

The Co-Determinant of Capital Structure and Profitability Based on the Supply Chain Strategy: Evidence from Manufacturing Sector in Indonesia

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Abstract- This study aims to analyze the simultaneous relationship between supply chain strategy and profitability. This study will also analyze the effect of capital structure and profitability on firm value based on the supply chain strategy. Furthermore, it will analyze the factors that influence capital structure, profitability and firm value in manufacturing companies in Indonesia. The endogenous variables used are profitability, capital structure and firm value, while the exogenous variables used are firm size, growth, tangibility, liquidity, volatility, uniqueness, advertising and financial flexibility. The population of this research is manufacturing companies listed on the Indonesia Stock Exchange. The sampling technique used was the purposive sampling. There were 117 companies that became the research samples. The observation period began in 2010-2016, so the amount of the data used in this study became 819 units of analysis. The analysis technique uses path analysis. The results of the research showed that there was a simultaneous relationship between profitability and capital structure. Profitability and firm size have a significant effect on firm value, while capital structure and growth do not have a significant effect on the firm value. Firm size, growth, tangibility and capital structure affect the profitability, while liquidity, volatility and advertising have no significant effect on profitability. Firm size, uniqueness, financial flexibility and profitability have a significant effect on capital structure, while growth, tangibility, liquidity and volatility have no significant effect on capital structure.

Keywords: *capital structure; profitability; firm value; supply chain strategy; path analysis.*

1. Introduction

The speed of change and the uncertainty about markets evolution has made it more and more

important for companies to be aware of the supply chains they participate in. In other words, those companies that learn how to build and contribute in strong supply chains will have a significant competitive advantage in their markets. Foreign debt of Indonesian companies tends to increase. In 2010 private company debt was only 83.789 billion US dollars, but in 2018 it had increased to 190.928 billion US dollars. It also happens to manufacturing company debt. In 2010, the foreign debt of manufacturing companies was only 19.471 billion US dollars. In 2018, it has increased to 36.087 billion US dollars [1]. It has increased by 85.34% over the past eight years. Unfortunately, this increase was not accompanied by an increase in income. As a result, the ratio of debt to income or debt to service ratio (DSR) also increases. It can be proven by a phenomenon happened in 2010 that the DSR of non-financial private sector companies was only 3.1, but it became 4.2 in 2018. This condition raises a question, is debt good for the company? This question has long been a question of financial management experts, unfortunately there is still no consensus yet. Since Modigliani and Miller announced "irrelevance theory", many financial experts have responded to both support and reject this theory. In their presentation, Modigliani and Miller (1958) or better known as MM stated that the company's capital structure has no influence on the value of the company [2]. However, the insistent criticism of the assumptions used in this theory was the absence of taxes. Therefore, in 1963 Modigliani and Miller were forced to revise their opinions. They explained that the debt has a

positive influence on the value of the company with the assumption that there is a tax [3]. Yet, their opinions also received various responses. Trade-off theory, signaling theory, pecking order theory and other capital structure research are the effects of MM theory. In its development, it was found that the influence of capital structure on profitability. A research conducted by Abor found a negative effect of capital structure on the profitability [4]. Likewise, a research conducted by Dawar also found that capital structure had a negative effect on profitability [5]. In contrast, a research conducted by Gill, Biger and Mathur found that the capital structure had a positive effect on profitability [6]. At the same time, there are research that found the effect of profitability on the capital structure. Abor and Biekpe found a negative effect of profitability on capital structure [7]. On the other hand, a research conducted by Al Ani and Al Amri found a positive effect of profitability on the capital structure [8]. Up to now, there are no researchers who have conducted a study of the mutual relationship between capital structure and profitability. It also applies to research in Indonesia. There are no studies examining the simultaneous relationship between capital structure and profitability in companies in Indonesia. Therefore, further research on the simultaneous relationship needs to be conducted. This study aims to analyze the simultaneous relationship between the capital structure and the profitability. In addition, this study will also analyze the effect of the capital structure and the profitability on the firm value. Furthermore, it will also analyze the factors that influence capital structure, profitability and firm value in manufacturing companies in Indonesia.

2. Literature review

Service supply chains and manufacturing supply chains both belong to the field of supply chains. However, in the existing literature, supply chain management in the manufacturing industry is far more studied than supply chain management in the service supply chain. The research topic on the capital structure is a topic that always attracts the attention of many researchers in the field of finance. Capital structure theory was first coined by Durand in 1952 [9]. Durand stated that capital structure is a factor that is relevant to firm value. This opinion was denied by the "irrelevance theory" put forward by Modigliani and Miller in 1958 [3]. They stated that capital structure is a factor that is not relevant with the firm value. However, many researchers have criticized this

opinion since it is accompanied by strict assumptions, one of which is the absence of taxes. In 1963, Modigliani and Miller revised their opinion. By including the tax element, they stated that an increase in capital structure would increase firm value. Adding debt will reduce tax payments, because interest costs are deductibles before taxes. As a result, the addition of debt will reduce the cost of debt which will ultimately reduce the weighted average cost of capital (WACC). A decrease in WACC will increase firm value [10]. Frank and Goyal stated that there are three main theories of capital structure [11].

(1) trade-off theory. This theory was first introduced by Jensen and Meckling in 1976. They stated that companies that use debt will be able to increase firm value, but increasing the use of excessive debt will increase company risk. It will result in an increase in the cost of debt. Increasing the cost of debt will ultimately reduce the firm value. Therefore, it is recommended that companies always use debt to the optimal limit where the optimal limit is the condition of the marginal present value of the tax shield that is the same as the marginal present value of the cost of financial distress [12].

(2) Pecking order theory. This theory is based on asymmetric information theory between managers, creditors and shareholders. Myers and Majluf reject the idea of an optimal capital structure [13]. They stated that companies tend to firstly utilize the internal funds to meet their funding needs. The lack of funds is filled with the debt, while the equity is the final choice.

(3) The market timing theory. This theory also does not recognize the existence of an optimal capital structure [14]. The theory states that the issue of the composition of debt and equity only exists when market conditions are good. When market conditions are declining, the companies tend to buy back their shares. It means that the companies tend to use the debt rather than the equity.

