

# The Effect of Interest Rate and Financial Leverage on Profitability and Firm Value in Manufacturing Companies in Indonesia Stock Exchange

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**Abstract:** *This study aims to examine and analyze the influence of interest rates and financial leverage on profitability and firm value. This study uses explanatory survey and research methods. The population in this study were all public companies as many as 531 companies until 2016. The target sample in this study were manufacturing companies listing successively from 2010-2016. The sampling technique was determined by purposive sampling technique and the criteria for sampling were 31 companies. The data used are secondary data sourced from manufacturing companies' financial statements during the period of 2010 - 2016. Data analysis was performed using structural equation modeling or Structural Equation Modeling (SEM), which in processing data using AMOS software. The results of the analysis show that the interest rate directly has a negative and significant effect on profitability, but financial leverage does not affect profitability. The interest rate has a positive and significant effect on firm value and financial leverage has a positive and significant effect on firm value. The results of the analysis also show that indirectly the interest rate has a significant effect on firm value through profitability. However, financial leverage does not affect the firm value through profitability. The results of this study support capital structure theory from Modigliani and Miller, trade off theory and signaling theory.*

**Keywords:** Interest Rate, Financial Leverage, Profitability and Firm Value

## 1. Introduction

In this era of globalization, the business world shows a mix that results in an increasingly fierce and transparent competition. This requires every company to be able to face and anticipate all situations in order to be able to survive and stay ahead in the midst of various conditions, especially in the context of achieving the company's main objectives. The main objective of the company is to increase the prosperity of the owners or shareholders, which is realized through increasing the firm value (Salvatore, 2005).

Enterprise value also known as firm value, is an important concept for investors, because it is an indicator for the market to assess the company as a whole. Mahendra et al (2012), state that company value is the price that prospective buyers are willing to pay if the company is sold. The firm value is a reflection of the addition of the equity of the company to the company's debt. There are several factors that influence firm value, namely macroeconomic factors such as interest rates, inflation, exchange rates and economic growth, company policy and company performance (Sudiyatno, 2010).

Interest Rate as a macroeconomic variable has a tendency to influence the capital market both directly and indirectly. Where changes in interest rates will be responded to directly by the capital market, so that changes that occur in these factors can result in changes in the capital market, namely increasing or decreasing stock prices (Hussainey, 2009, Naik and Padhi, 2012 and Ouma and Muriu, 2014). Theoretically the interest rate and stock price have a negative relationship (Tandelilin, 2010). Kyereboah-Coleman and Agyire-Tettey

(2008), examining the effect of macroeconomic variables on the Ghana Stock Exchange, found that credit interest rates affected the performance of the stock market. Similarly, empirical studies conducted by Hussainey et al., (2009), examine the effect of macroeconomic indicators on stock prices in Vietnam, finding that interest rates have a significant effect on stock prices. Naik and Padhi (2012), examining the effect of macroeconomic fundamentals on stock market prices in India, found that short-term interest rates influence stock prices.

Debt policy can be linked to firm value, where debt policy is a company policy about how far a company uses debt financing. The Trade off theory explains that the higher the company is funding debt, the greater their risk for financial difficulties because of paying too much fixed interest for debtholders each year with uncertain net income (bankruptcy cost of debt). In the study of Mardiyati (2012), debt policy has a positive but not significant effect on firm value. This is in line with the research conducted by Pratiwi (2016), stating that there is an influence of capital structure on firm value.

Profitability as an element of micro-fundamental factors is the result of implementation of company policy. and reflects the benefits of financial investment. Myers and Majluf (1984) argue that financial managers who use a pecking order theory with retained earnings as the first choice in fulfilling funds and debt as the second choice and issuing shares as the third option will always increase profitability to increase profits. Companies that have a high level of profitability will be attracted by investors, so that profitability can affect the value of the company. According to Mardiyati (2012), profitability has a significant positive effect on firm value. Increasing demand for shares will lead

to increased firm value. This is also in line with the research conducted by Bone (2013), profitability has a positive and significant effect on firm value, because management makes sales increase, avoids inefficient expenditure and its research findings support Signaling Theory.

