



Determinants of Capital Structure and the Effect on Firm Value: Evidence from Indonesia

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

Article Information

DOI: <https://doi.org/10.9734/ajebe/2024/v24i61370>

Open Peer Review History:

This journal follows the Advanced Open Peer Review policy. Identity of the Reviewers, Editor(s) and additional Reviewers, peer review comments, different versions of the manuscript, comments of the editors, etc are available here: <https://www.sdiarticle5.com/review-history/118105>

Original Research Article

Received: 27/03/2024

Accepted: 29/05/2024

Published: 02/06/2024

ABSTRACT

Aims: To analyze the influence of macroeconomic factors (GDP Growth) and microeconomic factors (Tangibility and Profitability) on company value (Tobin's Q), as well as examine the mediating role of capital structure (Interest-bearing debt).

Study Design: The design of the study is quantitative research with a panel data regression approach and path analysis to examine the relationship between macro and micro economic variables on firm value, as well as the mediating role of capital structure in the relationship..

Place and Duration of Study: Companies included in the Kompas 100 index listed on the Indonesia Stock Exchange for the period 2018-2022.

Methodology: This study uses a population of companies listed in the Kompas 100 index on the Indonesia Stock Exchange for the period 2018-2022 and takes a sample of 70 companies that meet the criteria with purposive sampling method. A quantitative approach is used by analyzing panel data through panel data regression to test the effect of independent variables (GDP Growth, Tangibility, and Profitability) on the dependent variable (Firm Value) and the mediating variable

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(Capital Structure), as well as path analysis with the Sobel test to test the mediating role of Capital Structure in the relationship between the independent variable and the dependent variable.

Results: The regression analysis showed that GDP had no significant impact on either capital structure or firm value. However, company-specific factors like tangibility and profitability were the main determinants. Tangibility positively influenced capital structure, while profitability had a negative effect. Tangibility negatively affected firm value, and capital structure itself correlated negatively with firm value. Capital structure was only significant as a mediating variable in the relationship between profitability and firm value.

Conclusion: Macroeconomic indicators such as GDP have limited explanatory power on capital structure and firm value, whereas firm-specific factors like asset tangibility and profitability are crucial determinants of optimal capital structure and value maximization. Further studies should utilize alternative macroeconomic proxies with higher sensitivity, like interest rates and inflation, broaden the sample scope to incorporate SMEs alongside large corporations, control for relevant firm-level characteristics, extend the time horizon, and leverage sophisticated analytical techniques such as structural equation modeling.

Keywords: Capital structure; firm value; GDP growth; profitability; tangibility; capital structure.

1. INTRODUCTION

The determination of capital structure is a key element in a company's strategy, because it can have a significant impact on the company's value. The company management plays a role in designing the capital structure with the aim of optimizing company value. Each company has different needs and conditions, so they may choose different levels of financial leverage in an effort to achieve an optimal capital structure [1]. The source of financing for the operations and expansion of a corporate entity comes from two main components, namely equity capital, which is a contribution from shareholders, and external funding in the form of debt obtained from creditors. The specific proportion or composition between the two funding elements forms what is referred to as the company's capital structure. Determining the optimal capital structure, taking into account various factors such as cost of capital, risk, taxes, and growth opportunities, can have a significant influence on the valuation or market valuation of the company.

Capital structure theory originated from the research conducted by Modigliani et al. [2] which focused its analysis on the cost of capital. The research resulted in two main propositions. The first proposition states that under perfect market conditions and without tax considerations, there is no relationship between the composition of debt in a company's capital structure and the value of the company itself. However, the second proposition that revises the first proposition by incorporating corporate income tax elements produces the theory that the higher the

proportion of debt in the capital structure, the higher the valuation of the company, due to tax savings (tax shield) obtained from reducing interest expense on debt against taxable income.

The next development is the trade-off theory which states that the determination of the optimal capital structure for a company is the result of a balance between the benefits obtained from the use of debt, such as tax savings, with the costs incurred, including financial distress costs and agency costs that arise from conflicts of interest between shareholders, managers, and creditors [3]. On the other hand, the pecking order theory proposed [4] reveals that companies tend to choose funding from internal sources, such as retained earnings, first before seeking external funding sources in the form of debt or issuing new equity, to minimize information asymmetry and related costs that can reduce firm value.

