

Investment Opportunity Set, Free Cash Flow, and Capital Structure as Determinants of Technology Firm Value

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Abstract. The significant decline in Indonesia's technology sector during 2022–2024 reflects a tech winter phenomenon that reduces investor confidence in management effectiveness in creating firm value. This study aimed to examine the effect of Investment Opportunity Set (IOS), Free Cash Flow (FCF), and Capital Structure on firm value in technology sector companies listed on the Indonesia Stock Exchange. This study employed a quantitative approach using secondary data with 80 observations from 28 companies selected through purposive sampling. Data analysis was conducted using panel data regression with the Fixed Effect Model (FEM) through EViews 12. The findings reveal that IOS has a positive and significant effect on firm value. In contrast, FCF has a negative and significant effect, while Capital Structure proxied by the Debt-to-Equity Ratio (DER) has no significant effect on firm value. These findings indicate that investment opportunities remain an important determinant of firm value, whereas high free cash flow is not necessarily perceived positively by investors when it is not utilized to support future growth opportunities.

Keywords Capital Structure; Firm Value; Free Cash Flow; Investment Opportunity Set; Technology Sector

1 Introduction

Every company fundamentally aims to create and enhance value for its stakeholders. Building firm value constitutes the primary objective of business activities, as it reflects the effectiveness of resource management and determines the company's competitive positioning in the market [1]. The level of firm value is of particular concern not only to shareholders but also to other parties including employees, customers, and creditors who utilize such information in making economic decisions. Moreover, an increase in firm value signals the optimal management of assets by the company's leadership in generating profits, which in turn contributes to the growing prosperity of its owners. Consequently, companies must not

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merely focus on short-term profitability, but must also prioritize the sustainable creation of long-term value.

Firm value reflects a company's long-term achievements and the degree of public confidence in its ability to utilize resources effectively in advancing shareholder wealth. This value is generally represented by the stock price, which mirrors investors' assessments of the company's performance and business prospects. Consistent with this view, Yuliandhari & Nurramadhani [2] affirm that firm value reflects the level of investor confidence in management's capacity to generate profits and to communicate positive signals through financial performance. Accordingly, stock price fluctuations serve as a critical benchmark for evaluating the stability and growth of firm value.

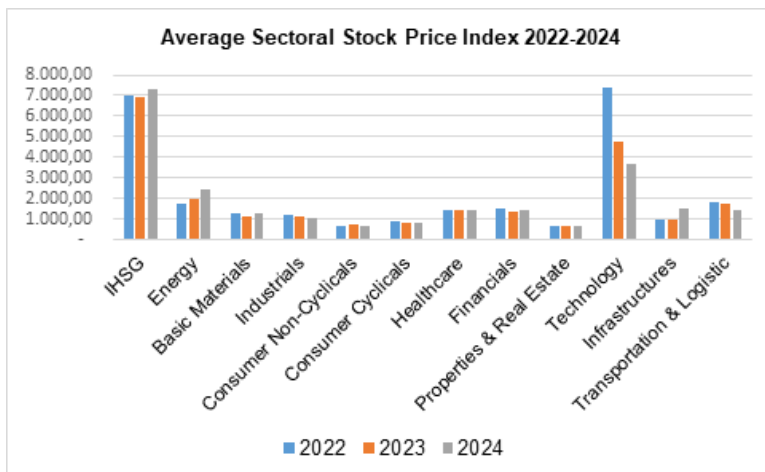


Figure 1 Average Sectoral Stock Price Index Movement for the 2022–2024 Period
Source: IDX, Processed Data (2026)

Figure 1 illustrates the volatile movement of stock prices in the Indonesian capital market throughout the 2022–2024 period. Referring to data from the Indonesia Stock Exchange (IDX), the Composite Stock Price Index (IHSG) recorded a moderate increase from IDR 7,006.80 in 2022 to IDR 7,275.33 in 2024, despite a temporary decline to IDR 6,885.75 in 2023. However, this positive trend was not uniformly experienced across all sectors. The technology sector, in particular, recorded a significant decline — despite maintaining the highest average stock prices relative to other sectors, its values fell continuously from IDR 7,410.00 in 2022 to IDR 4,765.46 in 2023 and further weakened to IDR 3,652.42 in 2024. This condition indicates a shift in market dynamics, reflecting a change in investor sentiment toward the performance and prospects of technology companies during the period.