Efforts to find out the causal relationship between profit and debt policy have been carried out by several researchers including Myers and Majluf (1984), Anuchitworawong (2000), Chen Li and Chen Yu (2011), Kalpana (2014) and Mahmoudi (2014) who states that there is a negative relationship between profitability and leverage. Meanwhile Herdiana and Endang (2013), Ritonga et al., (2014), Kumar (2014) found a different matter where leverage with profitability was positively related if market control of the company was not effective. Conversely, if market control over the company is effective, there is a negative relationship between profitability and company leverage. Magginson (1997) argues that the tendency in companies in an industry is that profitability is inversely related to leverage, because profitable companies tend to have fewer loans. Likewise according to the pecking order theory, profitability has a negative effect on leverage.

Theoretically by Mesulis and Trueman (1998), Chen and Stainer (1999) and Modigliani and Miller (1958) state that debt policy will increase the value of the company, the higher the proportion of debt, the higher the stock price, but at a certain point the debt increase will decrease the value of the company.

Companies that are able to generate stable and increased profits can be seen as positive signals by investors related to company performance, so that a positive response will increase the value of the company. Thus higher profitability can increase firm value (Haugen and Baker, 1996; Chen and Stainer, 2000; Iturriaga and Sanz, 2001; Yang et al., 2010; Chen Li-Yu and Chen Shun-Yu, 2011; Risqia et al., 2012; Bone, 2013, Hermuningsih (2013)).

Based on the description above, this study aims to examine and analyze the direct effect of interest rates and financial leverage on profitability, the direct effect of interest rates, financial leverage and profitability on firm value. In addition, this study is also to determine the indirect effect of interest rates and financial leverage on firm value through profitability in manufacturing companies in the Indonesia Stock Exchange.

## 2. Theoretical Review

Modern capital structure theory begins with the paper Modigliani and Miller (1958), which is a new breakthrough in modern financial management. The propositions proposed by Modigliani and Miller have had very large supporters today. Propositions that state the irrelevance of financing decisions have important implications, namely the condition of how the decision becomes irrelevant, and implicitly also raises questions on the condition of how the decision becomes relevant (Harris and Raviv, 1991). After experiencing a very long discussion, Modigliani and Miller (1963), loosened one of his assumptions about the existence of corporate tax. That if there is corporate tax, then the

financing decision becomes relevant, the use of debt will increase the firm value. Various studies have enriched Modigliani and Miller's propositions by including tax factors, financial distress costs, bankruptcy costs, agency costs, and transaction costs (Myers, 1984 and Jensen & Meckling, 1976).

Pecking order theory is a form of development from the theory of Static Trade-Off (STO), which was proposed by Myers and Majluf (1984). According to this theory, the determination of optimal capital structure is based on hierarchical funding decisions based on the cheapest capital costs sourced from internal funds (profits) to external funding sources (debt and shares). At first this theory lacked theoretical support and empirical evidence (Baskin, 1989), but later after obtaining an injection of support from the information asymmetry argument, in addition to tax profit arguments, and significant transaction costs, the pecking order theory is more widely known (Myers, 1984; Myers and Mjuf, 1984). According to Brigham and Houston (2011), Companies with profitable prospects will try to avoid the sale of shares and seek every new capital needed in other ways, including the use of debt that exceeds the normal capital structure target. Companies with less profitable prospects will tend to sell their shares.

### Interest Rate

Dronbusch et al., (2008), the interest rate is the level of loan repayments or other investments, above the repayment agreement, which is expressed as an annual percentage. Denburg (1986) explains that investors in making decisions to buy shares, in addition to the return to be obtained, also consider the interest rates obtained when the funds are deposited in the Bank. If the deposit interest rate tends to decline, investors will divert their funds to stock investment because the expectation of return is higher than interest income if the funds are deposited at the Bank. This condition will trigger an increase in demand for stock portfolios, and then will push stock prices to move up. If the increase in share price is felt by many issuers, it will encourage an increase in the value of the combined stock price index (CSPI).