Many elements can influence how a company's capital structure is formed, both from internal factors such as financial performance and company management, as well as from external factors such as overall economic conditions. In determining the optimal capital structure, companies consider various factors that can influence funding decisions [5-8] identify several important factors such as asset structure characteristics, the presence of non-debt tax shields, growth opportunities, uniqueness of products or services, industry classification, firm size, volatility of revenue streams, and profitability. In the international context [9] conducted a study on the determinants of capital structure using a large sample that includes companies from 37 countries, in order to analyze

the main determinants of capital structure decisions across countries. Reliable determinants for leverage are company size, tangibility, industry leverage, earnings, and inflation. Almost in line with the previous one, research conducted by Bennett [10] indicate a correlation between non-debt tax shields, asset composition, operational scale, and historical profitability with an entity's capital structure, where companies that have a higher level of risk tend to utilize debt funding sources in a larger proportion compared to safer companies. Furthermore, in a literature review conducted by Hang [11], the significant determinants of capital structure are ranked in order of importance, namely tangible assets (positively correlated), market value to book value ratio (negatively correlated), and profitability (negatively correlated). However, in research on oil and gas companies in the GCC (Gulf Council Countries) which consists of 6 countries (Saudi Arabia, United Arab Emirates, Kuwait, Oman, Qatar, and Bahrain) there are some differences in capital structure determinants, namely growth in sales, market to book value, and price to earning ratio are not significant as capital structure determinants, while size and tangibility (positive sign), and profitability (negative) are significant factors for capital structure [12].

Studies conducted by Ramjee [13] and [14] on companies in developing countries in Africa found that factors such as tangible assets, growth opportunities, size, and risk have a positive relationship with capital structure, while profitability and tax burden are negatively correlated with capital structure. The results also indicate that the capital structure decisions of South African firms tend to follow the pecking order theory and trade-off theory. The implication of trade-off theory is that there is an adjustment to the optimal leverage target to maximize firm value, while pecking order theory prioritizes the use of internal capital (retained earnings or profit reserves) which is considered more profitable and safe for the company, but does not deny the possibility of using external funds if internal funds are insufficient by choosing alternative funding sources that provide the lowest cost [15].

In addition to microeconomic internal factors, the literature also emphasizes the importance of considering macroeconomic external factors in determining the level of leverage of a firm. Various studies have underscored the significance of macroeconomic conditions in influencing firms' capital structure decisions

[16,17], However, there is an ongoing debate on how to measure macroeconomic conditions in a comprehensive and concise manner [14]. According by Cook and Tang [18] Macroeconomic conditions should have significant implications for a firm's decision in setting its capital structure target. This is based on the trade-off theory, which states that the optimal leverage level is determined by balancing the benefits of tax savings obtained from the use of debt with the potential costs of bankruptcy, where both factors depend on macroeconomic conditions. Ref. by Gomez-Gonzalez [19] asserts that the external environment, particularly macroeconomic conditions, plays a crucial role in the financing decisions taken by companies. When the economy experiences favorable growth, companies tend to obtain better cash flows, thus reducing the need to seek external funding, and vice versa. Empirically, there is a significant relationship between corporate financing decisions and four macroeconomic factors, namely inflation, the growth rate of Gross Domestic Product (GDP), the value of GDP itself, and an index that measures the protection of creditors' and debtors' rights [20]. Research examining the influence of macroeconomic factors on corporate financing decisions in Indonesia, Thailand and Malaysia yields mixed findings. For companies in Indonesia and Malaysia, there is a significant relationship between Gross Domestic Product (GDP) and financing decisions, but with different directions. For companies in Indonesia, GDP has a negative relationship, while for companies in Malaysia, the relationship is positive. On the other hand, the coefficient of inflation rate shows a negative value in all three countries, although it is only statistically significant in Indonesia and Malaysia [21].

Various studies also combine macro and micro economic factors to determine capital structure decisions. [22], who researched micro factors in his research, also added macroeconomic elements namely GDP, government debt, exports, income tax rates, money supply, inflation, and others. Ref. by Khémiri [23,79,80] included the macroeconomic elements of GDP growth rate and inflation as control variables in his research. According ref. by Daskalakis et al. [24] found that from the macroeconomic side, namely credit expansion, has a relatively strong and positive impact, while inflation is not significant, and the interest rate shows an interesting change with a weak and negative impact before the crisis and becomes

strong and positive during the crisis. According by Ahmad et al. [25] conducted research in Nigeria stating that GDP Growth and Inflation were significantly negative and positive on firm value and exchange rates were significantly positive on firm value.