Rapid technological advancement has increasingly positioned the technology sector as one of the most attractive sectors in the capital market due to its substantial growth potential. The technology sector, which encompasses hardware and software development, digital services, e-commerce, fintech, and cloud-based solutions, continues to attract considerable attention from investors. Nevertheless, despite its strong growth prospects, the sector remains highly volatile. The technology stock index surged significantly in 2021 due to increased digital demand during the pandemic but subsequently experienced consecutive declines of 42.6% in 2022, 14.1% in 2023, and 24.3% in April 2024 [3]. This condition was partly driven by the weakening performance of several major issuers in the sector, such as PT Bukalapak.com Tbk (BUKA), PT Elang Mahkota Teknologi Tbk (EMTK), and PT GoTo Gojek Tokopedia Tbk (GOTO), all of which experienced declining stock prices throughout 2024.

The decline in the performance of the technology sector reflects a phenomenon commonly referred to as the Tech Winter, a period in which investor interest in the technology industry declines due to global economic pressures and high inflation [3]. Under these circumstances, many companies fail to meet growth targets, resulting in difficulties in securing funding and declining valuations. Consequently, these conditions have placed downward pressure on the value of technology companies, as reflected in declining stock prices and weakening investor optimism regarding the sector's long-term prospects. Market instability has also made investors more sensitive to companies' fundamental information when assessing investment risks and opportunities.

The decline in average stock prices within the technology sector can be interpreted as a signal of weakening market perception regarding companies' capacity to generate value for their shareholders. This condition underscores the importance of maintaining firm value stability, particularly in order to sustain investor interest amid intensifying competitive pressures and market uncertainty. Drawing on signalling theory, companies can transmit positive signals through a promising Investment Opportunity Set (IOS) that signals growth potential, Free Cash Flow (FCF) that reflects financial soundness, and an optimal capital structure, all of which collectively strengthen investor confidence in the company's long-term prospects.

Changes in firm value cannot be separated from several influencing factors. One of these factors is the Investment Opportunity Set (IOS), which represents the company's investment opportunities and reflects firm value through its future growth prospects [4]. An increase in IOS indicates expansion opportunities and the company's capability to develop its investment activities, thereby serving as a positive indicator for investors regarding potential future returns [5]. Several previous studies have demonstrated that IOS plays a role in influencing firm value [6], [7]. However, other findings suggest that IOS does not significantly contribute to firm value because investment outcomes are not always optimal and some investors tend to focus more on short-term gains [8]. These inconsistent findings indicate that the relationship between IOS and firm value still requires further investigation.

Another factor influencing firm value is Free Cash Flow (FCF). FCF refers to the cash available after fulfilling the company's operational needs and long-term investment requirements, which can subsequently be distributed to shareholders and creditors [9]. The presence of FCF serves as an important indicator for investors, as it reflects the company's ability to meet its obligations, support investment activities, and maintain financial stability. Empirical studies examining the role of FCF in influencing firm value have yielded mixed findings. Some studies confirm that FCF significantly affects firm value [10], while others argue that FCF does not exert a significant influence, as a company's cash management does not necessarily translate into improved market valuation [4], [11]. This inconsistency highlights a persistent research gap regarding the relationship between FCF and firm value.

A further aspect linked to firm value is capital structure, which describes the composition of debt and equity employed as sources of financing for a company's operational activities [5]. Trade-off theory suggests that the use of debt has the potential to enhance firm value through tax benefits, provided that such debt remains within an optimal threshold. Additionally, the use of debt can be interpreted as a positive signal regarding the company's future growth capacity. Several studies indicate that capital structure can influence changes in firm value [6]. However, other research finds that capital structure does not produce a significant effect, as variations in debt and equity financing are regarded as a common feature of business operations [12]. The inconsistency of these findings indicates that the relationship between capital structure and firm value remains an unresolved area requiring further examination.

Based on the existing phenomenon and the inconsistencies in previous research findings, this study is conducted to address these research gaps. This study focuses on empirically

examining the roles of IOS, FCF, and capital structure in determining firm value among technology sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period. Furthermore, this study is expected to provide practical benefits for companies, particularly in enhancing firm value through the optimization of investment opportunities, effective cash flow management, and efficient capital structure decisions that support financial performance and business sustainability. In addition, the findings are expected to provide strategic insights for management in responding to market pressures and the continuously evolving dynamics of the technology industry.