This study will examine the relationship between profitability (Y1), Capital Structure (Y2) and firm value (Y3). Furthermore, it will also examine the effect of firm size (X1), Growth (X2), Tangibility (X3), Liquidity (X4), Volatility (X5), Uniqueness (X6), Advertising (X7) and Financial Flexibility (X8) on profitability (Y1), capital structure (Y2) and firm value (Y3).

2.1. The Relationship between Profitability, Capital Structure and Supply chain of Firm

Research conducted by Dawar in India found that the capital structure has a negative effect on profitability [5]. It means that increasing the debt of the companies in India both short-term debt and long-term debt will reduce the company's ability to generate profits. The similar study was also conducted in small companies in Sweden which found that capital structure had a negative effect on profitability [15]. In addition, research on small companies in Ghana and South Africa found that short-term debt has a negative effect on the profitability. In contrast, the long-term debt has a positive effect on the profitability [4]. On the other hand, many studies have found that profitability affects the capital structure. Pecking order theory states that companies that have the ability to generate profits tend to reduce the use of debt. It is because company management tends to use internal funds or retained earnings than the external funds [13]. Moreover, research on the companies in Iran found a negative effect of profitability on the capital structure [16]. Research conducted on the Kompas-100 index company in Indonesia also found a negative effect of profitability on the capital structure [2]. The similar result was also found by research conducted on manufacturing industry companies in Pakistan that there was a negative effect of profitability on the capital structure [17]. Referring to the trade-off theory, companies that have the ability to generate profits tend to be encouraged to use debt. Using debt increases the tax shield's incentive of interest costs. The research conducted on the companies in Vietnam found that profitability has a positive effect on the long term debt, but it has a negative effect on the short term debt [18]. The investors tend to like the companies that have the ability to generate high profits, so it can be concluded that the profitability has a positive effect on the firm value [19]. Research conducted by companies listed on the Indonesia Stock Exchange also found a significant positive effect of the profitability on the firm value [20]. Furthermore, the research conducted on an electronics company in Taiwan found a significant positive effect of the profitability on the firm value [21]. Trade-off theory states that the companies that have debt tend to increase the company value. A research conducted on the companies listed on the Indonesia Stock Exchange found a significant positive effect

of the capital structure on the firm value [20]. Meanwhile, the research on non-electronic companies in Taiwan found a significant negative effect of the capital structure on the firm value. However, the effect of the capital structure on the firm value for the electronics companies in Taiwan is insignificantly negative [21].

2.2. Firm Size (X_1)

According to pecking order theory, companies tend to use internal funds at the first place rather than the external funds sources. It means that the large companies tend to utilize internal funds rather than debt or it can be said that the effect of firm size on the capital structure is negative. A research conducted on manufacturing companies in Korea found that firm size has a negative effect on capital structure [22]. Meanwhile, the trade-off theory states that large companies tend to be more successful in diversifying, so they are able to control the company risk. As a result, they have more willingness to take on larger debt which means that the firm size has a positive effect on the capital structure. A research conducted on manufacturing industry companies in Pakistan found that firm size has a positive effect on the capital structure. Likewise, a research conducted on companies in China also found that firm size has a positive effect on the capital structure [12]. However, a research on companies listed on the Kompas 100 index in Indonesia did not find any significant effect of firm size on the capital structure [2]. In the trade-off theory, it is stated that large companies have a great ability in debt. The debt used here is intended to take advantage of tax savings on the interest costs. It results in increasing company profits. A research conducted in India found that firm size has a positive effect on profitability [23]. Other research in India also found that companies there enjoyed the economics of scale and at the same time they could test the effect of products on the market which resulted in the firm size that has a positive effect on the profitability [5]. Research in Indonesia on companies listed on the Kompas 100 index also found a significant positive effect of firm size on the profitability [24]. In this study, the firm value is measured by using Tobin's Q that is in line with the company's value [20]. The larger companies tend to have the ability to increase Tobin's Q than the smaller companies. A research conducted on companies listed on the Tehran Stock Exchange found that the firm size had a positive effect on Tobin's Q [25]. A research conducted in India also

found that the firm size has a positive effect on Tobin's Q [23].

2.3. Growth (X_2)

According to pecking order theory, the companies tend to utilize funds from internal sources first. Insufficient funds will be fulfilled from the debt, while the equity is the final choice to avoid asymmetric information. Meanwhile, the companies that have high growth tend to need large funds. As a result, they will utilize the debt other than the internal funding sources. That is why the growth has a positive impact on the capital structure [26]. A research conducted on companies in Indonesia also found that the growth had a positive effect on the capital structure [20]. In contrast, a research conducted on companies in the UK found that the growth has a negative effect on the capital structure [27]. In addition, a research conducted in 4 countries in the Asia Pacific region found that the growth in companies in Thailand, Singapore and Malaysia had a negative effect on the capital structure, while the growth in the companies in Australia had a positive effect on capital structure. [28]. A research conducted on companies in Iran also found that the growth had a negative effect on the capital structure [16]. The developing companies tend to have higher agency costs that can reduce the company profits. However, if the company can reduce its dependence on short-term debt and focus on long-term debt, the agency costs will decrease. This decrease will increase the company profits [29]. In other words, growth had a positive effect on profitability. A research conducted on companies in India also found that the growth had a positive effect on profitability [23]. This result is also consistent with research findings on companies in India which found that the growth results had a positive effect on profitability [5], but a research conducted on the companies in Borsa Istanbul found that the growth had no significant effect on profitability [30]. A company that has high growth is the investors' dream. The research on the companies in Indonesia found that the growth had a positive effect on the firm value [20]. Meanwhile, a research on companies in Korea also found that the growth had a positive effect on the firm value [31], while the research on Malaysian main board companies did not find any significant effect of the growth on the profitability [32].

