





“Cost of capital and firm value: Evidence from Indonesia”

AUTHORS	Augustina Kurniasih  Muhamad Rustam Heliantono Endri Endri  
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Augustina Kurniasih, Associate Professor, Ph.D., Faculty of Economics and Business, Management Department, Universitas Mercu Buana, Indonesia.

Muhamad Rustam, Associate Professor, Ph.D., Faculty of Economics and Business, Management Department, Universitas Tanjungpura, Indonesia.

Heliantono, Lecturer, Faculty of Economics and Business, Accounting Department, Universitas Mercu Buana, Indonesia.

Endri Endri, Associate Professor, Ph.D., Faculty of Economics and Business, Management Department, Universitas Mercu Buana, Indonesia. (Corresponding author)



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Augustina Kurniasih (Indonesia), Muhamad Rustam (Indonesia), Heliantono (Indonesia), Endri Endri (Indonesia)

COST OF CAPITAL AND FIRM VALUE: EVIDENCE FROM INDONESIA

Abstract

Cost and capital structure are needed to evaluate the feasibility of the investments made by a company. This study aims to estimate and analyze the effect of the component of cost of capital (COC) and capital structure (CS) on firm value. Pulp & Paper companies listed on the Indonesia Stock Exchange (IDX) became the research sample for the 2013–2020 period. The research method applied is a moderation regression analysis approach. The empirical findings of the study prove that firm value is not influenced by the cost of debt (COD), while the cost of equity (COE) has a negative effect, and COC is positive. COC is a combination of the use of debt and equity, modeling by adding a CS variable as a moderating variable; this leads to the conclusion that COD and COE have a negative effect on firm value, whereas COC and CS have a positive effect. The finding of the role of CS as a moderating variable reveals that CS is a quasi-moderator variable and plays a role in increasing.

Keywords

cost of debt, cost of equity, capital structure, pulp & paper companies

JEL Classification

G30, G32, L64

INTRODUCTION

A company must bear the costs for the capital obtained from the financier used to finance asset investment. The source of asset financing is determined by the choice of capital structure (CS) between the use of debt and equity sources. The cost of capital (COC) is a weighted average of the costs of using equity and debt. Asset investment aims to increase the value of a company and has the implication of maximizing the welfare of the company's shareholders. Many approaches are used to measure firm value, one of which is Price to Book Value (PBV). COC is also a guide in determining the required rate of return for a capital budgeting project. Therefore, COC determines whether a company's investment project is accepted or rejected. Empirical conclusions about the effect of COC on firm value from several studies are still contradictory. Studies by Ibrahim and Isiaka (2020) concluded that COC has a negative effect on firm value in India and Nigeria. Different findings were revealed by Mohamad and Saad (2012), which prove that COC has a positive effect on firm value in Malaysia and Kenya. Pavel (2018) states that the traditional COC is not a relevant discount factor for assessing firm value. Kaviani et al. (2014) find that COC is insufficient to explain the firm value in Iran. Salehi et al. (2020) prove that the cost of debt (COD) has a negative effect on the value of financial firms in Tehran. Similar findings were obtained by Santosuosso (2014) who conducted research in Italy. Meanwhile, Akeem et al. (2014) found that COD does not affect the value of construction companies in Nigeria. Akeem et al. (2014) prove that the cost of equity (COE) has a positive and signif-

ificant effect on firm value. This finding is similar to the results of Cheng and Tzeng (2011) in Taiwan and Harahap et al. (2020) in Indonesia. Meanwhile, Supit et al. (2015) conclude that COE does not affect firm value in Indonesia.