2 Literature Review & Hypothesis Development

2.1 Literature Review

2.1.1 *Signalling Theory*

Signalling theory, introduced by Michael Spence (1973), explains that companies convey signals to recipients (investors) regarding their business conditions and performance through financial reports, which serve as a basis for investment decision-making. Brigham and Houston (2019) further state that signals represent a form of communication from management to investors concerning the company's condition and future prospects. The accuracy, relevance, and timeliness of information may create positive perceptions and subsequently enhance investor confidence. Conversely, irrelevant or delayed information may generate negative signals in the market. Investors generally respond more positively to companies that demonstrate strong performance accompanied by healthy growth potential, which ultimately contributes to an increase in firm value [13].

2.1.2 *Trade-Off Theory*

Trade-off theory suggests that companies tend to determine an optimal capital structure by balancing the benefits and risks associated with the use of debt financing. The utilization of debt provides advantages in the form of tax savings or tax shields; however, it may also increase financial risk. From the perspective of this theory, the use of debt has the potential to increase firm value as long as it does not exceed the optimal level. Nevertheless, excessive debt usage may generate financial distress risks that negatively affect firm value [5]. Therefore, companies must adjust the proportion of debt financing to ensure that the benefits obtained remain greater than the associated costs.

2.1.3 *Firm Value*

Firm value reflects a company's success as indicated by investor confidence and the company's market value [2]. Firm value also represents the amount of value that could be obtained if the company were sold while continuing its operations. Within the capital market mechanism, firm value may be reflected in stock prices, which represent management's ability to manage assets and maximize shareholder wealth. Accordingly, a high firm value indicates financial stability as well as managerial effectiveness in carrying out corporate functions and responsibilities [2].

2.1.4 *Investment Opportunity Set*

The concept of the Investment Opportunity Set (IOS), introduced by Myers (1977), refers to the company's opportunities to achieve long-term growth through various investment alternatives capable of creating additional value for the firm [4]. IOS encompasses all investment opportunities owned by the company, including those already realized in the form of existing assets as well as those with potential future development [9]. IOS reflects how future investment decisions fundamentally influence firm value, where each

available opportunity generates a certain Net Present Value (NPV) that serves as a signal to investors [6].

2.1.5 Free Cash Flow

Free Cash Flow (FCF) was first introduced by Jensen (1986) as the remaining cash after deducting investment expenditures for projects with positive net present value. Lehn and Poulsen (1989) define FCF as net operating income after adjustments for depreciation, taxes, interest expenses, and dividends [14]. The existence of FCF serves as an important indicator in measuring a company's performance and capacity to generate additional value for shareholders, whether through dividend payments, debt repayment, or share buybacks. Companies with high FCF are generally perceived more positively by investors because they indicate strong investment opportunities and sound financial conditions, which may ultimately influence firm value [4].

2.1.6 Capital Structure

Capital structure refers to the combination of liabilities and equity employed by a company to finance its operational and investment activities [2]. Capital structure is considered an important aspect because it is closely related to financing decisions that may influence risk, return, and firm value. In trade-off theory, capital structure is viewed as the result of balancing debt financing and equity financing in order to achieve optimal benefits in the form of increased firm value while considering tax shield advantages and the risks associated with debt usage. Therefore, companies need to manage an efficient capital structure in order to minimize capital costs while maximizing shareholder wealth.

2.2 Hypothesis Development

From the perspective of signalling theory, the presence of a company's investment opportunities can serve as a positive indicator for investors regarding the firm's expansion prospects in future periods. A high Investment Opportunity Set (IOS) reflects strong growth potential and the likelihood of improved company performance, both of which may increase firm value in the eyes of investors. Findings from several prior studies confirm that IOS exerts a positive and significant effect on firm value [5], [6]. This indicates that investment decisions and growth opportunities are taken into consideration by investors when evaluating a company. Therefore, companies with higher investment opportunities are expected to have higher firm value. On this basis, the following hypothesis is proposed:

H1: Investment Opportunity Set (IOS) has a positive effect on firm value.