2.4. Tangibility (X_3)

According to trade-off theory, the companies with large tangibility assets have lower bankruptcy costs since it is easier for the tangibility assets to

cash than the intangible assets in the event of bankruptcy. In addition, the large tangible assets can also be a guarantee in making loans, so it will reduce the risk if it is associated with the agency costs [19]. Research conducted on companies in Taiwan found that tangibility had a positive effect on the capital structure [19]. On the other hand, a research on the companies in Iran found that tangibility has negative relationship with short-term debt. This study also found a significant positive correlation between tangibility and the long term debt [16]. Furthermore, a research conducted on the companies in Pakistan found that tangibility has a negative relationship with capital structure [17]. [5] suggested that it is easier to monitor the tangible assets and it can be a very good guarantee that will reduce the agency costs. Reducing the agency costs will ultimately increase profitability. It means that tangibility has a positive effect on profitability. Research conducted on companies in India also found that tangibility has a positive effect on return on assets, but conversely tangibility has a negative effect on return on equity and Tobin'Q [23]. It is in line with research conducted on companies in Vietnam that found a negative influence of tangibility on profitability [33].

2.5. Liquidity (X_4)

Based on the *trade-off theory*, the companies that have high liquidity tend to have lower risk, making it easier to get debt. It means that liquidity has a positive effect on the capital structure. Conversely, according to pecking order theory, the companies with high liquidity will limit the use of the external funds, which means that liquidity has a negative effect on the capital structure. A research conducted by [28] found a negative effect of liquidity on the capital structure. Their research found that the companies in Thailand, Malaysia, Singapore and Australia tended to adopt the pecking order theory. These companies tend to use the internal funds rather than the external funds. In addition, a research conducted on the companies in Iran found that liquidity has a positive effect on the short term debt, while its relationship with long term debt is negative. This research also found that the companies with high liquidity tended to increase the short-term debt and at the same time reduce the long-term debt [16]. However, a research on the companies in Vietnam found a significant negative effect of liquidity on the short term debt, while for the total debt was significantly positive. The effect of liquidity on the long term debt is not significant which means that liquidity problems in Vietnam make companies limit the use

of long-term loans [18]. According to a research conducted on the companies in India, liquidity has a positive effect on profitability [5]. By doing good working capital management, the company can reduce the interest costs that can increase its profitability. A research conducted on the companies in Borsa Istanbul found that increasing liquidity in large companies tends to increase the return on assets [30]. It means that there is a significant positive effect of liquidity on profitability, but it does not apply to small companies. A research on the companies in Romania also found a positive effect of liquidity on profitability [34].

2.6. Volatility (X₅)

Volatility is a picture of a company's risk. Risk plays an important role in capital structure [16]. Trade-off theory suggests the high risk companies to reduce the use of debt [35]. It means that according to this theory, volatility has a negative relationship with capital structure. In a research on companies in Iran, it was found that there was a negative relationship between volatility and capital structure [16]. A research conducted on the companies in Pakistan found that they still depend on the bank loans, while the majority of banks are private property. They will not give loans to the companies which have high volatility. Therefore, the results of his study found a negative effect of volatility on the capital structure [17]. Moreover, research conducted on companies in China found a positive effect of volatility on the capital structure [12]. It means that even though the volatility of companies in China is relatively high, the company still adds the debt. This is because the majority of companies in China are owned by the Government where they get guarantees from the Government and can borrow large amounts of debt. The increased volatility illustrated by business risk will also increase profitability [34]. A research conducted on the companies in Borsa Istanbul found a significant positive effect of volatility on profitability in the old companies, while volatility in small companies and new companies had a significant negative effect on the profitability [30]. It means that a company that has been established for a long time has a good ability in managing company risk which can produce higher profit. On the contrary, the experience of small companies and new companies in managing risk is still not good which results in increased company risk which results in a decrease in corporate profits.

2.7. Uniqueness (X₆)

[in 36] affirmed that uniqueness has a negative effect on the capital structure. It is caused by the uniqueness or specialization of the company's products will result in high costs since the uniqueness requires the workers and suppliers to have specific skills and capital. This is extremely not liquid and is very difficult to turn to other businesses. For this reason, the companies will find it difficult to get loans, so the effect of uniqueness on the capital structure is negative. The results of this study are in line with a research conducted by [37]. On the other hand, [12; 22] found that the uniqueness does not have a significant effect on the capital structure.

2.8. Advertising (X₇)

A research conducted on the companies in India found a positive effect of advertising on profitability. The large expenditure on advertising funds will generate greater profits [5]. Other Indian studies have also found a positive effect of advertising on profitability [38].

2.9. Financial Flexibility (X₈)

Pecking order theory concludes that the companies with high profitability tend to reduce external financing. The theory also believes that managers prefer internal financing to external financing. The companies with more financial flexibility have less debt, because they omit the need for external financing by increasing their flexibility [16]. Furthermore, other researchers concluded that financial flexibility is the key to determine the optimal capital structure, and it is in line with trade-off theory. A research conducted on the companies in Egypt found that there was no relationship between financial flexibility and capital structure (long term debt), but there was a significant positive effect of financial flexibility on the short term debt [39]. In addition, a research conducted on the companies in Iran found a significant negative effect of financial flexibility on the capital structure (short term debt, long term debt and total debt) [16].

3. Research methods

3.1. Population and Sample

Within each organization the supply chain includes all functions involved in receiving and filling a customer request as well as new product development, marketing, operations, distribution, finance, and customer service. A supply chain is dynamic and entails the regular flow of information and product between different stages in supply chain. The population of this research is all

manufacturing companies listed on the Indonesia Stock Exchange. There are 144 listed companies. The sample selection utilizes purposive sampling, with the following criteria:

1. The company was listed on the Indonesia Stock Exchange before 2010.
2. The company did not experience delisting during the observation period.

From the selection results, there were only 117 companies that could be used in this study. The observation period began in 2010-2016, so the amount of data used in this study became 819 units of analysis.

3.2. Hypothesis

The hypothesis used in this study is as follows:

H₁. Capital structure has a negative effect on profitability.

H₂. Profitability has a positive effect on capital structure.

H₃. Profitability has a positive effect on supply chain and firm value.

H₄. Capital Structure has a positive effect supply chain and firm value.

H₅. Firm size has a positive effect on capital structure.

H₆. Firm size has a positive effect on profitability.

H₇. Firm size has a positive effect on firm value.

H₈. Growth has a positive effect on capital structure.

H₉. Growth has a positive effect on profitability.

H₁₀. Growth has a positive effect on firm value.

H₁₁. Tangibility has a positive effect on capital structure.

H₁₂. Tangibility has a negative effect on profitability.