The choice of CS between the proportion of debt and equity financing can affect firm value (Myers, 2001). The financing decision wants an optimal CS with the lowest COC that can maximize firm value (Aggarwal & Padhan, 2017). The debate on the impact of the choice of CS, especially the use of greater debt, both theoretically and empirically, has not yet reached a consensus as to whether it can increase or decrease firm value (Li et al., 2019). Dang and Do (2021) examine the impact of CS on firm value in several different industries. The CS has a positive impact on firm value in the food and beverage industry, while the wholesale trade and construction industry, as well as the real estate industry, have a negative impact. Vo and Ellis (2017) support the finding that debt financing has a negative impact on firm value. Several studies also support the finding that CS has a positive impact on firm value, as evidenced by; Jiraporn and Liu (2018), Mollik (2008), Shahnian et al. (2020), Khan et al. (2021), and Jihadi et al. (2021) found that leverage has a positive and significant effect on firm value. The choice of funding policy does not have an impact on firm value as evidenced by several empirical studies, including by Endri and Fathony (2020), Razak et al., (2020), and Endri et al. (2021) who found that leverage did not affect firm value. The contradictory empirical evidence is a research gap that becomes the motivation to carry out further evidence in the context of companies in Indonesia. The research was conducted to empirically prove the effect of COC and CS on firm value in the Pulp & Paper industry listed on the Indonesia Stock Exchange (IDX).

1. LITERATURE REVIEW AND HYPOTHESES

The success of a company in managing its resources is perceived by investors through the value of the company (Utami & Hasan, 2021). The value of the company can be proxied by the stock price that reflects the value of the investor's wealth (Sugianto et al., 2020). The ultimate goal of a company is to create and maximize company value (Brealey et al., 2012). Optimal CS policy through the choice between debt and equity can maximize shareholder wealth. The weighted average cost of capital (WACC), or better known as COC, can also be used to define firm value by discounting future cash flows. Firm value can be maximized if WACC is minimized (Chowdhury & Chowdhury, 2010). Debt policy affects COC and has implications for stock market prices (Landi et al., 2022). Myers (2001) states that the CS that could maximize the value of a company or share price is good. Correia and Cramer (2008) stated that the CS decision of a company will have important implications on the value of the company and its COC.

The theory of irrelevance CS put forward by Modigliani and Miller (1958) is that assuming there are no taxes and transaction costs and per-

fect information among the actors, the value of the company is independent of the choice between debt and equity. Furthermore, Modigliani and Miller (1963) consider tax factors and transaction costs because they consider the real capital market to be imperfect. Trade-off theory (TOT) by loosening tax assumptions, recommends companies choose between equity and stock by considering the balance between the benefits of tax shields and bankruptcy costs associated with debt financing (Kraus & Litzenberger, 1973). Companies that have debt and interest obligations will have a reduced taxable income. Thus, the company's debt becomes tax-deductible. This is a tax benefit for the company who has debt. Agency theory suggests that agency costs that arise due to conflicts of interest between ownership and management affect the choice of CS (Jensen & Meckling, 1976).

Pecking Order Theory (POT) suggests that the choice of financing starts from the lowest COC, which is sourced from internal companies, then from external financing where equity is the last option (Myers & Majluf, 1984). The first external funding source is debt. If debt has been used as the maximum, the last source of funding is equity. According to POT, the company's growing profits are a source of cheap and affordable internal financ-

ing less dependent on external funding. Companies that rely on external financing by increasing the proportion of debt can reduce shareholder value (Chen & Chen, 2011). Several empirical studies prove that high debt financing has an impact on decreasing firm value. Hang et al (2021) found a negative effect of leverage on firm value. Caskey et al. (2012) prove that with large debts future returns decrease. Furthermore, Vo and Ellis (2017) conclude that shareholder wealth can be maximized with low debt levels. Demirgüneş (2017) found that the effective use of debt can increase firm value in Turkey.

COD is determined by the creditor. The greater the COD, the higher the obligations of companies using debt. The higher the COD, the greater the tax benefits (Modigliani & Miller, 1963). On the other hand, a company that uses debt gives a positive signal because it indicates that the company is eligible for credit and increases capital for growth purposes. COE is an expense incurred by a company raising funds by selling common stock or using retained earnings for investment. Referring to the dividend growth model, COE is inversely proportional to the stock price. The value of the company is measured by the stock price, which means an increase in COE can cause a decrease in the value of the company. COE is the rate of return required by investors in evaluating equity in determining investment decisions (Raimo et al., 2020). Asymmetric information theory states that management has more information than investors and potential investors. Information on COC can reduce the difference between the two parties. The market gives a positive assessment of the higher COC, which signals that the returns to be obtained by the company will be greater than COC. Gomes et al. (2019) prove that a decrease in COC can increase firm value. Bhatnagar et al. (2015) state that there is a linear relationship between COC and firm value. Jezkova et al. (2020) found that COC has a positive influence on firm value.

