Analysis of Optimal Capital Structure in the Pharmaceutical Industry Companies Listed on the Indonesia Stock Exchange

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Research article

Abstract: Capital structure policy is used to help companies determine the optimal composition of capital between debt and equity. This study aims to determine the optimal capital structure of companies in the pharmaceutical industry listed on the Indonesia Stock Exchange for the 2015-2019 period. The data used is secondary data obtained from the financial statements of PT Indofarma Tbk, PT Herbal and Pharmaceutical Industries sido Appear Tbk, PT Kimia Farma Tbk, and PT Merk Tbk which are processed using the method of calculating the cost of capital and comparing returns. On Equity (ROE) with a weighted average cost of capital (Average Weight Cost of Capital). The results showed that PT Indofarmas Tbk had an optimal structure in 2015 and 2019. PT Industri Jamu and Pharmacy Sido Appear Tbk had an optimal capital structure from 2015 to 2017, and PT Kimia Farma Tbk and PT Merk Tbk had an optimal capital structure from 2015. 2015 to 2019. These results can be seen from the ROE generated by the company, which is greater than the WACC in each period.

Keywords: cost of capital; capital structure; the average cost of capital; optimum capital structure.

1. Introduction

The growth rate of Indonesia's business activities in the first quarter of 2019 was higher than the growth rate in the previous quarter. If the business world has determined the source of capital, it can be seen from the company's capital structure. Based on the Survey of Business Activities (SKDU) in quarter I-2019, the value of the Weighted Net Balance (WNB) was 8.65%, higher than in quarter IV-2018 which was 6.19% (Bank Indonesia, 2019). The activities of the business world are closely related to companies. The company is an organization that produces and sells to meet human needs by combining human, natural, and capital factors.

Capital is a company's assets consisting of: paid-up assets and activity result assets of the business itself (Munawir, 2006). The use of this capital will later determine the company's capital structure. The capital structure is the composition of the company's internal and external funding, where the company will use the capital structure for finance activity, business, and development efforts. Therefore, the company's capital structure is fundamental because it can affect the survival of a company or an industrial sector.

The industrial sector contributes to the Indonesian economy by contributing more than 20% of the national income (Ministry of Industry, 2017). According to the Indonesian Minister of Industry, the pharmaceutical industry is one of the main sectors contributing to Indonesia's economy. Revenue growth for the pharmaceutical industry in Indonesia is estimated to reach 11.4% CAGR in 2013–2022, with total drug sales in Indonesia until 2022 predicted to reach Rp.

188 Trillion (Kimia Farma, 2020). The pharmaceutical industry is acquired business activities approval from the Ministry of Health to carry out pharmaceutical production, research, and development activities.

According to the Ministry of Industry, the growth of the pharmaceutical industry in 2019 will be higher compared to 2018, at 18.57%. This growth was supported and influenced by a large number of companies in the chemical, pharmaceutical, health, and traditional medicine industries, namely, 206 companies. The company is in doing activities that need enough capital to run well. One source of funds comes from Domestic Investment (PMDN). The following graph shows the realization of domestic investment growth for the pharmaceutical sector.
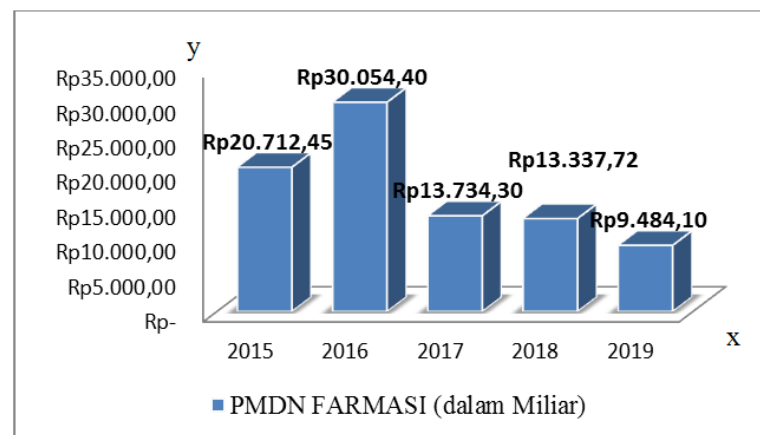