H₁₃. Liquidity has a positive effect on capital structure.

H₁₄. Liquidity has a positive effect on profitability.

H₁₅. Volatility has a negative effect on capital structure.

H₁₆. Volatility has a positive effect on profitability.

H₁₇. Uniqueness has a negative effect on capital structure.

H₁₈. Advertising has a positive effect on profitability.

H₁₉. Financial flexibility has a negative effect on capital structure.

3.3. Collecting Data Method

The data in this research was collected from the company's financial statements published in the Indonesia Stock Exchange (www.idx.co.id). All data from endogenous variables (profitability, capital structure and firm value) and exogenous variables (firm size, growth, tangibility, liquidity, volatility, advertising and financial flexibility) come from the company's financial statements from 2010 to 2016.

3.4. Research Variables and Measurement

This study uses operational variables in table 1.

Table 1. Operational Research Variables

No	Variable	Ratio	Sources
1	Profitability (Y ₁)	$Profitability = \frac{Earning\ after\ Tax}{Total\ Assets}$	[40; 41]
2	Capital Structure (Y ₂)	$Capital\ Structure = \frac{Total\ Debt}{Total\ Assets}$	[29; 42]
3	Firm Value (Y ₃)	$Tobin's\ Q = \frac{Total\ Market\ Value + BV\ of\ debt}{Equity\ Book\ Value + BV\ of\ Debt}$	[20]
4	Firm Size (X ₁)	$Firm\ Size = Ln(Sales)$	[29]
5	Growth (X ₂)	$GO = \% \ Change\ in\ Total\ Sales$	[17; 16]
6	Tangibility (X ₃)	$Tang = \frac{Total\ Fixed\ Assets}{Total\ Assets}$	[16]
7	Liquidity (X ₄)	$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$	[16; 43]
8	Volatility (X ₅)	$Volatility = \frac{Std\ Dev.\ EBIT}{Total\ Assets}$	[10; 19]
9	Uniqueness (X ₆)	$Uniqueness = \frac{Research\ \&\ Development}{Total\ Revenue}$	[19]
10	Advertising (X ₇)	$Advertising = \frac{Selling\ Expenses}{Total\ Expenses}$	[5]
11	Financial Flexibility (X ₈)	$Financial\ Flexibility = \frac{return\ Earning}{Total\ Assets}$	[16]

4. Research Model and Data Analysis Technique

Based on the results of the aforementioned literature review, this research model can be shown in Figure 1.

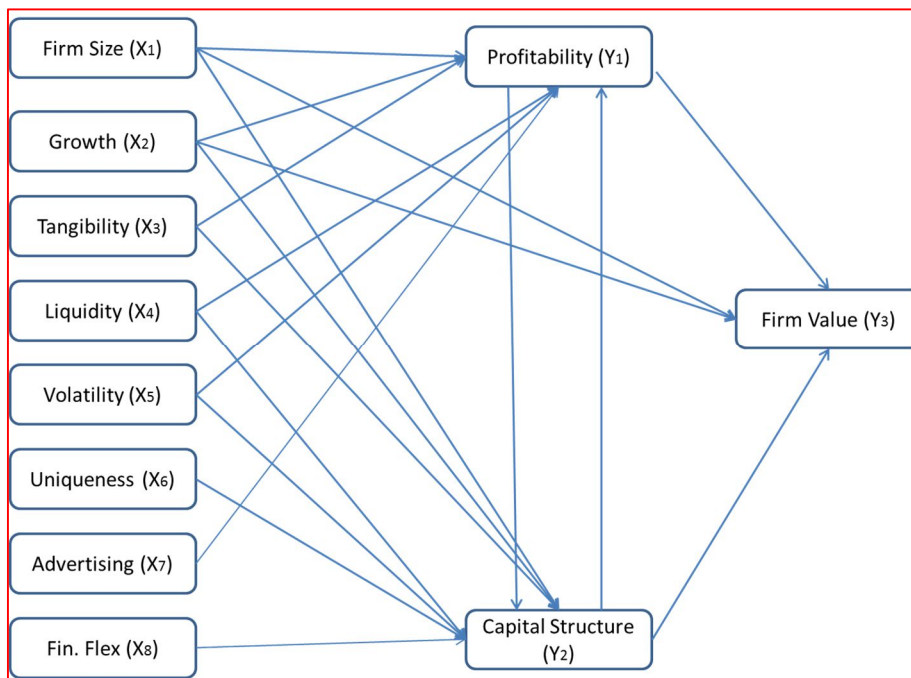


Figure 1: Path Diagram of Structural Model in Supply chain of firm

It means that the analysis technique used in this study is path analysis. The structural model of this research can be described as follows:

$$Y_{Prof} = \beta_1 Y_{CS} + \gamma_1 X_{Size} + \gamma_2 X_{GO} + \gamma_3 X_{Tang} + \gamma_4 X_{Liq} + \gamma_5 X_{Vol} + \gamma_6 X_{Adv} + \zeta_1$$

$$Y_{CS} = \beta_2 Y_{Prof} + \gamma_7 X_{Size} + \gamma_8 X_{GO} + \gamma_9 X_{Tang} + \gamma_{10} X_{Liq} + \gamma_{11} X_{Vol} + \gamma_{12} X_{Uniq} + \gamma_{13} X_{Finflex} + \zeta_2$$

$$Y_{FV} = \beta_3 Y_{Prof} + \beta_4 Y_{CS} + \gamma_{14} X_{Size} + \gamma_{15} X_{GO} + \zeta_3$$

Explanation:

$\gamma_1.. \gamma_{16}$ = Gama (Coefficient of Endogenous Variable)

$\beta_1.. \beta_4$ = Beta (Coefficient of Exogeneous Variable)

$\zeta_1.. \zeta_3$ = Zeta (Error term)

Y_{Prof} = Profitability

Y_{CS} = Capital Structure

Y_{FV} = Firm Value

X_{Size} = Firm Size

X_{Go} = Growth

X_{Tang} = Tangibility

X_{Liq} = Liquidity

X_{Vol} = Volatility

X_{Uniq} = Uniqueness

X_{Adv} = Advertising

$X_{Finflex}$ = Financial Flexibility

5. The Results of the Study

The research model needs to be tested first in order to be utilized in the research. The results of the model testing can be seen in table 2.