The companies selected in this study are companies with good performance or fundamentals, high liquidity and large market capitalization so that they can be said to be companies that are currently at the top of their performance in Indonesia. Indonesia as a developing country is very interesting to study because macro conditions tend to be not yet stable but the performance of companies has shown significant development.

This study aims to find empirical evidence that influences corporate capital structure as seen from macro factors (GDP Growth Rate) as well as from micro factors (Tangibility and Profitability) and will also connect it with firm value with capital structure as the mediator. The proxy for capital structure used in this study is leverage (debt ratio in general) but what distinguishes it is that the debt used as research data is interest-bearing debt. Another interesting thing in this study is that it is conducted in a developing country (Indonesia) with relatively unstable macro conditions and the companies selected in this study are companies with good performance or good fundamentals with high liquidity and large market capitalization so that it can be said to be companies that are currently at the top of their performance in Indonesia

1.1 Literature Review and Hypothesis Development

1.1.1 Modigliani and miller theorem

In an effort to understand the relationship between capital structure and firm value, various theories have been developed conceptually and empirically based on previous studies. The theory at the root of this discussion is the theory introduced by Modigliani and Miller (1958), known as "MM Theorem". This theory examines the relationship between capital structure and firm value. The first proposition of MM theory, known as Proposition I, states that assuming the absence of taxes, there is no relationship between the capital structure set by the firm and the value of the firm itself, [26] asserts that MM proves that the choice between debt and equity funding has no effect on firm value. Therefore, in

the context of a perfect capital market, company management does not need to worry about the proportion of debt and equity in its capital structure, because the combination between the two is as good as any other combination.

Despite being an important milestone in the discussion on capital structure, the debt irrelevance theorem proposed by Modigliani and Miller is based on assumptions that do not fully reflect real conditions. When these assumptions are removed, the choice of capital structure becomes an important determinant of firm value. In subsequent research, the initial theory was revised, known as Proposition II, which states that firms tend to utilize higher debt levels to increase firm value by considering tax aspects. This is due to the tax savings obtained from the use of debt, which can increase corporate profits. The model that considers tax aspects indicates that profitable firms should borrow more, as they have a greater need to shelter income from corporate taxes [27].

1.1.2 The trade-off theory

Empirical studies on capital structure are usually based on two competing yet interrelated theories, focusing on Agency Theory and information asymmetry, namely the trade-off theory and pecking order theory [28]. The essence of the Trade-off theory explains various discussions regarding optimal capital structure because the previous MM theory indicated discrepancies with some research. A company that is fully financed by debt will bear costs including bankruptcy costs, this makes the company unable to be fully financed by debt [29]. The capital structure trade-off theory considers the balance between the benefits and costs associated with the use of debt as a source of funding. On the one hand, there are benefits in the form of tax savings obtained from debt interest costs that can reduce the company's tax burden. However, on the other hand, there is a risk of higher interest costs if the level of debt exceeds a certain limit, which can increase the possibility of corporate bankruptcy [30]. Therefore, this theory suggests that firms should seek the optimum level of debt by balancing the tax-saving benefits of debt and the potential costs of bankruptcy associated with too high a level of debt.

Trade-off theory emphasizes that a firm should have an optimal capital structure target to maximize firm value. This means that any deviation from the optimal capital structure target must be readjusted [31]. This target capital

structure is unique to each firm and may change over time according to changes in economic conditions and the firm's business strategy. Trade-off theory predicts that the marginal tax benefit of debt should equal the expected marginal bankruptcy cost [32]. This theory overcomes the limitations of the Irrelevance Theory by incorporating consideration of the impact of costs (such as bankruptcy costs) and benefits (such as tax protection) of using debt in a firm's capital structure decision. The Trade-Off Theory states that the optimal leverage ratio (i.e. debt to equity ratio) can be achieved by balancing the tax-saving benefits of debt financing with the costs of financial distress arising from bankruptcy risk and agency costs [33].