From the perspective of signalling theory, a high level of Free Cash Flow (FCF) represents the company's financial strength in generating cash and maintaining sound financial management, which is perceived positively by investors. A substantial FCF indicates the company's flexibility in meeting its obligations, funding investment activities, and delivering benefits to shareholders, all of which may increase firm value [10]. Furthermore, a high FCF also reflects the company's capacity to repay debt and manage financial risks in the future, thereby reinforcing investor confidence in the firm [11]. Previous studies provide empirical evidence that FCF positively contributes to firm value [10]. Accordingly, companies with higher free cash flow are expected to have higher firm value. Therefore, the following hypothesis is proposed:

H2: Free Cash Flow (FCF) has a positive effect on firm value.

Based on trade-off theory, capital structure relates to the company's decision in determining the optimal combination of debt and equity to support operational activities and enhance firm value. Appropriate use of debt may provide benefits in the form of tax shields

while simultaneously supporting business expansion, thereby influencing firm value [15]. In addition, the utilization of debt for business development and asset expansion may provide positive signals to investors regarding the company's future growth potential [6]. Previous studies by Rini and Mimba [6] demonstrate that capital structure has a positive and significant effect on firm value. Accordingly, the following hypothesis is proposed:

H3: Capital Structure has a positive effect on firm value.

3 Research Method

3.1 Research Design and Sample Selection

This research is categorized as explanatory research employing a quantitative approach to explain the relationships among the variables examined. The quantitative approach was applied in this study to obtain and process measurable data so that the results could be statistically analyzed. The data utilized in this research consist of quantitative secondary data derived from the financial statements and annual reports of technology sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. These data were collected through the official IDX website (www.idx.co.id) as well as the official websites of each company.

The population in this study consists of technology sector companies listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period. Meanwhile, the sample represents a portion of the population selected to represent the overall research data. The sample selection process employed a purposive sampling method based on specific criteria adjusted to the objectives of the study. The sample selection process in this research is described as follows.

Table 1 Sample Selection Process

Criteria	Total
Technology sector companies listed on the IDX during the 2022–2024 period	47
Technology sector companies delisted during the 2022–2024 period	(4)
Technology sector companies that did not consistently and completely publish financial statements and annual reports during the 2022–2024 period	(6)
Technology sector companies that did not provide complete data for all research variables during the 2022–2024 period	(8)
Technology sector companies that did not present financial statements in Indonesian Rupiah	(1)
Total Sample Companies	28
Total Observation Periods	3
Total Observations for 2022-2024	84
Outlier Data	(4)
Total Observations After Outlier Elimination	80

Source: Processed Data (2026)

3.2 Operationalization and Measurement Variable

The operationalisation and measurement of the variables employed in this study are presented in Table 2. The table provides the operational definitions and measurement formulas used for each research variable.

Table 2 Operational Definition of Variables

Research Variables	Operational Definition	Measurement
Firm Value (Y)	Reflects market perceptions of a company's performance and future growth prospects.	$Tobin's\ Q = \frac{\text{Market Value of Equity} + \text{Total Debt}}{\text{Total Assets}}$ [2]
Investment Opportunity Set (X ₁)	Reflects the company's growth opportunities through the comparison of market value and book value of equity.	$MBVE = \frac{\text{Number of Outstanding Shares} \times \text{Closing Stock Price}}{\text{Total Equity}}$ [6]
Free Cash Flow (X ₂)	Reflects the company's ability to generate cash after financing operational and investment activities.	$FCF = \frac{\text{Operating Free Cash Flow} - \text{Capital Expenditure} - \text{Net Working Capital}}{\text{Total Assets}}$ [15]
Capital Structure (X ₃)	Reflects the proportion of debt relative to equity as a representation of the company's financing policy.	$DER = \frac{\text{Total Debt}}{\text{Total Equity}}$ [15]

Source: Processed Data (2026)