Table2. Test Results of Goodness of Fit

Goodness of Fit Index	Cut-off*	Results	Conclusion
Chi-Square		24.417	Marginal
Probability	$\geq 0,05$	0,020	
Cmin/DF	$\leq 5,00$	3,052	Fit
G F I	$\geq 0,90$	0,995	Fit
A G F I	$\geq 0,90$	0,955	Fit
T L I	$\geq 0,90$	0,824	Marginal
C F I	$\geq 0,90$	0,974	Fit
N F I	$\geq 0,90$	0,965	Fit
I F I	$\geq 0,90$	0,976	Fit
RMSEA	0,05 – 0,08	0,050	Fit

* source: [44]

Based on the test results in table 2, there are 2 marginal criteria found. The TLI value reaches 0.824 which is already approaching the critical point (0.900), so it still has not reached applicable or acceptable. Besides, chi-square which gets a large value (24,417) and a probability of 0.020 is caused by a large number of samples ($n = 200$), therefore, its probability cannot be calculated [44]. According to these results, it can be concluded that this model is appropriate to be used further in the research.

5.1. Hypothesis Test Results and Discussion

The results of the hypothesis test from this study can be seen in Table 3 and Figure 2. The results of this hypothesis test can be explained as follows:

5.2. Profitability, capital structure and firm value

The results of the hypothesis test in table 3 show that capital structure has a significant negative effect on profitability. These results indicate that manufacturing companies in Indonesia will reduce the use of debt in order to reduce the cost of debt and ultimately will increase the profits. It is in line with the research conducted in India [5], Swedia [15] and small companies in Ghana and Africa [4].

Table3. Hypothesis Test Results

Endogenous Variable	Exogenous Variable	Hypothesis	Estimate Parameters	t- value	P Value
Firm Value (Y ₃)	Capital Structure (Y ₂)	+	0.044	1.357	0.175
	Profitability (Y ₁)	+	0.513	15.379	0.000
	Firm Size (X ₁)	+	0.097	2.894	0.004
	Growth (X ₂)	+	-0.004	-0.113	0.910
Capital Structure (Y ₂)	Profitability (Y ₁)	+	0.186	5.5000	0.000
	Firm Size (X ₁)	+	0.068	2.650	0.008
	Growth (X ₂)	+	-0.003	-0.131	0.895
	Tangibility (X ₃)	+	0.017	0.710	0.478
	Liquidity (X ₄)	+	-0.028	-1.203	0.229
	Volatility (X ₅)	-	-0.014	-0.603	0.546
	Uniqueness (X ₆)	-	-0.053	-2.106	0.035
	Financial Flexibility (X ₈)	-	-0.856	33.195	0.000
Profitability (Y ₁)	Capital Structure (Y ₂)	-	-0.401	-9.539	0.000
	Firm Size (X ₁)	+	0.299	8.997	0.000
	Growth (X ₂)	+	0.068	2.053	0.040
	Tangibility (X ₃)	-	-0.111	-3.326	0.000
	Liquidity (X ₄)	+	-0.016	-0.477	0.633
	Volatility (X ₅)	+	-0.004	-0.109	0.913
	Advertising (X ₇)	+	0.016	0.478	0.632

The test results show that profitability has a positive effect on the capital structure. It is in line with the trade-off theory which states that increasing company profits tends to increase the debt. It means that the ability to generate profits for manufacturing companies in Indonesia will encourage the companies to increase their debt. It is supported by a research conducted in Vietnam [18].

Based on these results, the pecking order theory does not apply to manufacturing companies in Indonesia. Previous studies have also been carried out on the companies listed on the Kompas-100 index in Indonesia [2]. The results showed significantly negative impact. It proves that the manufacturing companies in Indonesia are more

likely to embrace trade-off theory rather than

pecking order theory.

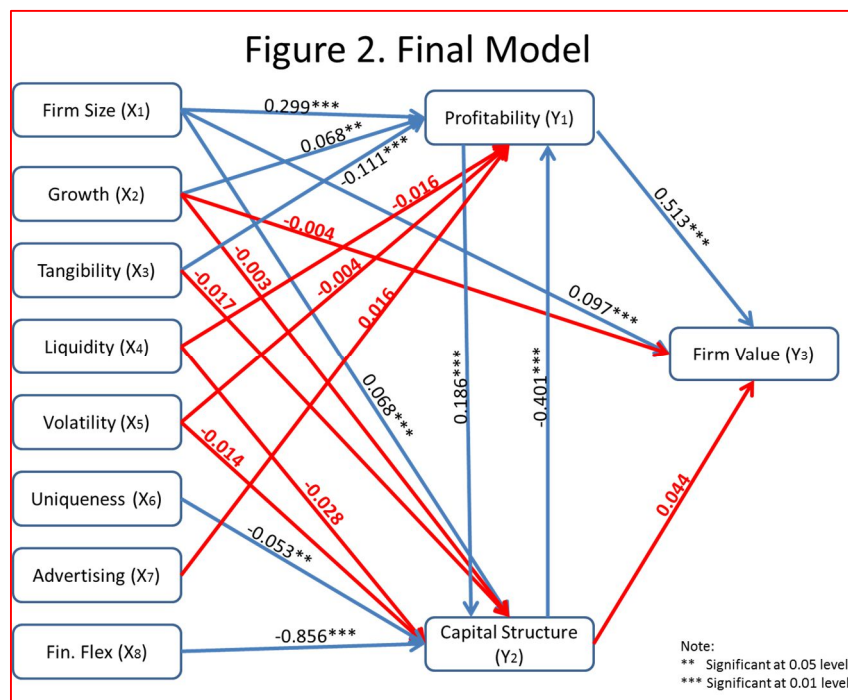


Figure 2: final model

From table 3, it was found that profitability has a significant positive effect on firm value. These results prove that the investors still choose companies that have the ability to generate high profits. It is in line with the results of the research on the companies in Taiwan [19], on the electronic and non-electronic companies in Taiwan [21] and on the companies in Indonesia [20]. Capital structure is not proven to have a positive effect on the firm value. The results of this study reject the results obtained from the research on the companies in Indonesia [20]. It also rejects the results of a research on the non-electronic companies in Taiwan, but it is the same as those of electronics companies in Taiwan [21]. It means that the investors in Indonesia are not really concerned on the capital structure of manufacturing companies. They are more concerned on the profit than the capital structure.