The CS shows the proportion of asset investment financing using debt and equity. The proportion of debt and equity will determine a company's COC. Trade-off theory explains that companies get tax savings if using debt as a source of financing, but consequently, the company bears the costs of financial distress if the amount of debt continues to increase. The tax savings obtained by the company

by increasing the proportion of debt increases the value of the company's owner's wealth. Bandanuji and Khoiruddin (2020), and Mollik (2018) find that debt policy can increase firm value. Kaviani et al. (2014) stated that CS through the minimal COC can increase firm value. The CS proxied by the debt-to-equity ratio has a negative effect on firm value (Sahabuddin & Hadianto, 2019).

The research hypotheses that were tested empirically were:

- H1: COD has a positive effect on firm value.
 H2: COE has a negative effect on firm value.
 H3: COC has a positive effect on firm value.
 H4: CS moderates the relationship between COC and firm value.

2. RESEARCH METHOD

The study uses panel data with unit analysis of all pulp and paper sub-sector companies listed on the IDX for the period 2013–2020. The estimated variable data comes from the annual financial statements of the companies selected as the research sample. The data required is adjusted to the research needs, namely, total debt, total equity, total assets, interest payments on corporate loans, corporate tax rates, yields on Indonesian government bonds with a tenor of 10 years, daily closing share prices of companies, and daily composite stock price index (JCI). Data on stock prices and JCI were obtained from yahoofinance.com and/or idx.co.id. Data on government bond yields were obtained from Investing.com. Three research models were estimated using the panel data regression method, namely:

$$PBV_{it} = a_0 + b_1COE_{it} + b_2COD_{it} + b_3COC_{it} + b_4SIZE + \varepsilon_{it}, \quad (1)$$

$$PBV_{it} = a_0 + b_1COE_{it} + b_2COD_{it} + b_3COC_{it} + b_4SIZE + b_5CS_{it} + \varepsilon_{it}, \quad (2)$$

$$PBV_{it} = a_0 + b_1COE_{it} + b_2COD_{it} + b_3COC_{it} + b_4SIZE + b_5CS_{it} + b_6CS_{it} \cdot COC_{it} + \varepsilon_{it}, \quad (3)$$

where PBV = firm value; COE = cost of equity; COD = cost of debt; COC = cost of capital; CS = capital structure; $SIZE$ = firm size.

$CS \cdot COC$ is an interaction variable whose value is obtained from the multiplication between the CS moderator variable and the COC variable. There are four possible roles of moderator variables, which are: 1) The moderator variable (CS) has a significant effect (Model 2) and the $CS \cdot COC$ interaction variable is also significant (Model 3); this means that the moderator variable acts as a pseudo moderator (Quasi Moderator); 2) The CS moderator variable has a significant effect (Model 2) but the $CS \cdot COC$ interaction variable is not significant (Model 3); this means that the moderator variable is the Moderator Predictor; 3) The CS moderator variable has no significant effect (Model 2) but the $CS \cdot COC$ interaction variable is significant (Model 3); this means that the moderator variable acts as a Pure Moderator; and 4) CS moderator variable has no significant effect (Model 2) and $CS \cdot CS$ interaction variable is also not significant (Model 3); this means that the moderator variable is a Potential Moderator.

3. RESULTS AND DISCUSSION

Descriptive statistics on research variables are presented in Table 1. On average, pulp and paper companies have a relatively low market value. The mean PBV value was 0.966. For every 100 Rupiah, the PBV of the company gets a market valuation (price per share) of 96.6 rupiahs. Although some achieved a PBV of 4.175, which is FASW in 2019. TKIM in 2015 was a pulp and paper company with the lowest PBV of 0.137.