### Financial Leverage

Weston and Copeland (2010), in its financial literature, explain that financial managers as one element of decision-making managers have decision-making functions in three main areas, namely; funding decisions, investment decisions, and dividend policies. Financial leverage refers to the use of securities that provide a fixed income, namely bonds or preferred shares. Sutrisno (2001), the leverage ratio shows how much the company's funding needs are spent with debt. If the company factor leverage is 0 then the company in its operations fully uses its own capital or without using debt. The lower the leverage factor, the company has a small risk if the economic conditions ruin. There are five leverage ratios that can be used by companies, namely 1) Total Debt to Total Asset Ratio, 2) Debt to Equity Ratio, 3) Time Interest Earned Ratio, 4) Fixed Charge Coverage Ratio 5) Debt Service Ratio,

### Profitability

Profitability is the company's ability to generate profits.

Profitability reflects the benefits of financial investment. Myers and Majluf (1984) argue that financial managers who use a pecking order theory with retained earnings as the first choice in meeting the needs of funds and debt as a second choice and issuing shares as the third option, will always increase profitability to increase profits. Profitability ratio is a ratio to measure a company's ability to earn profits in relation to sales, total assets and own capital (Sartono, 2008). This ratio is very much considered by an investor, as well as shareholders because it is related to stock prices and dividends to be received. Sutrisno (2001) argues that profitability ratios can be measured by several indicators such as profit margin (PM), return on assets (ROA), return on equity (ROE), return on investment (ROI) and earnings per share (EPS).

### The Firm Value

The purpose of financial management is to maximize the firm value. If the company runs smoothly, the value of the company will increase, while the value of corporate debt (bonds) is not affected at all (Mas'ud, 2008). According to Fama (1977), the firm value will be reflected in the price of its shares.

Theory of the firm examines how the company determines the combination of resources that are optimally owned to produce firm value (Hellmann T, 2005). The measurement of the firm value is proxied using: 1) Price to Book Value (Roosenberg et al., 1985), 2) Tobin's Q (Tobin, James, 1967), 3) M / B Ratio (Barker and Wurgler, 2002 and Huang and Ritter, 2005)

### Interest Rate and Profitability

According to Dronbusch et al., (2008), the interest rate affects corporate profits in two ways, namely 1) because interest is a cost, the more the interest rate, the lower the company's profit if other things remain constant. 2) The interest rate affects the level of economic activity that affects the company's profits. Based on these explanations, the first hypothesis is the interest rate has a negative effect on profitability.

### Financial Leverage and Profitability

According to Brigham and Houston (2011), financial leverage will provide 3 important impacts, namely 1) raising funds through debt, holding shares can control the company with a limited amount of equity investment, 2) creditors see equity or funds provided by the owner as a safety limit., 3) If the results obtained from the company's assets are higher than the interest rate paid, the use of debt will "leverage" or enlarge the taking equity or ROE. Companies that use financial leverage expect profits to be received greater than the fixed burden they will bear from the amount of funds used. Based on this, the second hypothesis is financial leverage has a negative effect on profitability.

### Interest Rate and Firm Value.

According to Dronbusch et al., (2008), interest rates that affect company profits can affect stock prices (common stock) in three ways, namely: a) changes in interest rates can affect the condition of the company, business conditions in general and the level of profitability of the company will affect stock prices in the capital market. b) changes in

interest rates will also affect the relationship between the acquisition of bonds and the acquisition of stock dividends, therefore the relatively strong attraction between stocks and bonds. c) changes in interest rates will also affect the psychology of investors in relation to investment in wealth, thus affecting stock prices. Theoretically the interest rate and stock price have a negative relationship (Tandelilin, 2010). Based on this, the third hypothesis is the interest rate negatively affectson firm value.