5.3. Firm Size (X₁)

Trade-off theory believes that large companies tend to take advantage of the debt because they are able to eliminate risk better than the small companies. The results of this study prove that firm size has a significant positive effect on capital structure. It means that large-scale manufacturing companies in Indonesia tend to use debt than smaller companies. This research is in line with a research on companies in China [12]. However, the results contradict the results of previous studies on the

kompas index 100 companies in Indonesia [2]. Large manufacturing companies in Indonesia tend to be more capable of making profits than small companies. They can take advantage of economics of scale where they can reduce the cost of production and generate higher profits. This study proves that there is a significant positive effect of firm size on profitability. It is in line with a research on companies in India [23; 5], as well as the research on the companies listed in Kompas 100 Indonesia [3]. Large companies are more capable of increasing company value than the smaller companies. This study found a significant positive effect of the firm size on the firm value. It indicates that the investors prefer manufacturing companies on a large scale than small scale since the large manufacturing companies are more capable of producing higher profits. This result is in line with a research on companies in Tehran Stock Exchange [25] and companies in India [23].

5.4. Growth (X₂)

According to pecking order theory, the companies that have high growth tend to utilize the debt. The aim is to avoid the asymmetric information [26]. This research cannot prove that belief since the results showed that growth has no significant effect on the capital structure. It rejects a research on the companies in Asia Pacific [28], the companies in Iran [16], the companies in England [27], and other Indonesian companies in general [20]. The results of this study found that growth has a positive effect

on profitability. It means that the companies that have high growth are more capable of generating profits. It is in line with a research on the companies in Pakistan [29], and the companies in India [23; 5]. Investors prefer to choose the companies with high growth since high growth pictures better prospects in the future. The results of this study found a significant positive effect on growth on profitability. It is in line with a research conducted in Korea [31] and the companies in Indonesia [20].

5.5. Tangibility (X₃)

According to trade-off theory, the companies with large tangible assets tend to increase the use of debt. The results of this study indicate that tangibility does not significantly influence the capital structure. It means that although tangible assets of manufacturing companies in Indonesia are quite large, this is not used as an excuse to encourage companies to take advantage of the debt. This result is not in line with a research on the companies in Taiwan [10], Iran [16], and Pakistan [17]. Large tangible assets will increase the company's fixed cost. Consequently, the company's profit will decrease. The results of this study indicate a significant negative effect of tangibility on profitability. It is in line with a research in India [23] and Vietnam [33], but it rejects other research in India [5].

SCM is the process of managing the movement of products from suppliers to buyers. A leading SCM includes the optimization of operational and strategic information and systems as well as business processes and business value in every stage of enterprise. Supply chains involve a range of different stages and the design of the supply chain will depend on both the roles of the stages involved and customer's needs. These supply chain stages include: Customers; Retailers; Wholesalers/Distributors; Manufacturers

5.6. Liquidity (X₄)

According to trade-off theory, the companies with high liquidity tend to use the debt. This theory is not proven in this study. The results showed that liquidity has no significant effect on capital structure. It means that the decision to use debt does not depend on the amount of company liquidity. It is not in line with a research on the companies in Asia Pacific [28], Iran [16] and Vietnam [18]. In addition, liquidity does not have a significant effect on profitability. It means that the reduction of the interest costs due to a good working capital management does not have too

much influence on the profitability of manufacturing companies in Indonesia. This result is not in line with a research in India [5], Borsa Istanbul [30] and Romania [34].

5.7. Volatility (X₅)

This study found that volatility does not significantly influence the capital structure. It means that the companies do not consider the risks that will be faced in making capital structure decisions. This result is not in line with a research conducted in Iran [16], Pakistan [17] and China [12]. Furthermore, volatility also does not have a significant effect on profitability which means that the companies that have high risk will not necessarily reduce the company's profit. This result is not in line with the research conducted [30; 34].

5.8. Uniqueness (X₆)

[in 36] pointed out that the creditors will make a unique company as the basis to refuse providing the debt. The results of this study indicate that there is a significant negative effect of uniqueness on capital structure. It means that the more unique a company, the more difficult to get a loan. This result is in line with the research [37].

5.9. Advertising (X₇)

The results showed that advertising does not have a significant effect on profitability. It means that advertising costs incurred by manufacturing companies in Indonesia are not effective in increasing company profits. This result is not in line with a research conducted in India [5; 38].

5.10. Financial Flexibility (X₈)

According to pecking order theory, the companies that have high financial flexibility tend to reduce the use of debt. The results of this study found a significant negative effect of financial flexibility on capital structure. It is in line with a research conducted in Iran [16].

6. IMPLICATIONS AND CONCLUSIONS

SCM is a collaborative-based strategy which connects inter-organizational business processes to create a shared market opportunity. The results of this study found a simultaneous relationship between profitability and capital structure. This finding has implications for the development of capital structure theory, specifically related to profitability. Capital structure has a significant negative effect on profitability. Instead, profitability has a positive effect on capital structure. These results reaffirm the fact that manufacturing companies in Indonesia