1.1.3 The pecking order theory

As an alternative to the Trade-Off Theory that emphasizes the use of debt to increase firm value, the Pecking Order Theory emphasizes the priority use of internal capital in funding corporate projects. If internal funds are insufficient, firms tend to prefer debt funding over equity due to the lower information costs associated with debt issuance [34]. This theory was developed by Myers (1983) who explained that companies should emphasize the priority order in financing based on the principle of cost efficiency. Pecking Order theory lists various funding sources to determine the optimal capital structure. The sequence starts from internal funding sources, namely retained earnings, followed by debt funding, and finally new equity issuance. The purpose behind this order is that internal funding (retained earnings) is cheaper than external funding (debt and new equity issuance) in an effort to maximize firm value [8,30,35].

According by Mateev [29] states that there is no target capital structure because companies choose leverage based on financing needs. Companies choose to use debt only if internal funds are insufficient to meet their investment needs, not because there are benefits from using debt (such as tax savings benefits, etc.). Profitable companies are companies that use less debt because companies that generate greater profits can finance their investments with internal funds [36]. Higher leverage is only for companies that require larger investments compared to those generated by the company [37] reveals the dominance of the pecking order theory in explaining corporate

capital structure theoretically. However [38] in his research states that studies conducted in developed and developing countries on capital structure find very diverse results, some studies support the trade-off theory and other studies support the pecking order theory concept.

1.1.4 The effect of GDP growth on capital structure and firm value

Countries that currently have higher GDP growth rates are often considered better because this reflects an increase in the country's economic growth. GDP (Gross Domestic Product) is often seen as the best metric for evaluating a country's economic performance [21]. According to Jaworski [20], GDP has not been detected to influence corporate capital structure but has a negative or positive relationship in determining debt depending on the company's internal factors. GDP per capita has a negative effect on capital structure which supports that the potential for rising stock prices during periods of economic growth should lead to lower leverage ratios by companies [39-41]. Contrary to previous results [40,42] found a negative and significant relationship between GDP and corporate capital structure.

GDP has an influence on firm value [43], where a high GDP level reflects economic growth in the community, thus impacting the ability of people to shop more which supports sales growth and profits for companies. This also impacts firm value. However, research conducted by Cliff and Willy [44] on manufacturing companies in Kenya, found that GDP results had no significant effect on firm value. Research conducted by Ahmad et al. [25] shows that GDP growth has a significant and negative impact on firm value.

1.1.5 Tangibility on capital structure and firm value

Companies that have a high proportion of tangible assets tend to have higher debt ratio targets because they have more reliable collateral to support their debt [45,46], this supports the trade off theory (TOT) which was previously believed. However, it should be remembered that using too much debt can also increase financial risk, especially if the assets cannot support the debt in bad situations. Therefore, companies must make prudent plans in determining the appropriate level of debt for their risk profile and needs [4,23,47,48] found a positive and significant relationship between tangibility and capital structure. In contrast to the

above results, research conducted by Alipour [46] found the relationship between tangibility and capital structure to be significant and negative, this is inconsistent with TOT because it is believed in Iran there is a lack of availability of long-term funding sources. Research in Greece also found a negative relationship between tangibility and capital structure [49].

Tangibility (tangible assets) is believed to influence firm value [50]. If a company has high tangible assets, agency costs associated with debt can be suppressed because these tangible assets can be easily used as collateral. As a result of the reduction in agency costs associated with this debt, an increase in firm value can be generated [51-53] found a positive and significant relationship between tangibility and firm value. In contrast to the research results of Ramli (2019) which states that Asset Structure has a negative relationship with firm value, this is inconsistent with the previous theory (TOT).

1.1.6 Profitability on capital structure and firm value

Profitability is a key performance indicator of the company and is one of the crucial considerations for investors in making investment decisions, where investors tend to be more interested in companies that are able to generate maximum profits. Companies with higher Return on Asset (ROA) levels tend to operate with lower leverage ratios. This is due to high retained earnings, which reduces the company's need to issue debt as a source of funding [18]. Empirical studies conducted by Im et al. [47,54] found a significant relationship between profitability and corporate capital structure [55] explained that there are two possible relationships between profitability and debt financing, namely a positive relationship that is in line with Trade-Off Theory and a negative relationship that supports Pecking Order Theory. Findings from Ramjee [13,23] studies reveal a negative relationship between profitability and leverage, confirming the existence of the Pecking Order Theory in explaining corporate financing behavior.

There is a significant relationship between profitability and firm value. Profitability is a reflection of the company's ability to generate profits, and logically, higher profits will contribute to an increase in firm value. This indicates a positive relationship between profitability and firm value [52,56-59]. These studies found that there is a significant effect of Return on Asset (ROA) as a measure of profitability on firm value.