### Financial Leverage and Firm Value

Financial leverage occurs because the manager's policy in determining the source of financing uses external sources, especially debt. Trade-off theory or balancing theory, which is based on assumptions violations Modigliani and Miller (1963). The theory states that if corporate tax and bankruptcy costs are considered, the leverage relationship with firm value is non-linear. So, to a certain extent, the use of debt will increase the firm value, namely the use of debt, which provides benefits in the form of tax savings. But if at the point where the cost of bankruptcy exceeds the benefits of tax savings, the use of debt will reduce the firmvalue. Based on this, the fourth hypothesis is financial leverage has a positive effect on firm value.

### Profitability and Firm Value

The irrelevance dividend theory of Miller and Modigliani (1961) states that the firm value is only determined by its basic ability to generate profits and business risks. This statement is supported by Black and Scholes (1974), and Pettit (1976). With increasing profitability, the company means giving a positive signal to market appreciation that increases the value of the share of the manufacturing sector. The relationship between profitability and firm value based on signaling theory. Based on this, the fifth hypothesis is profitability has a positive effect on firm value

## 3. Methodology of Research

Research on the effect of interest rates and financial leverage on profitability and firm value uses quantitative methods with structural equation modeling (Ferdinand, 2014). The population in this study were all public companies listed on the Indonesia Stock Exchange as many as 531 companies until 2016 and the target sample was manufacturing companies. The sampling technique was purposive sampling technique, so that 31 manufacturing companies were selected. The data used are secondary data sourced from manufacturing companies' financial statements during the period of 2010 - 2016. By referring to the relationship between the dependent variables, namely company value (Y2), intervening variables namely profitability (Y1) which are endogenous variables and independent variables namely interest rates ( X1), and financial leverage (X2) which is an exogenous variable, are shown graphically in Figure 1

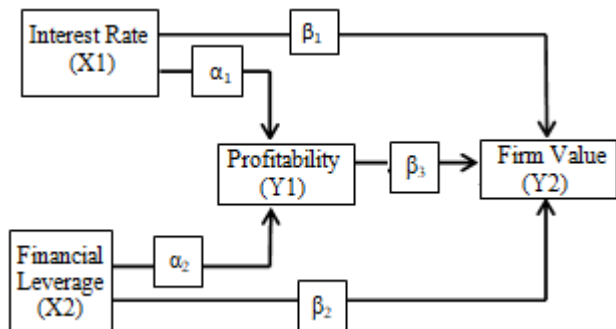


Figure 1

The research model influences interest rates and financial leverage on profitability and firm value in manufacturing companies in the Indonesia Stock Exchange

Based on the conceptual framework as shown in Figure 1, functional relationships can be formed as follows:

$$Y_1 = f(X_1, X_2) \tag{1}$$

$$Y_2 = f(Y_1, X_1, X_2) \tag{2}$$

Where:

X1: The interest rate is measured by the SBI interest rate during the study period

X2: Financial leverage is measured by debt to total equity

Y1: Profitability is measured by return on equity

Y2: Firm value is measured by Tobins'Q

Then from equation (1 - 2) a regression equation model is developed which is developed as follows:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \varepsilon_1 \tag{3}$$

$$Y_2 = \beta_0 + \beta_2 X_1 + \beta_2 X_2 + \beta_3 Y_1 + \varepsilon_2 \tag{4}$$

Where:  $\alpha_0$ , and  $\beta_0$  are constants,  $\alpha_1$ ,  $\alpha_2$ ,  $\alpha_3$ ,  $\beta_1$ ,  $\beta_2$ , and  $\beta_3$ , are estimated parameters, while  $\varepsilon_1$  and  $\varepsilon_2$  are error terms.