adhere to the trade-off theory. Companies tend to increase the use of debt when their profits increase. However, the use of debt that is too large resulted in a decrease in company profits. It means that the companies need to find an optimal capital structure. This result also answers the phenomenon that the increase in debt of non-financial companies in Indonesia is not accompanied by an increase in income which causes an increase of DSR. The main consideration of the investors in choosing the companies is profitability. The ability of a company to generate profit is more important than to consider the capital structure. The low capital structure which can generate profits will be the target of the investors. Therefore, the companies need to reduce their debt to achieve the optimal capital structure in order to provide high profits. This high profit will increase the firm value. The large companies are able to attract the investors. However, the investors will prefer large companies which can generate high profits. Manufacturing companies in Indonesia that have a large scale tend to be more efficient. Large companies enjoy the economics of scale which causes lower cost of production and can ultimately increase the profits [5]. The profits increase encourages an increase firm value. Large companies tend to be able to get larger loans, but the loans or the debts which are too large will not increase the profits. Therefore, an increase in debt is only recommended to the optimal capital structure, so it can generate profits and ultimately increase the firm value. Companies that have high growth did not get a positive response from the investors. The investors prefer the companies that have high growth and can generate profits in which they can increase the value of the company. The tangible assets of a large company will be a burden on the company. As a result, it will reduce their profit and value. For this reason, the companies should be more selective in procuring tangible assets to avoid increasing fixed costs. The increase in tangible assets will be profitable if it is accompanied by an increase in the production volume so that it can reach the economics of scale. The uniqueness of the companies will increase their risk that causes the creditors afraid of giving the debt. However, the low debt will increase the company profits which can ultimately increase the value of the company. Likewise, financial flexibility where the higher the company's financial flexibility, the less debt is used. As a result, by improving the SCM the company's profit increases, so does the company's value. It is recommended that the future researchers

examine the consistency of the results of this study by using samples from other sectors.

References

- [1] Bank Indonesia, & Ministry of Finance. *External Debt Statistics of Indonesia*. Indonesia, 2018.
- [2] Chandra, Teddy, Ng, M., & Chandra, S. *The determinants of capital structure and stock returns (the KOMPAS 100 index)*. *Opcion*, 34(14), 137–163, 2018.
- [3] Chandra, Teddy, Junaedi, A. T., Wijaya, E., Suharti, S., Mimelientesa, I., & Ng, M. *The effect of capital structure on profitability and stock returns: Empirical analysis of firms listed in Kompas 100*. *Journal of Chinese Economics and Foreign Trade Studies*, 12(2), 74–89, 2019. <https://doi.org/10.1108/JCEFTS-11-2018-0042>
- [4] Abor, J. Debt policy and performance of SMEs: Evidence from Ghanaian and South African firms. *Journal of Risk Finance*, 8(4), 364–379, 2007. <https://doi.org/10.1108/15265940710777315>
- [5] Dawar, V. *Agency theory, capital structure and firm performance: some Indian evidence*. *Managerial Finance*, 40(12), 1190–1206, 2014. <https://doi.org/10.1108/MF-10-2013-0275>
- [6] Gill, A., Biger, N., & Mathur, N. *The Effect of Capital Structure on Profitability: Evidence from the United States*. *International Journal of Management*, 28(4), 3–15, 2011. Retrieved from https://www.researchgate.net/publication/281004540_The_effects_of_capital_structure_on_profitability_Evidence_from_United_States
- [7] Abor, J., & Biekpe, N. How do we explain the capital structure of SMEs in sub-Saharan Africa? Evidence from Ghana. *Journal of Economic Studies*, 36(1), 83–97, 2009. <https://doi.org/10.1108/01443580910923812>
- [8] Al Ani, M. K., & Al Amri, M. S. *The Determinants of Capital Structure: an Empirical Study of Omani Listed Industrial Companies*. *Verslas: Teorija Ir Praktika*, 16(2), 159–167, 2015. <https://doi.org/10.3846/btp.2015.471>
- [9] Chen, J., Jiang, C., & Lin, Y. *What determine firms' capital structure in China?* *Managerial Finance*, 40(10), 1024–1039, 2014. <https://doi.org/10.1108/MF-06-2013-0163>
- [10] Chandra, T. *Analysis of factors affecting capital structure on listed company in kompas 100 index*. *International Journal of Applied Business and Economic Research*, 13(9), 7049–7066, 2015. <https://doi.org/DOI:10.13140/RG.2.1.3729.2400>
- [11] Frank, M. Z., & Goyal, V. K. *Capital structure decisions: Which factors are*

