CHAPTER IV
Research Result and Discussion

4.1 Compound Annually Growth rates (CAGR)

To calculating Compound annually growth rates (CAGR) author generates it from PT. Adaro Energy Tbk, Revenue from 2010-2013.

TABLE 4.1 Revenues of PT. Adaro Energy Tbk, (expressed in Billion USD)

Year	2010	2011	2012	2013
Revenues	2,718	3,987	3,722	3,285

Source: www.adaro.com/investing/financial-highlights-and-graph-tool/

The formula to calculate Compound annually growth rates (CAGR)

$$CAGR = \left(\frac{(Ending\ Value)}{(Beginning\ Value)}\right)^{\left(\frac{1}{\#of\ Years}\right)} - 1$$

Therefore the Compound annually growth rates (CAGR) of PT Adaro Energy is

$$CAGR = \left(\frac{3285}{2718}\right)^{\left(\frac{1}{4}\right)} - 1 = 0.0485$$

So there are three scenario that used in this research. which are Pessimistic. Most Likely and Optimistic. The CAGR for most likely scenario is 4.8%. For the pessimistic scenario author assuming the CAGR is 3.23% or about -35% from the most likely scenario. This condition may happened because the Adaro revise their production for next year down to 3.4% (www.adaro.com/investing/financial-reports:2015) , Government also want to increase the royalty for coal about 16% (www.pemeriksaanpajak.com/2016/01/2015), Coal Price also decrease about 3% from last year(www.tambang.co.id), beside that the investment for coal industry decrease 75% from 2009 reported by Vicharius DJ at Majalah Tambang Vol. 10 (2016:66). For the optimistic scenario the amount is 6.6% or about 37% from the most likely scenario. The author assumes that PT Adaro Energy Tbk can increase their market share because they have a lot of project from the PT Adaro Energy Tbk itself , its subsidiaries that have numerous competitive advantage and also Adaro and non-coal mining also contribute 37% of EBITDA in 2014 (www.adaro.com/investing/financial-reports/).

4.2 Capital Expenditure

In order to calculate the forecasted FCF of Adaro Energy Tbk, the first thing to do is by obtaining the percentage share of historical CAPEX. CAPEX obtained from the liquidity and capital resources as a part of financial statement. Moreover, the percentage of CAPEX obtained by firstly summing all of the revenues in the last three years (2010 to 2013). Further, the same thing also needs to be done on CAPEX with the same periods as total revenue calculated. Thus, the percentage share of total CAPEX against the total revenue obtained by dividing the total revenues with total CAPEX and is multiplied with 100%. Based on the calculations that have been carried out, then the percentage share of historical CAPEX against the total revenues is 12%. The detail numbers of revenues and CAPEX in each historical year can be seen as follows.

Table 4.2 Historical CAPEX and Revenue

Year	Revenue	CAPEX
2010	2,718	283
2011	3,987	651
2012	3,722	541
2013	3,285	185
Total	13,712	1,660
Percentage	12%	

Source: Research findings

The percentage obtained is used for calculating CAPEX in the year projections by multiplying the percentage with the net revenue in each projected year, and then with so the CAPEX in each year projection can be obtained. Therefore, the net revenue in each year projection firstly needs to be calculated by using the concept of TVOM with growth scenario as its rate. There are three different scenarios in this research, which are pessimistic with average growth as 4.8%, moderate with stable average growth as 3.23%, and pessimistic with average growth as 6.6%. Thus, the results obtained in pessimistic scenario are as follows (in **USD** million) (see **Table 4.2**).

Table 4.3 Revenue and CAPEX in 3.23% Growth

Year	Revenue	Capex
2015	3391	110
2016	3501	113
2017	3614	117
2018	3730	120
2019	3851	124
2020	3975	128

Source: Research findings

Table 4.3 shows the results of the CAPEX in each year projection that has been obtained by multiplying 12% (as the percentage share of historical CAPEX against the total historical revenues) with the net revenue in each year projection. Moreover, the results obtained in moderate scenario are as follows (in **USD** million) (see **Table 4.4**).