Figure 1. Graph of Domestic Investment in the Pharmaceutical Sector in 2015-2019
Source: Capital Investment Coordinating Board (Data is processed)

In Figure 1 above, it can be seen that domestic investment (PMDN) in the pharmaceutical industry increased in 2016 by 9,341.95 billion, which was caused by the revival of investor confidence to invest in the pharmaceutical sector after foreign investment from countries in Europe has increased. However, in 2017 it decreased by 16,320.10 billion. And followed by a decline in 2018 and 2019. In 2018, PMDN was 13,337.72 billion, and in 2019 it was 9,484.10 billion. The decline was caused by massive imports and the high logistics cost in Indonesia, which made investors wait to invest in the Indonesian Pharmaceutical Sector.

The researchers chose the pharmaceutical sector because, according to the Ministry of Industry, the pharmaceutical sector is one of the main sectors that contributes to the economy in Indonesia, which shows that the pharmaceutical industry is large and is closely related to society. In achieving the company's goals, there will be a problem that will affect the value of the company. One of them is the decrease in investment. With this decrease, researchers want to see how companies use or use their investments. Therefore, researchers are interested in researching the optimal capital structure in the pharmaceutical sector so that companies can develop plans to overcome these problems and it can be seen whether the capital structure is optimal or not. Because knowing the composition of the company's capital structure can help investors in making investment decisions.

According to Brigham and Houston (2011: 188), the capital structure will be influenced by several factors, including sales stability, asset structure, growth rate, taxes, market and internal company conditions, financial flexibility, and profitability.

Profitability shows the company's ability to profit from existing capabilities and resources like capital (Harahap 2015: 304).

The profitability ratio used in this study is the Return On Equity (ROE) ratio. The more ROE is getting higher strong company, and vice versa. Researchers use the ratio of return on

equity because in determining the use of capital, company management must also see whether, by adding capital, the company's owner will get a profit or, in other words, to measure the rate of return.

The debt used by the company can influence the rate of return generated from the investment. The ratio of leverage or solvency can show it. Leverage shows the capital structure's relationship between loan funds and fund owners (Chadha and Sharma, 2016). The ratio used namely the debt to equity ratio (DER). The reason is that DER is a capital structure ratio that shows the ability of its capital to meet its debts.

Optimal capital structure can be obtained with the smallest weighted average cost of capital (WACC), which in the end, can maximize the value of the company.

This study refers to previous research regarding Capital Structure Optimization Analysis. Research conducted by Japutra and Wijaya (2010) entitled "Optimal Capital Structure Analysis at PT. Telekomunikasi Indonesia, Tbk" showed that PT. Telekomunikasi Indonesia had an optimal capital structure from 2004 to 2008, which is indicated by the low weighted average cost of each capital compared to the value of its ROE.

In addition to the research compiled by Japutra and Wijaya (2010) mentioned above, there is also a reference to research results entitled "Optimal Capital Structure and Working Capital Analysis in Pharmaceutical Retail Companies" by Siregar et al. (2019). From this research, the results were obtained that in 2017 it produced the highest company value and the lowest WACC, so it was the best proportion.

In previous studies, in calculating (WACC), the cost of capital, the dividend discount model (DDM) method was used because dividend growth is constant (Damodaran, 2002). However, the researcher uses the Capital Asset Pricing Model (CAPM) method, which considers the influence of risk in stock investment. There is also a gap between the theory put forward by Riyanto (2013) and the research conducted by Japutra and Wijaya (2010). Riyanto's theory states that the optimal capital structure is the lowest WACC that generates maximum firm value. But in Japutra and Wijaya's research, the optimal capital structure is when the lowest WACC can maximize company value and is in a position where ROE is more significant than WACC. So, research is repeated to prove the theory.

2. Literature Review

2.1. Capital Structure Review

The capital structure is a permanent balance of short-term debt, long-term debt, preferred stock, and common stock. It can be described through the DER solvency ratio (Sartono, 2015).