- reliably important? *Financial Management*, 38(1), 1–37, 2009. <https://doi.org/10.1111/j.1755-053X.2009.01026.x>
- [12] Chang, C., Chen, X., & Liao, G. *What are the reliably important determinants of capital structure in china?* *Pacific Basin Finance Journal*, 30, 87–113, 2014. <https://doi.org/10.1016/j.pacfin.2014.06.001>
- [13] Myers, S. C., & Majluf, N. S. *Corporate financing and investment decisions when firms have information that investors do not have.* *Journal of Financial Economics*, 1984.
- [14] Baker, M., & Wurgler, J. *Market Timing and Capital Structure.* *Journal of Finance*, 57(1), 1–32, 2002. <https://doi.org/10.1111/1540-6261.00414>
- [15] Yazdanfar, D., & Öhman, P. *Debt financing and firm performance: an empirical study based on Swedish data.* *The Journal of Risk Finance*, 16(1), 102–118, 2015. <https://doi.org/10.1108/JRF-06-2014-0085>
- [16] Alipour, M., Mohammadi, M. F. S., & Derakhshan, H. *Determinants of capital structure: an empirical study of firms in Iran.* *International Journal of Law and Management*, 57(1), 53–83, 2015. <https://doi.org/10.1108/IJLMA-01-2013-0004>
- [17] Ahmed Sheikh, N., & Wang, Z. *Determinants of capital structure: An empirical study of firms in manufacturing industry of Pakistan.* *Managerial Finance*, 37(2), 117–133, 2011. <https://doi.org/10.1108/03074351111103668>
- [18] Vo, X. V. *Determinants of capital structure in emerging markets: Evidence from Vietnam.* *Research in International Business and Finance*, 40, 105–113, 2017. <https://doi.org/10.1016/j.ribaf.2016.12.001>
- [19] Yang, C.-C., Lee, C., Gu, Y.-X., & Lee, Y.-W. *Co-determination of capital structure and stock returns—A LISREL approach , An empirical test of Taiwan stock markets.* *The Quarterly Review of Economics and Finance*, 50(2), 222–233, 2010. <https://doi.org/10.1016/j.qref.2009.12.001>
- [20] Hermuningsih, S. *Profitability , Growth Opportunity , Capital structure and The Firm Value.* *Bulletin of Monetary, Economics and Banking*, 115–136, 2013.
- [21] Chen, L. J., & Chen, S. Y. *The influence of profitability on firm value with capital structure as the mediator and firm size and industry as moderators.* *Investment Management and Financial Innovations*, 8(3), 121–129, 2011.
- [22] Kim, H., Heshmati, A., & Aoun, D. *Dynamics of capital structure: The case of Korean listed manufacturing companies.* *Asian Economic Journal*, 20(3), 275–302, 2006. <https://doi.org/10.1111/j.1467-8381.2006.00236.x>
- [23] Chadha, S., & Sharma, A. K. *Capital Structure and Firm Performance: Empirical Evidence from India.* *Vision: The Journal of Business Perspective*, 19(4), 295–302, (2015a). <https://doi.org/10.1177/0972262915610852>
- [24] Chandra, Teddy, Junaedi, A. T., Wijaya, E., Suharti, S., Mimelientesa, I., & Ng, M. *The effect of capital structure on profitability and stock returns: Empirical analysis of firms listed in Kompas 100.* *Journal of Chinese Economics and Foreign Trade Studies*, 12(2), 74–89, 2019. <https://doi.org/10.1108/JCEFTS-11-2018-0042>
- [25] Ghafoorifard, M., Sheykh, B., Shakibae, M., & Joshaghan, N. S. *Assessing the Relationship between Firm Size, Age and Financial Performance in Listed Companies on Tehran Stock Exchange.* *International Journal of Scientific Management & Development*, 2(11), 631–635, 2014. Retrieved from <https://search.ebscohost.com/login.aspx?direct=true&db=bth&AN=99978926&site=ehost-live>
- [26] Viviani, J. L. *Capital structure determinants: An empirical study of French companies in the wine industry.* *International Journal of Wine Business Research*, 20(2), 171–194, 2008. <https://doi.org/10.1108/17511060810883786>
- [27] Lasfer, M. A. *Debt Structure , Agency Costs and Firm ' s Size: An Empirical Investigation.* *Working Papers*, (0), 1999. Retrieved from <https://pdfs.semanticscholar.org/bacf/471d75d8a094fb782487ddbef769e23a4883.pdf>
- [28] Deesomsak, R., Paudyal, K., & Pescetto, G. *The determinants of capital structure: Evidence from the Asia Pacific region.* *Journal of Multinational Financial Management*, 14(4–5), 387–405, 2004. <https://doi.org/10.1016/j.mulfin.2004.03.001>
- [29] Ahmed Sheikh, N., & Wang, Z. *The impact of capital structure on performance: An Empirical Study of Non-financial Listed Firms in Pakistan.* *International Journal of Commerce and Management*, 23(4), 354–368, 2013. <https://doi.org/10.1108/IJCoMA-11-2011-0034>
- [30] Isik, O. *Determinants of Profitability : Evidence from Real Sector Firms Listed in Borsa Istanbul.* *Business and Economics Research Journal*, 8(4), 689–698, 2017. <https://doi.org/10.20409/berj.2017.76>
- [31] Oh, S., & Kim, W. S. *Effect of ownership change and growth on firm value at the issuance of bonds with detachable warrants.* *Journal of Business Economics and Management*, 17(6), 901–915, 2016. <https://doi.org/10.3846/16111699.2015.1072109>

- [32] Abdullah, N. A. I. N., Ali, M. M., & Haron, N. H. Ownership structure, firm value and growth opportunities: Malaysian evidence. *Advanced Science Letters*, 23(8), 7378–7382, 2017. <https://doi.org/10.1166/asl.2017.9479>
- [33] Quang, D. X., & Xin, W. Z. *The Impact of Ownership Structure and Capital Structure on Financial Performance of Vietnamese Firms*. *International Business Research*, 7(2), 64–71, 2014. <https://doi.org/10.5539/ibr.v7n2p64>
- [34] Vătavu, S. *The Impact of Capital Structure on Financial Performance in Romanian Listed Companies*. *Procedia Economics and Finance*, 32(15), 1314–1322, 2015. [https://doi.org/10.1016/S2212-5671\(15\)01508-7](https://doi.org/10.1016/S2212-5671(15)01508-7)
- [35] Wiwattanakantang, Y. *An Empirical Study on the Determinants of The Capital Structure of Thai Firms*. *Pacific Basin Finance Journal*, 7(3–4), 1999.
- [36] Titman, S., & Wessels, R. *The Determinants of Capital Structure Choice*. *Journal of Finance*, 43(1), 1–19, 1988. <https://doi.org/10.1111/j.1540-6261.1988.tb02585.x>
- [37] Li, Q., Yang, J., Hsiao, C., & Chang, Y.-J. *The relationship between stock returns and volatility in international stock markets*. *Journal of Empirical Finance*, 12, 650–665, 2005. <https://doi.org/10.1016/j.jempfin.2005.03.001>
- [38] Majumdar, S. K., & Chhibber, P. *Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance*. *Public Choice*, 98(287), 287–305, 1999. <https://doi.org/10.1023/A:1018355127454>
- [39] Eldomiaty, T. I., & Azim, M. H. *The dynamics of capital structure and heterogeneous systematic risk classes in Egypt*. *International Journal of Emerging Markets*, 3(1), 7–37, 2008. <https://doi.org/10.1108/17468800810849204>
- [40] Cekrezi, A. *Impact of Firm Level Factors on Capital*. *European Journal of Sustainable Development*, 2(4), 135–148, 2013.
- [41] Chandra, Teddy. *Faktor-Faktor Yang Mempengaruhi Struktur Modal Pada Perusahaan Properti dan Real Estate di Indonesia* <Factors Affecting the Capital Structure of Property and Real Estate Companies in Indonesia>. *Ekuitas*, 18(4), 507–523, 2014. <https://doi.org/10.13140/RG.2.1.2707.2405>
- [42] Lazăr, S. *Determinants of Firm Performance: Evidence from Romanian Listed Companies*. *Review of Economic and Business Studies*, 9(1), 53–69, 2016. <https://doi.org/10.1515/rebs-2016-0025>
- [43] Chadha, S., & Sharma, A. K. *Determinants of capital structure: an empirical evaluation from India*. *Journal of Advances in Management Research*, 12(1), 3–14, (2015b). <https://doi.org/10.1108/JAMR-08-2014-0051>
- [44] Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. *Multivariate Data Analysis*. In Pearson New International Edition (7th Editio), 2014. https://doi.org/10.1007/978-3-319-01517-0_3