3.3 Analytical methods

The data analysis in this study was conducted using a panel data regression approach, which combines time series observations and cross-sectional units simultaneously in order to generate more accurate estimations in identifying the relationships among the research variables. All stages of data processing were carried out using EViews 12 software. The panel data regression procedures employed in this study include: (1) Descriptive Statistical Analysis, (2) Regression Model Selection Test, (3) Classical Assumption Tests, (4) Panel Data Regression Analysis, and (5) Hypothesis Testing. The regression model employed in this study is formulated as follows:

$$Tobin's\ Q = \alpha + \beta_1 \cdot IOS_{it} + \beta_2 \cdot FCF_{it} + \beta_3 \cdot DER_{it} + e$$

4 Result and Discussion

3.4 Analysis Result

4.1.1 Descriptive Statistical Analysis

Table 3 Descriptive Statistical Analysis Results

Variable	Obs	Maximum	Minimum	Mean	Std. Dev
Tobin's Q	80	3,342	-1,107	0,413	0,941

IOS	80	55,376	0,073	4,103	8, 991
FCF	80	1,083	-1,239	-0,334	0,359
DER	80	25,071	0,025	1,128	3,165

Source: Processed Data (2026)

The results of the descriptive statistical analysis indicate that the total number of observations for all research variables consists of 80 data points. Tobin's Q, which serves as a proxy for firm value, shows a mean value of 0,413, with a maximum value of 3,342 and a minimum value of -1,107. The standard deviation of 0.941 indicates that firm value among the sample companies varies considerably. Investment Opportunity Set (IOS) records an average value of 4,103 with a standard deviation of 8,991, indicating that the level of investment opportunities among the sample companies is relatively diverse and exhibits a high degree of data dispersion. On the other hand, Free Cash Flow (FCF) has a mean value of -0,334, suggesting that the free cash flow condition of the sample companies tends to be relatively low. Meanwhile, the Debt-to-Equity Ratio (DER), used as a proxy for Capital Structure, has a mean value of 1,128 and a standard deviation of 3,165, indicating substantial variation in capital structure among the sample companies.

4.1.2 Regression Model Selection

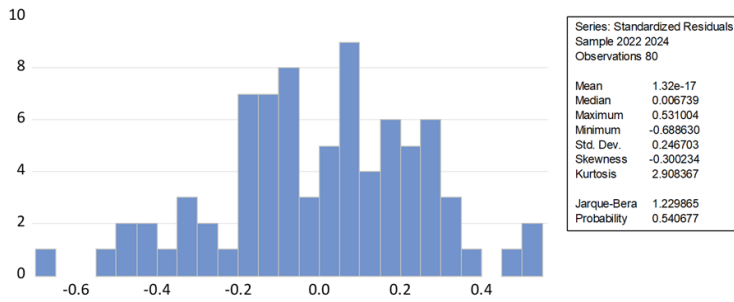
Table 4 Summary of Chow Test and Hausman Test Results

Effect Test	Statistic	d.f	Prob.
Cross-section F	8,351905	(27,49)	0,0000
Cross-section random	7,865377	3	0,0489

Source: Processed Data (2026)

The selection of the most appropriate regression model was conducted using the Chow Test, Hausman Test, and Lagrange Multiplier Test. Based on the Chow Test results, the probability value of the cross-section F statistic is 0.0000, which is lower than the significance level of 0.05, indicating that the Fixed Effect Model (FEM) is the most suitable specification. Consistent results were obtained from the Hausman Test, where the probability value of the cross-section random statistic is $0.0489 < 0.05$ similarly pointed toward the selection of FEM. The convergence of results from both tests confirms that FEM is the most appropriate regression model for this research. Therefore, the Lagrange Multiplier Test was no longer required.

4.1.3 Normality Test

**Figure 2** Normality Test Results

Source: Processed Data (2026)

Figure 2 shows that the Jarque-Bera probability value is 0,540677, which exceeds the established significance level of 0,05. Therefore, the residuals of the regression model can be considered normally distributed after data adjustments were conducted through outlier elimination and transformation of the Tobin's Q data.

4.1.4 Multicollinearity Test

Table 5 Multicollinearity Test Results

	IOS	FCF	DER
IOS	1,000000	0,155462	0,022164
FCF	0,155462	1,000000	0,280838
DER	0,022164	0,280838	1,000000

Source: Processed Data (2026)

Based on the results presented in Table 5, all correlation coefficients among the independent variables are below 0,85. Therefore, the regression model used in this study can be concluded to be free from multicollinearity problems.