1.1.7 Capital structure on firm value

Capital structure plays a crucial role in influencing firm value, with various possible compositions between equity and debt components. Several empirical studies found that capital structure has a positive and significant influence on firm value [48,60-62], This finding supports the concept of Trade-Off Theory which states that the use of debt within certain limits can increase firm value. On the other hand, research conducted by Doorasamy [63,64] in East African countries and Pakistan revealed a negative relationship between capital structure and firm value. These results indicate that higher debt levels actually have an impact on decreasing firm value, in line with Pecking Order Theory. Research conducted by Van Khanh [65] revealed that the relationship between capital structure and firm value is non-linear, which indicates that each company should have an optimal level of capital structure to maximize its value. Although most empirical studies find a positive and significant effect of capital structure on firm value, in line with the concept of Trade-Off Theory, some studies in developing countries reveal contradictory results. In these countries, a high level of debt tends to decrease firm value, consistent with the Pecking Order Theory. These findings suggest that there is an optimal point in the capital structure that can maximize firm value, which is highly dependent on the specific conditions and characteristics of each firm.

1.2 Conceptual Framework

Fig. 1 is the conceptual framework of this empirical study by looking at the relationship between variables.

Based on the conceptual framework above, the hypotheses of the research are:

- H1: GDP Growth affects Capital Structure
- H2: Tangibility affects Capital Structure
- H3: Profitability affects Capital Structure
- H4: GDP Growth affects Firm Value
- H5: Tangibility affects Firm Value
- H6: Profitability affects Firm Value
- H7: Capital Structure affects Firm Value
- H8: GDP Growth affects Firm Value through Capital Structure
- H9: Tangibility affects Firm Value through Capital Structure
- H10: Profitability affects Firm Value through Capital Structure

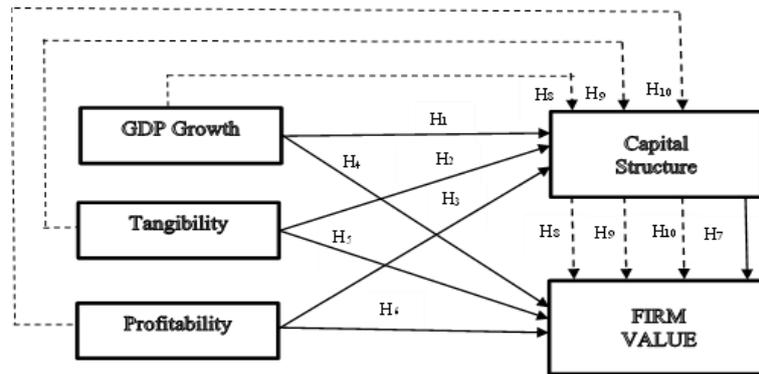


Fig. 1. Conceptual Framework

2. MATERIALS AND METHODS

2.1 Population and Sample

The population of this study encompasses companies listed on the Indonesia Stock Exchange, with a focus on firms included in the Kompas 100 index - an index that gauges the performance of the top 100 companies by liquidity and market capitalization. The index is updated biannually in February and August. The purposive sampling technique is employed to select the sample based on the following criteria: firms that have consistently remained within the Kompas 100 index during the 2018-2022 study period; non-financial companies, since financial

firms exhibit debt ratios divergent from other industries; and companies with complete data pertinent to the research variables. The exclusive non-financial company focus and consistent high-performer Kompas 100 inclusion allow for an effective sample that controls for industry and performance variation.

The details of the research sample can be seen in Table 1.

2.2 Operationalization and Measurement of Variables

The operationalization and measurement of the research variables can be seen in Table 2.

Table 1. Sample selection

No.	Sample Criteria	Does not match The criteria	Match Criteria
1.	The companies that are included in the Kompas 100 index		100
2.	The companies that have never dropped out from the Kompas 100 Index	(18)	88
3.	Non-financial companies	(12)	70
4.	Observation year		5
5.	Number of research data	5 years x 70 emiten	350
6.	Outlier data		-
7.	Number of research data for the period 2018-2022		350

Source: Writing team (2023)

Table 2. Operationalization and measurement variables

No.	Variable	Code	Indicator	Reference
1.	Capital Structure	LEV	Interest-bearing debt to equity	[66]
2.	Firm Value	FV	Tobin's Q	[67]
3.	GDP Growth	GDP	Income from factors of production	[68]
4.	Tangibility	TANG	Fixed assets to total asset	[42]
5.	Profitability	PROF	EBIT to total asset	[42]

Source: Writing team (2023)

2.3 Data Collection

2.3.1 Data type

This research uses secondary data, namely data obtained from library observation or company documents.