The average COE is 0.154. This means that the expected return on shares is 15.4% on average. The highest COE of 0.33 was owned by KDSI in 2015, while the lowest COE of 0.069 was owned by

ALDO in 2017. The research of Ezat (2019) found that the average COE of paper companies (including heavy industry in Egypt) from 1994–1998 ranged from 11.05% to 24.44%. The average COD is 0.039 or 3.9%. This shows that the cost of using debt from pulp and paper companies is relatively low. In comparison, the yield on 10-year government bonds in the 2013–2020 period averaged 7.47%. The lowest Indonesian 10-year bond yield was 6.94 in 2013, while the highest value was 8.22% in 2015. The highest COD experienced by SPMA in 2016 was 7.6%, which is also lower than the interest rate on government bonds highest. The lowest COD was 0.69% experienced by TKIM in 2020. The average COC for pulp and paper companies is 8.6%. The highest COC was 14.2% experienced by INKP in 2020, while the lowest COC was 3.9% experienced by ALDO in 2017. On average, the company is in an unsolvable condition, due to the average value of DER being 1.445. Every 100 rupiahs of equity bears 144.5 rupiahs of debt. If a company is liquidated, the company is unable to meet its obligations. The maximum DER value is 2.711 FASW in 2013. The company with the smallest CS is SPMA, which is 0.512 in 2020. From the overall research data, 82.14% of the pulp and paper companies are in an unsolvable state because the DER value is > 1 .

Model 1 proves that COC is the main determinant of firm value that has a positive effect. The next variable that gives the second biggest influence is COE that has a negative effect, while COD has no significant effect on firm value. Model 2 shows that COC has the largest and most positive influence on firm value. The empirical evidence of Model 2 is in line with the findings of Model 1. The next variable that gives the second biggest influence is COE and the effect is negative. If COE increases, the value of the firm decreases. COD in Model 2 is the third most significant variable. The effect is negative. If COD increases, the value of the firm decreases.

Table 1. Descriptive statistics

Statistics	PBV	COE	COD	COC	CS	SIZE (IDR)
Mean	0.966	0.154	0.039	0.086	1.445	20.661.657.358.309
Median	0.514	0.124	0.036	0.081	1.478	4.606.709.924.000
Max.	4.175	0.330	0.076	0.142	2.711	126.723.419.253.000
Min.	0.137	0.069	0.007	0.039	0.512	290.641.923.909
Std. Dev.	1.052	0.075	0.015	0.029	0.445	3.574.510.000.000

Table 2. Effect of COD, COE, COC on PBV of Pulp & Paper companies, moderated CS and controlled firm size (Fixed effect model)

Variable	Model 1		Model 2		Model 3	
	Coeff.	Sign	Coeff.	Sign	Coeff.	Sign
<i>C</i>	18.8882	0.0206	11.2514	0.1529	18.5541	0.0209
<i>COD</i>	-7.2835	0.3709	-18.9259	0.0302	-44.7423	0.0008
<i>COE</i>	-9.3234	0.0081	-20.2940	0.0001	-45.1335	0.0001
<i>COC</i>	17.1743	0.0445	45.1038	0.0006	58.8685	0.0000
<i>SIZE</i>	-0.6009	0.0311	-0.3894	0.1413	-0.5665	0.0299
<i>CS</i>			0.8086	0.0054	-0.6299	0.2960
<i>COC·CS</i>					29.7675	0.0104
<i>R</i> ²	0.8196		0.8491		0.8707	
Adj <i>R</i> ²	0.7796		0.8113		0.8346	
<i>F</i> -statistic	20.4497	0.0000	22.5035	0.000	24.1299	0.000

CS can moderate the relationship between *COC* and firm value. The coefficient of influence of *CS·COC* is 29.7675 with a significance level of 0.0104. The moderating variable of *CS* has a significant effect (Model 2) and its interaction with *COC* (*CS·COC*) is also significant (Model 3). This finding shows that the *CS* as a moderating variable is a Quasi Moderator because the moderator variable in the interaction variable has a dual function, that is, part of it functions as an independent variable and partly functions (influences) in the interaction variable. The positive interaction coefficient value means that the *CS* strengthens the effect of *COC* on firm value. Model 3 also finds that *COC* has a dominant influence on firm value. Model 3 also found that *COC* has a dominant and positive influence on firm value. The next variable that gives the second largest and most negative effect is *COE*. Similar to Model 2, *COD* in Model 3 is a variable that has a negative effect on firm value.