Table 4.4 Revenue and CAPEX in 4.8% Growth

Year	Revenue	Capex
2015	3285	182
2016	3444	167
2017	3611	175
2018	3787	184
2019	3970	193
2020	4163	202

Source: Research findings

Contrary to the results in the **Table 4.3**, on the **Table 4.4** shows both revenue and CAPEX changes are not too significant in every year and just slightly up. These occur due to the stable average growth that is used in this scenario. Further, the results obtained in optimistic scenario can be seen in the following table (in **USD** million) (see **Table 4.5**).

Table 4.5 Revenue and CAPEX in 6.6% Growth

Year	Revenue	Capex
2015	3285	182
2016	3502	231
2017	3733	246
2018	3979	263
2019	4242	280
2020	4522	298

Source: Research findings

Similar to that shown in the **Table 4.4**, on the **Table 4.5** also occurs a significant increase both in the revenue and CAPEX for every year since the average growth rate used is quite large when compared with the two previous scenarios. By looking at all of the above results, it can be said that CAPEX is directly proportional to revenue, because the small and large changes in revenue will result in small and large changes in CAPEX as well. Therefore, CAPEX will be strongly affected by the growth in revenue.

4.3 Working Capital

The second step after CAPEX that needs to be done in order to get into the final FCF calculation is by calculating the percentage of change in net working capital. This percentage can be firstly obtained by subtracting current asset with

current liability in every historical year. Secondly, the subtraction result in every year needs to be subtracted with the result of the first calculation in the previous year in order to get the change (Δ) of net working capital, e.g.: the subtraction result in 2015 has to be subtracted with the subtraction result in 2014 and so on for the remaining years. In detail, the calculation results can be seen in the following table (in **USD** million) (see **Table 4.6**).

Table 4.6 ΔNWC in Historical Years

Year	Revenue	WC	(Year-Year)	ΔNWC
2010	2,718	587.5		
2011	3,987	-683.5	2011-2010	-1271
2012	3,722	-1384	2012-2012	-745.5
2013	3,285	514.5	2013-2014	1,898.5
Total	13,712			-118

Source: Research findings

From results shown in **Table 4.6**, thus the percentage share of ΔNWC against revenue can be obtained by dividing the total ΔNWC with total revenues and then multiplied by 100%; thereby the result of these calculations is -0.85%. The result of the percentage share of ΔNWC against revenue is used to obtain the NWC in the year projections from period 2015 to 2020. Even though the percentage share of NWC against revenue is obtained through historical years, yet the NWC in every projected year is not obtained by the same calculation as CAPEX in the year projections. Furthermore, the concept of NWC calculation for year projections is by using TVOM concept that uses -8.5% as the interest (i). In this calculation, and the NWC used in each multiplication is derived from a year before that the new NWC is being calculated, e.g.: in order to obtain NWC for 2015 then it must refer to the NWC in 2014 and so on for the remaining years. Therefore, since the NWCs in the year projections are not obtained based on their percentage share against revenue, thus the NWC in every scenario will be the same since the sameness of the historical years as the source for every scenario. The results of NWC in year projections are as follows (in **USD** million) (see **Table 4.7**).

Table 4.7 NWC in year projection

Year	NWC
2015	-492.7755
2016	-450.8896
2017	-412.564
2018	-377.496
2019	-345.4089
2020	-316.0491

Source: Research findings

4.4 Weighted Average Cost of Capital

The process of WACC calculations may refer to

$$WACC = \frac{E}{D+E} \times C_e + \frac{D}{D+E} \times C_d \times (1-T)$$

where the total debt and total equity in the year 2013 need to be discovered in order to obtain the weight of each. For details, are as follows (in **USD** million) (see **Table 4.8**).