2.3.2 Data source

1. The company's financial data on Firm Value, Tangibility, and Profitability were taken from the company's annual report through the website www.idx.co.id and each company's website.
2. The macroeconomic data on GDP Growth Rate was taken from the Ministry of Trade's website www.satudata.kemendag.go.id.

2.4 Data Analysis

This research uses 2 testing stages, namely:

1. Panel Data Regression

The data in this research combines time series data and cross section data, panel data regression is required. The analytical tool used is Eviews version 10. The panel data regression equation is as follows: [69].

$$LEV_{it} = \alpha_{01} + \beta_1 GDP_{it} + \beta_2 TANG_{it} + \beta_3 PROF_{it} + \varepsilon_t$$

$$FV_{it} = \alpha_{02} + \beta_1 GDP_{it} + \beta_2 TANG_{it} + \beta_3 PROF_{it} + \varepsilon_t$$

$$FV_{it} = \alpha_{02} + \beta_1 GDP_{it} + \beta_2 TANG_{it} + \beta_3 PROF_{it} + \beta_4 LEV_{it} + \varepsilon_t$$

In conducting panel data regression analysis, there are three model approaches that can be selected, namely pooled least square, fixed effect model, and random effect model [70]. To determine the model that best suits the data, a series of tests are carried out, including the Chow Test, Hausman Test, and Lagrange Multiplier Test [71]. The Chow test is used to choose between the pooled least square model or the more appropriate fixed effect model. The Hausman test is conducted to choose between a

fixed effect model or a random effect model that is more appropriate. Meanwhile, the Lagrange Multiplier Test is used to determine whether the random effect model is better than the pooled least square model.

2. Path Analysis

Path analysis is a method used to investigate the role of intermediate (intervening) variables in explaining the relationship between predictor (independent) variables and response (dependent) variables. This method allows researchers to quantify the direct effect of independent variables on the dependent variable, as well as estimate the indirect effect mediated by intervening variables [72]. In the context of this study, the Sobel test was applied to evaluate the magnitude of the indirect effect of the independent variable on the dependent variable through the mediator variable [73]. Within the framework of this research endeavor, the Sobel testing procedure was employed to quantify the extent of the indirect influence exerted by the explanatory variable upon the outcome variable, an influence facilitated through the intermediary role of the mediator variable [57]:

$$Z_{value} = a.b \sqrt{(b^2.Sa^2 + a^2.Sb^2)}$$

Decision Criteria:

- a. If Z calculated < Z table, then the hypothesis is rejected.
- b. If Z calculated > Z table, then the hypothesis is accepted.

3. RESULTS AND DISCUSSION

3.1 Descriptive Statistics

The following descriptive statistical results of the research variables are described through the average value, minimum value, maximum value, and standard deviation.

Table 3. Descriptive statistics

Variables	Mean	Maximum	Minimum	Standard Deviation
GDP	2.588	4.640	-2.890	2.797
Tangibility	.582	1.110	.173	.178
Profitability	.261	3.198	-1.467	.402
Leverage	.294	3.117	.193	.283
Tobins Q	1.548	9.500	.530	1.230

Source: Output Eviews version 10

The average value of GDP is 2,588 with a maximum value of 4,640 which occurred in 2022 where at that time the covid-19 pandemic ended, while the minimum value of GDP was -2,890 which occurred in 2020 where at that time the covid-19 pandemic was hitting countries in the world.. The GDP standard deviation value is 2,797 which is close to the average value but higher which shows that the data spread is quite far due to abnormal data that occurred in 2020.

Tangibility as measured by the ratio of fixed assets to total assets shows an average value of 0.582, a maximum value of 1.110 which occurs in the Astra Agro Lestari tbk company engaged in agriculture, a minimum value of 0.173 which occurs in the H.M.Sampoerna tbk company (year 2022). The standard deviation value of the Tangibility variable is below its average value, which indicates that the data distribution is not too far different.

