of the projects which caused from the alteration of WACC and also to the cash flow to the equity of the projects.

	DER 60 40		DER 70 30		DER 80 20		DER 40 60	
Kaltim 5	NPV Project	84,966,817.11	NPV Project	100,573,811.64	NPV Project	117,899,439.90	NPV Project	58,127,184.57
	NPV Equity	2,407,387.62	NPV Equity	1,158,652.76	NPV Equity	428,699.48	NPV Equity	6,229,596.21
	EVA	2,281,398.76	EVA	13,797,221.47	EVA	29,462,102.32	EVA	(36,005,626)
	IRR Project	9.35%	IRR Project	8.78%	IRR Project	7.77%	IRR Project	10.93%
	IRR Equity	13.57%	IRR Equity	13.30%	IRR Equity	13.44%	IRR Equity	13.74%
	ICR Average	9.91x	ICR Average	7.2x	ICR Average	5.53x	ICR Average	17.44x
Debt		60.00%		70.00%		80.00%		40.00%
Jawa 3	NPV Project	87,419,625.66	NPV Project	106,551,064.83	NPV Project	127,456,139.63	NPV Project	53,769,316.60
	NPV Equity	(1,675,337.09)	NPV Equity	(26,374.28)	NPV Equity	2,380,230.51	NPV Equity	(2,944,901.49)
	EVA	9,231,384.22	EVA	36,745,884.39	EVA	63,598,707.67	EVA	(47,679,254.66)
	IRR Project	8.78%	IRR Project	8.01%	IRR Project	7.23%	IRR Project	10.34%
	IRR Equity	13.30%	IRR Equity	13.39%	IRR Equity	13.59%	IRR Equity	13.27%
	ICR Average	9.91x	ICR Average	7.65x	ICR Average	5.99x	ICR Average	17.88x
Debt		60.00%		70.00%		80.00%		40.00%
Manokwari 2	NPV Project	2,107,359.12	NPV Project	3,737,741.13	NPV Project	5,589,448.47	NPV Project	(611,928.89)
	NPV Equity	(40,386.09)	NPV Equity	702,709.06	NPV Equity	1,445,804.21	NPV Equity	(1,526,576.39)
	EVA	222,534.03	EVA	1,631,720.11	EVA	3,050,479.68	EVA	(2,562,425.45)
	IRR Project	8.78%	IRR Project	8.85%	IRR Project	8.92%	IRR Project	8.65%
	IRR Equity	13.30%	IRR Equity	15.33%	IRR Equity	18.75%	IRR Equity	10.87%
	ICR Average	9.91x	ICR Average	8.49x	ICR Average	7.42x	ICR Average	14.86x
Debt		60.00%		70.00%		80.00%		40.00%

Figure 3.4 Sensitivity Analysis

Source: Author's Compilation

Figure 3.4 describe about the result of sensitivity analysis that is caused by the change of capital structure and the effect to EVA result also the result of NPV IRR and Interest Coverage Ratio. From that explanation, it could be derived that the increasing of debt portion contemplating with equity reduction cause the increasing of EVA for all the project, NPV IRR for project Jawa-3 and Manokwari-2 have the same effect toward EVA caused by the increasing of Debt portion but have a slightly different for kaltim-5. It arouses curiosity to scrutinize the effect of NPV or IRR on Equity to EVA.

4. Conclusion

Enormous amount of capital needed in Project in Indonesia could not only fulfilled by the corporate finance but also need specific financing scheme to finance the project, which does not rely on the balance sheet of the company but only in the cash flow produce from the project. Project finance put the greater level of risk for lenders compared with the equity holder due to non-recourse and source of payment. Some Electricity Projects in Indonesia have high Debt to Equity Ratio so that create a curiosity for equity holder in order to get a financial benefit from the project. Economic Value Added become a one of financial indicator to strengthen another commonly used NPV and IRR parameter to reassure the equity holder to still get the benefit or “bonus” from the excess between ROIC and WACC of the project. Project owner could project the value they could get from EVA analysis in the Project in order to protect the capital impairment as a safety margin and to maintain the cost of debt which sufficient to create positive EVA.

PLN as a representative of GOI could become a project owner and project executor. Once become an owner PLN should pay attention to the positive EVA and when become an executor PLN should pay attention to give the lowest tariff to the owner of the project regardless of the value of the EVA. Capital structure does not affect the value of EVA as long as the ROIC of the project has higher value than WACC.

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