Based on the functional model, the form of reduce form in the simultaneous equation model (SEM) is obtained as follows:

$$Y_1 = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \varepsilon_1 \tag{5}$$

$$Y_2 = \beta_0 + \beta_2 X_1 + \beta_2 X_2 + \beta_3 Y_1 + \varepsilon_2$$

$$Y_2 = (\beta_3 \alpha_0 + \beta_0) + (\beta_3 \alpha_1 + \beta_1) X_1 + (\beta_3 \alpha_2 + \beta_2) X_2 + (\beta_3 \varepsilon_1 + \varepsilon_2)$$

$$Y_2 = \sigma_0 + \sigma_1 X_1 + \sigma_2 X_2 + \mu_1 \tag{6}$$

Where:  $\sigma_0 = \beta_3 \alpha_0 + \beta_0$ ,  $\sigma_1 = \beta_3 \alpha_1 + \beta_1$ ,  $\sigma_2 = \beta_3 \alpha_2 + \beta_2$ ,  $\mu_1 = \beta_3 \varepsilon_1 + \varepsilon_2$

To test the indirect effects of X1 and X2 on Y2 through Y1, Sobel Test Statistic is used (Sobel, 1982).

#### 4. Results and Discussion

##### Measurement Model Testing

This measurement model involves indicators and constructs, where in this study there are 4 constructs measured

variables, namely interest rates and financial leverage as independent variables and profitability and firm value as the dependent variable. Testing this measurement model is done to find out whether the measurement model is compatible or not to be used. Therefore in this test using the goodness of fit test (Ferdinand, A. 2014).Based on the overall model, it will then be evaluated based on the goodness of fit test criteria as shown in Table 1 below:

Table 1: Computing Criteria for Goodness of Fit Indices Testing Complete Models

Criteria	Cut-off Value	Computation Results	Description
Chi-Square	Expected a small	4,743	Fit
Relative Chi-Square	≤ 2.00	1,581	Fit
Sig Probability	≥ 0.05	0,192	Fit
RMSEA	≤ 0.08	0.052	Fit
CFI	≥ 0.90	0.998	Fit
TLI	≥ 0.90	0.988	Fit
NFI	≥ 0.90	0.994	Fit
IFI	≥ 0.90	0.998	Fit
RFI	≥ 0.90	0.969	Fit

Based on the test results as shown in Table 1 above, it can be seen that the value of the Goodness of Fit Indices for all criteria is in the fit category. Thus the overall measurement model in the study was very good.

##### Structural Model Analysis

Structural model testing is used after the overall fit model is obtained which aims to test the causal relationship between constructs or variables. The statistical test used is the t test which is based on critical value. The value of t count in AMOS program is indicated by critical ratio (cr). The following Figure 2 and Table 2 show the significance of the direct effect between the variables marked on the probability value if it is below  $P \leq 5\%$  or outside the  $\pm 1.96$  limit in the two-way test then it is said to be significant, whereas if it is within  $\pm 1.96$  area, then it is said to be insignificant (Sugiyono, 2006).

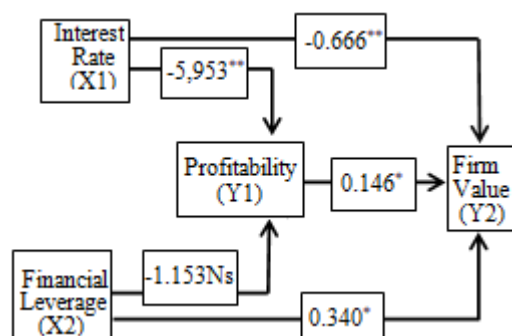


Figure 2: Functional Relationship between Interest Rate (X1) and Financial Leverage (X2) on Profitability (Y1) and Firm Value (Y2) Variables

**Table 2:** Results of Estimated Inter-Variable Functional Relationships (direct effect) Interest Rate (X1) and Financial Leverage (X3) on Profitability (Y1) and Firm Value (Y2)

Influence	Symbol	Estimate	SE	Critical Ratio (CR)	Probability (p-value)	Note
Y1 <--- X1	$\alpha_1$	-5.953	2.183	-2.727	0.006	Sig**
Y1 <--- X2	$\alpha_2$	-1.153	1.493	-0.772	0.440	Ns
Y2 <--- X1	$\beta_1$	-0.666	0.259	-2.569	0.010	Sig**
Y2 <--- X2	$\beta_2$	0.340	0.113	3.016	0.003	Sig*
Y2 <--- Y1	$\beta_3$	0.146	0.006	26.096	0.000	Sig*