DER is the ratio used to calculate the value of debt to equity. The formula used namely :

$$Debt\ to\ Equity\ Ratio = \frac{Total\ Liability}{Total\ Equity}$$

Source: Kasmir (2016)

2.2. Sources of Company Capital

Capital is a company's assets consisting of paid-up assets and assets resulting from business activities themselves (Munawir, 2006). Sources of capital can come from own capital and foreign capital (Riyanto, 2008).

2.3. Cost of Capital

The cost of capital is the actual cost incurred by the company to obtain sources of funds such as bonds (long-term debt), common stock, preferred stock, and retained earnings (Sutrisno,

2011). Generally, it consists of the cost of debt (Cost of Debt) and the cost of equity (Cost of Equity.) The cost of debt is the level of profit enjoyed by the holder or buyer of the bond. At the same time, the cost of equity is the cost used to pay for sources of capital (Modigliani and Miller, 1958).

The formula used To calculate the cost of debt, namely :

$$Kd^* = Kd\,(1 - T)$$

Source: Atmaja (2008)

Information :
Kd*: Cost of debt after tax
Kd: Cost of debt before tax
Q: The tax rate
The formula used To calculate the cost of own capital, namely :

$$Rit\ = Rf + \beta i(Rmt - Rf)$$

Source: Jogiyanto (2015)

Information :
Rit = Revenue of stock (i) in period t
Rf = Risk-free investment income
RMt = Market revenue in period t
βi = Coefficient of stock's systematic risk

2.4. Weighted Average Cost of Capital (WACC)

According to Ridwan and Barlian (2003:72), WACC shows a re-average of the expected future cost of capital. The lowest WACC will maximize the company's value.

The formula used namely :

$$WACC = (Wd\ X\ Kd^*) + (We\ X\ Ke)$$

Source: Prawironegoro and Purwanti (2008)

Information :
Wd: Composition of long-term debt
Kd*: Cost of long-term debt after tax
We: Total equity weight
To: Cost of equity (%)

2.5. Return On Equity (ROE)

ROE describes the efficient use of own capital with show ability to produce a profit on investment based on share capital (Kasmir, 2016).

The formula used namely :

$$ROE = \frac{Earning\ After\ Tax}{Total\ Equity} \times 100\%$$

Source: Kasmir (2016)

2.6. Optimal Capital Structure

Optimal capital structure, at the moment, marks the company's highest, which causes the lowest WACC (Sartono, 2012).

The formula used namely :

$$Firm\ Value = \frac{EBIT\,(1-T)}{WACC}$$

Source: Sartono (2011:228)

3. Research Method

Method research used a quantitative descriptive approach — the data form of secondary data. The population consists of pharmaceutical company that are registered in IDX and has published an annual report. Retrieval technique sample with method *purposive sampling* is a technique to determine the sample with standard certain (Sugiyono, 2018). Following criteria sample :

a) Company pharmacy registered in IDX in the year 2015 - 201 9.
b) Availability report finance on the period year 2015 - 201 9.
c) Availability of the necessary financial data for the period 2015 - 201 9.
d) Those who used millions of rupiah currency from 2015 – 2019.

After setting sample criteria, so obtained four companies that made the sample below:

Table 1. Research Sample

No.	Code	Name of Companies
1	INAF	PT Indofarma Tbk
2	SIDO	PT Industri Jamu and Farmasi Sido Muncul Tbk
3	KAEF	PT Kimia Farma Tbk
4	MERK	PT Merck Tbk

Source: www.idx.co.id (Data is processed)

Data collection was carried out with technique documentation. Analysis of the data with the formula used.

4. Results and Discussion

4.1. Result

Table 2. Calculation of Debt to Equity Ratio (DER)

Year	Ratio	Companies			
		INAF	SIDO	KAEF	MERK
2015	DER	158.76%	8%	74.84%	31%
2016	DER	139.97%	8%	103.07%	25%
2017	DER	191.55%	16%	122.11%	38%
2018	DER	190.42%	15%	173.24%	144%
2019	DER	174.08%	15%	147.58%	52%

Source: Annual Report Financial Statements, 2021 (Data is processed)

DER ratio has fluctuated from 2015 to 2019 with a ratio above 100%. This means that the company's debt is more significant than its net capital, but it is still relatively healthy because short-term debt causes a high DER value, not long-term debt. Meanwhile, the DER ratio of SIDO companies tends to be stable with a value below 100%, which means that the company's debt is smaller than its net capital, so it can be said that the company is still in a safe condition. The DER ratio of MERK companies has increased from 2015 to 2018, which means that the debt the company has to pay is getting bigger. But in 2019, it decreased as well as the KAEF company which experienced an increase from 2015 to 2018, but in 2019 it experienced a decline. The decrease in this ratio was caused by the greater use of own capital than long-term debt.