The Profitability (ROA) variable shows an average value of 0.261, which means that the ability to generate profits in companies listed on the compass 100 index is quite good. The maximum value of 3,198 and the minimum of -1,467 are both in the Matahari Department Store company. The standard deviation value of 0.402 above the average value indicates data that spreads far enough. The leverage variable in this case is measured by comparing interest bearing debt with total assets showing an average value

of 0.294. The maximum value of 3,117 occurs in the company Sumarecon Agung Tbk, a company engaged in the property sector, while the minimum value occurs in the Mitra Keluarga Karyasehat company engaged in the health sector. The standard deviation value shows a number below the average value, which means that the data distribution is not too far away.

The company value as measured by Tobins-Q has an average value of 1.548, which means that these companies get enough trust from investors, the maximum value is 9.500 which occurs in the H.M. Sampoerna company, which is a company engaged in consumer goods, the minimum value is 0.530 at PT Telkom Indonesia tbk. The standard deviation value is below the average value, which means that the data distribution is not too far away.

3.2 Regression Analysis

This study uses multiple linear regression analysis and path analysis and Sobel Test. Path analysis was developed as a method to study influence (effect) directly and indirectly from the independent variable to the dependent variable to the dependent variable [74].

Before conducting hypothesis testing, first select a panel data regression model by conducting the Chow test, Hausman test, and Lagrange Multiplier test until you get the right model. The test results can be seen in the table below:

Table 4. Chow test (Fixed Effects Test)

Effect Test	Statistic	d.f.
Cross-section F	6.549630	(49,196)
Cross-section Chi-square	242.448870	49

Source: Output Eviews version 10

Table 5. Hausman test (Random Effects Test)

Test Summary	Chi-Sq. Stat.	Chi-Sq. d.f.	Prob.
Cross-section random	18.977461	4	0.0008

Source: Output Eviews version 10

Table 6. Regression analysis result

Variable	Model 1		Model 2		Model 3	
	Coeff.	Sig.	Coeff.	Sig.	Coeff.	Sig.
C	0.0922	0.4444	2.4663	0.0000	2.4361	0.0000
GDP	0.0050	0.3186	-0.0041	0.7883	-0.0067	0.8043
Tangibility	0.4015	0.0379	-1.6900	0.0026	-1.3830	0.0016
Profitability	-0.3865	0.0194	0.2882	0.0555	0.5259	0.0055
Leverage	-	-	-	-	-0.6900	0.0119

Source: Output Eviews version 10

The Chow test yielded a probability value of 0.000, which is lower than the 0.05 threshold, leading to the conclusion that the Fixed Effect model is more suitable than the Common Effect model for this analysis. Furthermore, the Hausman test results, with a probability value of 0.0008, also below 0.05, corroborate that the Fixed Effects Model is the appropriate choice. Consequently, the empirical examination conducted in this study employed the Fixed Effects modeling approach.

The initial hypothesis investigating the impact of Gross Domestic Product (GDP) on the capital structure was refuted, as the obtained significance value of 0.3186 exceeded the threshold of 0.05. This result implies that GDP does not exert a statistically significant influence on the capital structure of the firms examined. However, the positive relationship observed between GDP and capital structure is consistent with the findings reported by Ater et al. [75] in their study.

The second hypothesis in this study looks at the effect of Tangibility on capital structure which produces a Sig. 0.0379 <0.05 which means it has a significant influence. This is in line with previous studies such as these references [12,65,76].

The third hypothesis that examines the relationship between Profitability as measured by ROA and capital structure shows a Sig value. 0.0194 <0.05 which means it has a significant relationship. The negative coefficient indicates a negative relationship between profitability and capital structure. This result is in line with the research conducted by Chang [6,54].

The fourth hypothesis shows that the relationship between GDP and firm value has an insignificant negative relationship, so the fourth hypothesis in this study is rejected, because the value of Sig. 0.7883 > 0.05, it can be concluded that GDP has no significant effect on firm value. This can

happen because GDP only measures the overall economic activity of a country, not the performance of individual companies. So even if GDP increases, it does not necessarily have a direct effect on the value of a company. This result is in line with previous research which states that GDP has no significant effect on firm value [77].

The fifth hypothesis tests the effect of Tangibility on firm value which shows a Sig value. 0.0026 <0.05 and a negative coefficient value which means that Tangibility has a negative and significant relationship to firm value. These results are in line with research conducted by Khan and Siddiqua [52].