Note: Sig \* = Significant 1%  
 Sig \*\* = Significant 5%  
 Ns = Not Significant

Table 2 above shows that of the five direct relationships there are four direct relationships that have a significant effect ( $p < 0.05$ ), namely the level (X1) of interest that has a negative and significant effect on profitability (Y1) and firm value (Y2) of 5.953 and 0.666, this indicates that if the interest rate (X1) rises 1 percent it will reduce profitability (Y1) and firm value (Y2) in the manufacturing companies listed on the Indonesia Stock Exchange in the period 2010-2016 by 5.953 percent and 0.666 percent. This result is in accordance with the first hypothesis and the third hypothesis of this study. Financial leverage (X2) and profitability (Y1) have a positive and significant effect on firm value (Y2) of 0.340 and 0.146 respectively, this indicates that if the proportion of financial leverage and profitability increases

by 1 percent it will increase the firm value in listed manufacturing companies on the Indonesia Stock Exchange for the period 2010-2016, respectively 0.340 percent and 0.146 percent. This result is in accordance with the fourth and fifth hypotheses of this study. While financial leverage (X2) does not affect profitability (Y1). This result is not in accordance with the second hypothesis of this study.

The indirect effects of exogenous variables, namely the interest rate (X1) and financial leverage (X2) on endogenous variables, namely firm value (Y2) through intervening endogenous variables, namely profitability (Y1), can be seen in Table 3 below:

**Table 3:** Results of Estimated Indirect Effects of Interest Rate (X1) and Financial Leverage (X2) on Firm Value (Y2) through Profitability (Y1)

Influence	Symbol	Estimate	Sobel Test Statistic	Probability	Note
Indirect Effect of Interest Rate (X1) on Firm Value (Y2) through Profitability (Y1)	$\alpha_1\beta_3$	-0.869	-2.710	0.007	Sig**
Indirect Effects of Financial Leverage (X2) on Firm Value (Y2) through Profitability (Y1)	$\alpha_2\beta_3$	-0.168	-0.772	0.440	Ns

Based on the Sobel Test Statistic as shown in Table 3 above, it shows that the indirect effect of Interest Rate (X1) on Firm Value (Y2) through Profitability (Y1) has a significant effect of -0.869. This indicates that if the Interest Rate rises it will reduce profitability so that it will reduce the Firm Value by 0.869. Thus Profitability (Y1) successfully mediates the effect of Interest Rate (X1) on Firm Value (Y2). While the indirect effect of Financial Leverage (X2) on firm value (Y2) through Profitability (Y1) shows no effect. This indicates that Profitability (Y1) does not succeed in mediating the effect of Financial Leverage (X2) on Firm Value (Y1).

**5. Conclusion**

By using the structural equation model (SEM) in 31 manufacturing companies listed on the Indonesia Stock Exchange in the period 2010-2016, it was found that directly the interest rate had a negative and significant effect on profitability and firm value in manufacturing companies. Likewise indirectly the interest rate has a significant effect on the firm value through profitability. This indicates that the increase in interest rates must be considered by investors who will invest in manufacturing companies because high interest rates can reduce company profits. Likewise, the management of the company must be careful if the interest

rate is high because it can reduce stock prices which have an impact on decreasing the firm value.

Financial Leverage directly has a positive and significant effect on the firm value in manufacturing companies. This indicates that the size of the debt held by the company is very much considered by company management because the greater the use of debt, the higher the firm value. Besides that, investors really see how the company management uses these funds effectively to achieve added value for the firm value. While Financial leverage directly does not affect profitability and profitability, it does not succeed in mediating the effect of financial leverage on the firm value. This indicates that the size of the debt owed by the company is not considered by investors because the use of debt does not have an impact on increasing profitability in manufacturing companies.

Profitability has a positive and significant effect on firm value in manufacturing companies. This indicates with high profitability can provide added value to the firm value reflected in the price of its shares. The results of this study support capital structure theory from Modigliani and Miller, trade off theory and signaling theory.

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