Table 4.8 Weight of Debt and Equity

		% of weight
Debt	**1,151**	**67%**
Equity	**557.2**	**33%**
Total	**1,708.2**	

Source: Research findings

After obtaining each percentage of weight, the next determination is on the cost of debt and equity. The cost of equity can be obtained by using CAPM The detailed results can be seen in the following formula

$$\text{CE} = k_{rf} + \beta_j(k_m - k_{rf})$$

Where:

CE : The required rate of return for the *j*th year

k_{rf} : The risk-free return. In this study, the risk free is Central Bank Rate

k_m : The rate of return on the stock market (usually was measured with IHSG).

k_m can be measured by the formula:

$$\text{k}_\text{m} = [(1 + \text{K}_\text{rf})(1 + \text{Inflation Rate}) - 1]$$

β : Is a measure of the systematic risk of the common stock's returns. Systematic risks reflects how the returns earned by a risky investment co-vary with the returns earned by the market portfolio of all risky investments

$$\beta = \frac{N\sum XY - (\sum X)(\sum Y)}{N\sum X^2 - (\sum X)^2}$$

Where:

β : Stock beta

X : Stock return

Y : Market Return

N : Total observations

From the calculation above, it can be conclude that the cost of equity of PT. Adaro Energy is 8%. The cost of debt can be obtain by using some numbers of total debt, interest rate, and corporate tax. The total debt that needs to be taken is from year 2014 only as the last historical year since it has represented total debt from previous years. Further, the interest rate and corporate tax of the Indonesia are 7.5% . Therefore, the cost of debt can be obtain by using

$$Cd = \frac{(Rd\ x(1-t))x total\ debt}{\text{total debt}}$$

Where:

Cd : Cost of Debt

Rd : Interest Rate

t : Corporate Tax

Table 4.9 Cost of Debt

Interest Rate	**7.5%**
Corporate Tax	**25**
Total Debt	**1151**
Cost of Debt	**5.63%**

Source: Source: Research findings , www.bi.go.id/en/moneter/bi-rate/data , and pajak.go.id

Through the explanations above, it can be said that all the variables needed to complete the calculation of WACC has been obtained, thus calculation of the **Equation 2.2** is now able to be solved. By considering the use of corporate tax in the Indonesia by 25%, then the final result of the WACC is 6.3%.

4.5 Free Cash Flow

The free cash flow of PT. Adaro Energy Tbk, in every year projection can be obtained by using

$$FCF = EBIT\ 1 - t + Depreciation - Capex - Working\ Capital$$

Requires EBIAT, depreciation, CAPEX and NWC. Firstly, in order to obtain the EBIAT then the EBIT has to be calculated in advance by subtracting the revenue with COGS plus expenses. However, the revenue, COGS, and expenses in year projections need to be found. The revenue can be found by using TVOM concept with the growth rate used is based on the scenario of annual average growth rate. Meanwhile, the COGS and expenses can be obtained by looking at the average percentage share of each against revenue, thus those percentages are used as the percentage share against revenue in every year projection. Furthermore, the EBIAT itself can be obtained by subtracting EBIT with one minus 25% as the corporate tax in the Indonesia. Secondly, the depreciation also needs to be found and can be obtained in the same way with COGS and expenses as described in the previous paragraph. Thirdly, CAPEX and NWC have been discovered and described in the beginning of this chapter. By referring this equation

$$FCF = E(1 - t) + Depreciation - Capex - Working\ Capital$$

results of FCF in the pessimistic, Moderate and optimistic scenario are as follows (in **USD** million) (see **Table 4.10**).

Table 4.10 FCF in the Pessimistic , Moderate and Optimistic Scenario

	FCF		
Year	**Pessimistic**	**Moderate**	**Optimistic**
2015	778	783	788
2016	749	760	772
2017	725	741	760
2018	704	726	752
2019	685	715	749
2020	670	707	751

Source: Research findings

Table 4.10 shows the FCF from 2016 to 2025 with 4.8 % as the annual average growth rate on revenue. It can be seen that the FCF from year to year tend to decline. Meanwhile, since there is no incline nor decline for the annual average growth rate, thus the FCF in the moderate scenario is likely to be stable and can be seen.On the other hand, the FCF in the optimistic scenario is much better when

compared with the previous two due to the annual average growth rate used is 6.6%. The detailed results of FCF in the optimistic scenario.

As shown in **Table 4.10**, the FCF at the final period of year projections has gained a substantial increase when compared to the first year of the year projections. The FCF results that have been obtain in every year of every scenario are the future value, which means those have to be discount by using

$$DFCF = \frac{FCF}{(1 + \text{WACC})^t}$$

in order to obtain the present value. The results of the discounted FCF in the pessimistic scenario are as follows (in **USD** million) (see **Table 4.11**).