The sixth hypothesis looks at the effect of Profitability on firm value which produces a Sig value 0.0555 > 0.05 and the coefficient is positive, which means that profitability has a positive but insignificant relationship.

The seventh hypothesis shows a negative and significant relationship between capital structure and firm value, because it has a Sig. 0.0119 <0.05 and negative coefficient value. This is in line with several previous studies such as [70,78].

3.2.1 Path analysis and sobel test

Path analysis using Sobel calculations to determine the direct effect and indirect effect of GDP, Tangibility, and Profitability variables on Firm Value through the mediating variable Capital Structure in large companies in Indonesia.

The eighth hypothesis to test the effect of GDP on Firm Value through Capital Structure variable shows the result of p value 0.1761 which means that Capital Structure cannot mediate the relationship between GDP and Firm Value. Capital structure as a mediating variable does not significantly influence the relationship between GDP and Firm Value.

Table 7. Sobel test result

Variable	X → CS		CS → FV		Z Value	p-value
	Coeff. A	Standard Error A	Coeff. B	Standard ErrorB		
GDP	0.0050	0.0050	-0.6890	0.2718	-0.9302	0.1761
Tangibility	0.4015	0.1921	-0.6890	0.2718	-1.6126	0.0584
Profitability	-0.3865	0.1639	-0.6890	0.2718	1.7263	0.0421

Where: X: Independent Variables (GDP, Tangibility, Profitability); CS: Capital Structure (Mediating Variable); FV: Firm Value (Tobins-Q).

Source: Output Eviews version 10

The ninth hypothesis shows the test results of the capital structure mediation variable on the relationship between Tangibility and Firm Value. The p-value result is $0.0584 > 0.05$ (5%) which means that capital structure cannot mediate the relationship between Tangibility and Firm Value at the 5% significance level, but can mediate at the 10% significance level ($0.0584 < 0.10$).

The tenth hypothesis examines the effect of Profitability on Firm Value through the mediating variable of capital structure. From the p-value result, it is known that capital structure variable can mediate the relationship between Profitability and Firm Value ($0.0421 < 0.05$).

4. CONCLUSION

The analysis results show that a country's Gross Domestic Product (GDP), which measures the overall economic performance, does not significantly impact a company's capital structure (how it finances its operations) and firm value (its worth). This could be because GDP only reflects the broader economic conditions, while a company's financing decisions and performance evaluation are more heavily influenced by its internal factors.

On the other hand, firm characteristics represented by tangibility and profitability variables are proven to have a significant effect on capital structure. Tangibility has a positive and significant effect on capital structure. The higher the tangibility, the greater the debt ratio in the capital structure. Tangible assets can be used as debt collateral, so the greater the tangible assets, the greater the company's ability to increase debt or get loans. So it can be said that the more resilient the company is based on its tangible assets, the greater its capacity and ability to invite capital from debt. Profitability has a negative and significant effect on capital structure. The higher the profitability, the smaller the debt in capital structure. This result supports the Pecking Order Theory that prioritizes the use of internal funds in financing the company's operations.

Tangibility also has a negative effect on firm value, which means that the greater the proportion of tangible assets, the lower the company's market value. The capital structure itself is proven to correlate negatively with firm value. Nevertheless, the influence of firm characteristics on firm value in general is not mediated by capital structure. Only the influence

of profitability is proven to be mediated by capital structure in its relationship with firm value. Overall the results of this study are in line with most previous empirical studies on the same topic.

In other words, macro economic factors such as GDP have less of a role in explaining capital structure and a company's value. Instead, the internal characteristics of the company itself individually in fact have a huge impact on determining the optimal capital structure and value creation for the company.

For further research, it is recommended to use other macroeconomic proxies besides GDP such as more sensitive interest rates and inflation, expanding the sample to not only large companies but also SMEs, adding relevant control variables, lengthening the observation period, as well as utilizing more advanced analytical methods such as structural path analysis. Thus, it is hoped that the research results will be more comprehensive in demonstrating the influence of macroeconomic conditions on capital structure and firm value, thereby providing stronger empirical evidence.

CONSENT

written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ACKNOWLEDGEMENTS

The author express their deepest gratitude to the faculty members who provided invaluable assistance in the writing of this article, thereby enhancing its quality to a higher standard. Their guidance and feedback proved instrumental in refining this work, ultimately resulting in a more robust and comprehensive scholarly research piece.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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