Empirical findings prove that *COC* has a positive effect on firm value. This finding is supported by Franc-Dąbrowska et al. (2021) who also prove that *COC* has a positive effect on firm value in Poland and the UK. Different research results were revealed by Doval (2018) who found that *COC* had a negative effect on firm value in the textile sector in Pakistan and the financial sector in Romania. In the case of Indonesia, pulp and paper sector companies use most of the debt. On average, the debt-to-equity ratio is more than one, and more than eighty percent of companies use a greater proportion of debt than equity to fund asset investments. Meanwhile, *COD* for pulp and paper companies is relatively

low, at 3.9% on average. This value is relatively low when compared to the average 10-year government bond yield of 7.47%.

CS as measured by debt to equity ratio was found to have a positive effect on firm value (see Table 3). This finding supports the debt signaling theory that companies that use debt show credibility as debtholders and are seen by the market as being able to use debt to increase company productivity so that their performance is expected to be better in the future. This finding supports several previous studies both at home and abroad such as research findings from Mollik (2018). By adding the *CS* variable as a moderator, it has changed the effect of *COD* from the original no effect to a negative effect on firm value. The increase in *COD* causes the company's debt burden to increase and the impact of the company value decreases. The greater obligation, if it cannot be completed properly, will cause the company's financial difficulties. Companies in financial distress are perceived by investors or the market to be unfavorable and have an impact on the decline in company value. The pulp and paper companies that were sampled during the 2013–2020 period showed the relatively high use of debt where the average DER value is greater than one. Rustam (2015) reveals different findings that prove that the use of long-term debt is lower than equity in non-financial sector companies in Indonesia. In addition, Rustam (2015) also found that the industrial sector-based *CS* has a larger proportion of debt. The debt level of pulp and paper companies, which is quite high in the composition of the *CS* can reduce the value of the company.

Based on equation 2 and equation 3, COD, COE, and COC show consistent results in both direction and level of significance. Separately, increasing COD and COE reduces firm value, but when the two costs are combined into COC it can increase firm value. This means that the combination of the two costs is responded to positively by the market. Investors like high returns but usually have a low-risk preference. According to POT, the company will use funding sources in order from low to high cost. So, first, the company will use retained earnings (the company's internal sources). The company will use external funding sources, namely debt, and finally, equity if internal financing is not sufficient. Table 1 shows that the average portion of the use of debt is higher than that of equity with a ratio of 1.445.

This also exists, since COD is cheaper than COE, which is an average of 3.9% compared to 15.4%. When these two sources of external funds are used, it will cause a certain amount of COC (an average of 8.6%). The value of a company will increase if the two sources of funding are combined effectively. The results of the study are supported by Mohamad and Saad (2012) who show a positive influence of COC on firm value.

This study found that an increase in COD causes the value of a company to decrease. The data shows that the average DER of pulp & paper companies on the IDX for the 2013–2020 period is greater than one. This means that the company is in an over-leveraged state. The level of debt used is beyond its optimal point so that the tax benefit (tax shield) from the use of debt is lower than the potential for bankruptcy that arises. Van Binsbergen et al. (2010) explained that the function of COD varies based on several characteristics, including company size, asset collateral, and cash flow. The findings of Van Binsbergen et al. (2010) reveal that over-leveraged costs are higher than under-leveraged costs and the expected default costs are half of the total cost of ex-ante debt.