And usually, investors tend to choose companies with low debt to equity.

Table 3. composition of the capital structure

Tahun	Capital Structure	Composition							
		INAF		SIDO		KAEF		MERK	
		In million rupiah	In %	In million rupiah	In %	In million rupiah	In %	In million rupiah	In %
2015	Long Term Debt	94,269	13.72	13,737	0.53	285,696	13.30	35,668	7.00
	Financial Capital	592,703	86.28	2,598,314	99.47	1,862,097	86.70	473,543	93.00
	Total Capitalization	686,978	100.00	2,612,061	100.00	2,147,783	100.00	509,211	100.00
2016	Long Term Debt	100,946	14.92	14,043	0.51	644,946	22.11	40,640	6.52
	Financial Capital	575,757	85.08	2,757,885	99.49	2,271,407	77.89	582,673	93.48
	Total Capitalization	676,703	100.00	2,771,928	100.00	2,916,353	100.00	623,313	100.00
2017	Long Term Debt	110,175	17.31	262,333	8.31	1,443,941	30.61	46,598	7.04
	Financial Capital	526,410	82.69	2,895,865	91,69	3,273,911	69.39	615,437	92.96
	Total Capitalization	636,585	100.00	3,158,198	100.00	4,717,852	100.00	662,035	100.00
2018	Long Term Debt	118,466	19.26	66,634	2,24	2,436,990	37.02	35,396	6.39
	Financial Capital	496,647	80.74	2,902,614	97.76	4,146,258	62.98	518,280	93.61
	Total Capitalization	615,113	100.00	2,969,248	100.00	6,583,248	100.00	553,676	100.00
2019	Long Term Debt	438,173	46.46	55,980	1.79	3,547,810	32.37	37,964	6.01
	Financial Capital	500,935	53.54	3,064,707	98.21	7,412,927	67.63	594,012	93.99
	Total Capitalization	943,103	100.00	3,120.687	100.00	10,960,737	100.00	631,976	100.00

The composition of the capital structure determined by INAF, SIDO, KAEF, and MERK companies from 2015 to 2019 tends to use their capital rather than long-term debt. It means the company reduces the risks that will be faced in the future. According to Brigham and Houston (2014), the standard capital structure is optimal for 40% debt and 60% own funds. In this case, the KAEF company is closest to Brigham and Houston's capital structure.

4.2. Discussion

The optimal capital structure is when the lowest WACC can maximize firm value. When the company value is negative, it means that the company cannot provide benefits to investors.

Table 4. Firm Valur of ROE, WACC, INAF, SIDO, KAEF, and MERK

Year	ROE	WACC	Firm Value
INAF			
2015	2.39%	-50.48%	Rp(81,614.91)
2016	-3.02%	347.85%	Rp7,233.77
2017	-8.79%	97.58%	Rp(3,291.28)

Year	ROE	WACC	Firm Value
2018	-6.59%	58.27	Rp(39,357.84)
2019	1.58%	-84.41%	Rp(13.44)
SIDO			
2015	16.80%	-13.30%	Rp(2,761,787.33)
2016	17.40%	2.41%	Rp18,027,313.31
2017	18.40%	5.58%	Rp8,601,480.60
2018	22.90%	46.52%	Rp1,328,971.03
2019	26.40%	64.84%	Rp1,184,820.77
KAEF			
2015	7.17%	-32.48%	Rp(902,834.50)
2016	12.36%	8.14%	Rp4,078,053.92
2017	11.79%	10.88%	Rp142,731,331.17
2018	13.25%	0.50%	Rp(1,052,317.02)
2019	-0.22%	-35.75%	
MERK			
2015	30.10%	-12.07%	Rp(1,158,650.91)
2016	26.40%	-18.99%	Rp(842,567.79)
2017	23.51%	-7.05%	Rp(2,218.093.30)
2018	224.46%	-58.44%	Rp(251,417.39)
2019	13.17%	-34.47%	Rp(273,299.71)