Table 4.11 Present FCF Value in the Pessimistic Scenario

	Present FCF Value		
Year	**Pessimistic**	**Moderate**	**Optimistic**
2015	545	549	553
2016	525	533	541
2017	508	520	532
2018	493	509	527
2019	480	501	525
2020	470	496	526
Total	3022	3107	3205

Source: Research findings

The results of FCF in each year that are shown in the **Table 4.11** need to be summed in order to obtain the total of present FCF value in the pessimistic scenario using this equation

$$\text{DFCF}=\frac{FCF^1}{(1+WACC)} + \frac{FCF^2}{(1+WACC)^2} + \cdots + \frac{FCF^n}{(1+WACC)^n}$$

By doing so, the total present FCF value is 3,174 (in **USD** million). Furthermore, the same method is also apply to the FCF in the moderate and optimistic scenarios. Thus, the results in the moderate and optimistic scenarios.

As has been execute in the first scenario that these FCFs must also be calculate in order to get the total of FCF. Therefore, the result obtained is 3,685 (in **USD** million) as the total present FCF value in the moderate scenario with no change in the average annual growth rate.

The total present FCF value from the is 4,203(in **USD** million). Additionally, since all of these future FCF values have to be converted into present values, thus the values shown in the tables tend to be inversely with the average annual growth rate because these have all been discounted by the WACC that represents as future risk.

4.6 Terminal Value

TV plays as one of the key roles in the discounted cash flow process because it will estimates the value of a company in its stable growth. TV can be obtain by using

$$TV = \frac{FCF\ at\ the\ final\ year\ projection}{WACC+g}$$

As described, only the final period of future FCF in the year projection that used in the equation. Moreover, the g in the equation represents as the growth in a year before the final period of year projection. Thus, the results of TV in the pessimistic, moderate, and optimistic scenarios are as follows (in **USD** million) (see **Table 4.12**).

Table 4.12 Future Terminal Value

Scenario	**Future Terminal Value**
Pessimistic (3.23%)	9.117
Moderate(4.8%)	9.177
Optimistic(6.6%)	9.241

Source: Research findings

As in FCF, TV also needs to be discount by WACC in order to obtain its present value

$$DTV = \frac{TV}{1+WACC^{t}}$$

shows the discounting process. By doing so, then the results for the three scenarios are as follows (in **USD** million) (see **Table 4.13**).

Table 4.13 Present Terminal Value

Scenario	**Present Terminal Value**
Pessimistic (3.23%)	6.391
Moderate(4.8%)	6.433
Optimistic(6.6%)	6.478

Source: Research findings

4.7 Firm and Equity Value

Firm value represents as the value of a company. Firm value can be obtained after all of the calculation processes in FCF and TV have been done. The values of FCF and TV used are both present value. Moreover, in order to obtain the firm value, thus these two present values are summed as described by

$$EV = DFCF + DTV$$

Therefore, the results for pessimistic, moderate, and optimistic scenarios are as follows (in **USD** million) (see **Table 4.14**).

Table 4.14 Firm Value

Scenario	**Firm Value**
Pessimistic (3.23%)	9.413
Moderate(4.8%)	9.540
Optimistic(6.6%)	9.682

Source: Research findings

Table 4.14 shows the value of PT Adaro Energy Tbk, in the pessimistic, moderate, and optimistic scenarios. Furthermore, when each of these values minus total of net debt, then the equity value are obtain. Equity value is the actual value that is own by the shareholders. Unlike firm value, any kind of debt is not included in the equity value, so the value is really the net value of the company. Thus, the equity values of PT Adaro Energy Tbk, in three different scenarios are as follows (in **USD** million) (see **Table 4.15**).

Table 4.15 Equity Value

Scenario	**Equity Value**
Pessimistic (3.23%)	8.262
Moderate(4.8%)	8.389
Optimistic(6.6%)	8.531

Source: Research findings

The numbers above are obtained by subtracted with 1151 (in **USD** million) as the most current total debt of PT Adaro Energy Tbk,.