The results of this study indicate that COE has a negative effect on firm value. Empirical evidence is different from the findings of Harjoto and Jo (2015) who conclude that COE has a positive effect on firm value. COE in this study was measured using the CAPM approach, which was measured

using the calculation of the beta coefficient (risk). The higher the risk, the higher the COE. If investors in pulp & paper stocks are risk-averse investors, then the increased risk causes interest in investing in stocks to decline so that the stock value will decrease.

In equation 2, firm size as a control variable has no impact on firm value. However, in equation- 3, by including the capital structure, firm size has a negative effect, which means that the equation 3 model increases its suitability. Companies with large total assets can reduce the value of the company due to the role of the company's dividend policy. Companies that have large assets need funds for these assets. If management relies on internal funding (from retained earnings), dividend distribution will be low. Investors view that companies with large total assets tend to set higher retained earnings than distributing dividends to shareholders (Endri et al., 2019). A similar explanation was conveyed by Hirdinis (2019) that the large total asset component of inventories and receivables can have implications for a decrease in a company's ability to pay dividends. If pulp and paper stock investors are risk averse, they will prefer high dividend payouts. An increase in dividend payments will increase the value of the company.

An increase in the proportion of debt in the CS can increase the value of a company. This finding proves Modigliani and Miller's theory with taxes, which states that the higher use of debt will increase tax savings and will increase firm value. The use of debt causes a reduction in tax payments so that cash flow increases. The increase in cash flow has an impact on the increase in the value of the company. This finding is in line with Akhtar et al. (2016) who state that leverage with a tax shield has a positive effect on firm value.

In equation 3, the interaction variable between CS and COC (CS*COC) has a significant effect, so SM functions as a pretending moderator or quasi-moderator. The positive sign of the CS*COC interaction variable means that CS as a moderator variable will increase the value of a company when interacting with CS. The role of CS as a moderating variable supports Myers (1984) who states that companies in the same industry and the ability to generate low profits will end up with relatively

high debt ratios. The use of debt to fund investment is a strategy that has been well calculated by management so that the use of debt does not result in significant financial distress costs. This strategy is accepted by the market as a positive signal that will increase the value of a company.

CONCLUSION

Based on the research findings, various evidences of the effect of COD, COE, COC, and CS on firm value are provided. COD does not affect firm value, COE has a negative effect and COC is positive. The use of CS as a moderating variable leads to the conclusion that COD and COE have a negative effect on firm value. CS and COC have a positive effect on firm value. The increasing use of debt as a source of funding provides a positive signal for the market so that stock prices increase. The increase in COC, which is the weighted average cost of the sum of COD and COE, can increase a company's value. The use of CS as a moderating variable can strengthen the effect of COC on firm value. The interaction of CS with COC has a positive effect on firm value. Thus, the CS is a quasi-moderator variable. The research findings recommend that it is necessary to consider COD, COE, COC, and CS factors in investment decisions in the pulp & paper subsector company shares because these factors can affect company value. Separately, COD and COE have a negative effect on firm value. However, the combination of debt and equity causes COC to have a positive effect on firm value. The greater the COC, the better the market perception of a company so that the value of the company is higher. Future researchers can conduct similar research on shares of other industrial sector companies. In addition, other factors can also be considered that determine the value of a company, for example, external factors.

AUTHOR CONTRIBUTIONS

Conceptualization: Augustina Kurniasih, Muhamad Rustam.

Data curation: Muhamad Rustam, Heliantono.

Formal analysis: Augustina Kurniasih, Endri Endri.

Funding acquisition: Muhamad Rustam, Heliantono.

Investigation: Augustina Kurniasih, Heliantono.

Methodology: Augustina Kurniasih, Muhamad Rustam, Endri Endri.

Project administration: Muhamad Rustam, Heliantono.

Resources: Augustina Kurniasih, Heliantono.

Software: Muhamad Rustam.

Supervision: Endri Endri,

Validation: Muhamad Rustam, Heliantono, Endri Endri.

Visualization: Augustina Kurniasih, Muhamad Rustam.

Writing – original draft: Augustina Kurniasih, Muhamad Rustam.

Writing – review & editing: Endri Endri.

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