4.2.1. INAF

Viewed by comparing ROE with WACC in 2015 and 2019, INAF has an optimal capital structure. From ROE which is more significant than WACC, from 2016 to 2018, the capital structure is less than optimal because WACC is less than ROE. However, when viewed based on the company value, 2016 was the year with the highest company value, while the WACC in that year was not the lowest, so the concept of optimal capital structure does not apply to INAF companies. This was because the EBIT in 2016 was more significant than in 2017 to 2019, and the WACC in 2015 was negative, so the company's value was also negative. So this research cannot be supported by the research of Rahma et al. (2014), which states that the optimal capital structure is when WACC is lowest and firm value maximum.

4.2.2. SIDO

If the optimal capital structure is seen by comparing ROE and WACC, then from 2015 to 2017, SIDO has an optimal capital structure seen from ROE that is bigger than WACC. Whereas in 2018 and 2019, the capital structure was less than optimal, which is shown with WACC greater than ROE. This research can be supported by the research of Rahma et al. (2014) if a negative WACC is excluded because a negative WACC will also result in a negative company value. So that the lowest WACC and positive value in 2016 is the optimal capital structure because it maximizes company value. Research by Japutra and Wijaya (2010) states that the optimal capital structure can be seen from the ROE, which is higher than the WACC. Still, after calculating the company value, it can be seen that the ROE value, which is greater than the WACC, is not necessarily an optimal capital structure.

4.2.3. KAEF

By comparing ROE and WACC, it can be seen that KAEF companies had optimal capital

structures from 2015 to 2019. This research is supported by research by Rahma et al. (2014), where the lowest WACC and positive value in 2018 is the optimal capital structure because it produces maximum company value. And it is known that ROE which is more significant than WACC, is not necessarily an optimal capital structure.

4.2.4. *MERK*

The comparison of ROE and WACC shows that from 2015 to 2019, MERK has an optimal capital structure because ROE is more significant than WACC. Research by Rahma et al. (2014) was not successful in supporting this research because the lowest WACC, which is -58.44%, cannot maximize firm value. Meanwhile, the WACC with the largest value closest to zero can maximize the company's value. Based on the above, a higher ROE than WACC is not necessarily an optimal capital structure.

5. Conclusions

The composition of the capital structure of INAF, SIDO, KAEF, and MERK companies from 2015 to 2019 tends to be dominated by using their capital rather than using debt. This can also be seen from the DER. According to Brigham and Houston (2014), the optimal capital structure standard consists of 40% debt and 60% own funds. In this case, the KAEF company is closest to Brigham and Houston's capital structure.

The WACC that maximizes firm value is the lowest and is positive. The concept of optimal capital structure does not apply to INAF because the 2016 WACC is not the lowest, but it is produced because the company value is the highest, so in the 2015-2019 period, INAF does not yet have an optimal capital structure. This was caused by the 2016 EBIT being more significant than the 2017 to 2019, and because the 2015 WACC was negative, the company value was also negative. In the SIDO company, the optimal capital structure in 2016, with a WACC of 2.41%, is the best proportion. At the KAEF Company, the optimal capital structure is in 2018 with a WACC that maximizes company value by 0.50%. In the same way as INAF companies, the concept of optimal capital structure does not apply to MERK companies because the 2017 WACC is not the smallest WACC but produced the highest corporate value, so in the 2015-2019 period, MERK did not yet have an optimal capital structure. This is because the resulting WACC is negative, so the WACC that is closest to zero will produce the highest firm value.

Investors who will invest in companies in the pharmaceutical sector on the IDX should choose companies that can maintain company value well, such as SIDO companies. Even though there was a decrease in the company's value, the decline was not too high compared to KAEF.

For further research, the method of data analysis should be carried out by calculating the cost of capital using other methods.

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