4.1.5 Heteroscedasticity Test

Table 6 Heteroscedasticity Test Results

Dependen Variable: ABS(RESID)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0,167799	0,044760	3,748870	0,0005
IOS	-8,678110	0,005122	-0,016944	0,9865
FCF	-0,083623	0,102606	-0,814987	0,4190
DER	0,001450	0,009365	0,154861	0,8776

Source: Processed Data (2026)

Table 6 presents the results of the Glejser test, showing that the probability values of all independent variables exceed the significance level of 0,05. This condition indicates that there is no evidence of heteroscedasticity in the regression model.

4.1.6 Autocorrelation Test

Table 7 Autocorrelation Test Results

Durbin-Watson Upper (dU)	Durbin-Watson Stat (DW)	Durbin-Watson Lower (dL)
1,7153	2,290163	1,5600

Source: Processed Data (2026)

Based on the results presented in Table 7, the Durbin–Watson (DW) value falls within the range of $dU < DW < 4 - dL$ ($1,7153 < 2,2902 < 2,7600$). Therefore, it can be concluded that the regression model does not exhibit autocorrelation problems.

4.1.7 Model Feasibility Test

Table 8 Regression Model Feasibility Test Results (F-Test)

Effect Test	Prob.
F-statistic	22,15413
Prob (F-statistic)	0,000000

Source: Processed Data (2026)

Table 8, which presents the results of the model feasibility test, shows that the probability value of the F-statistic is $0.000000 < \alpha (0,05)$. These findings indicate that, in this study, at least one independent variable is capable of explaining the dependent variable, namely firm value. Therefore, the regression model applied in this research can be considered statistically feasible and appropriate for analysis.

4.1.8 Coefficient of Determination (R^2)

Table 9 Coefficient of Determination (R^2) Test Results

Effect Test	Prob.
R-squared	0,931336
Adjusted R-squared	0,889297

Source: Processed Data (2026)

Referring to Table 9, the Adjusted R-squared value is recorded at 0.889297. This result indicates that 88.93% of the variation in Tobin's Q can be explained by the three independent variables included in this study, namely Investment Opportunity Set (IOS), Free Cash Flow (FCF), and Debt-to-Equity Ratio (DER). Meanwhile, the remaining 11.07% is explained by other variables outside the scope of this research model.

4.1.9 Regression Analysis Results

Table 10 Regression Analysis Results Using the Fixed Effect Model (FEM)

Dependen Variable: LOG(TOBINS_Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0,143249	0,114752	-1,248344	0,2178
IOS	0,061913	0,013130	4,715273	0,0000
FCF	-0,921233	0,263053	-3,502081	0,0010
DER	-0,005127	0,024009	-0,213548	0,8318

Source: Processed Data (2026)

Referring to the panel data regression estimation results, the following regression equation is obtained:

$$\text{Tobin's } Q = -0,143 + 0,062IOS - 0,921FCF - 0,005DER + e$$

4.1.10 Hypothesis Test (t-Test)

Table 11 Summary of Hypothesis Testing Results

Hypothesis	Hypothesis Testing Result	Conclusion
H ₁ = Investment Opportunity Set (IOS) has a positive effect on firm value (Tobin's Q)	Positive (+) and significant effect on firm value	Accepted
H ₂ = Free Cash Flow (FCF) has a positive effect on firm value (Tobin's Q)	Negative (-) and significant effect on firm value	Rejected
H ₃ = Capital Structure (DER) has a positive effect on firm value (Tobin's Q)	Negative (-) and insignificant effect on firm value	Rejected

Source: Processed Data (2026)

Based on the regression output presented in Table 10, the Investment Opportunity Set (IOS) as the first independent variable recorded a probability value of $0.0000 < \alpha (0.05)$ with a positive beta coefficient of 0.061913. These results indicate that an increase in IOS exerts a positive and statistically significant effect on firm value, as proxied by Tobin's Q ratio. Accordingly, the **first hypothesis (H1)**, which posits that IOS has a positive effect on firm value, is **supported**.

Furthermore, the Free Cash Flow (FCF) variable recorded a probability value of 0.0010 with a negative beta coefficient of -0.921233 . Given that the probability value is less than the significance level of 0.05, this finding indicates that FCF has a significant negative effect on firm value. Since the direction of the relationship is contrary to the proposed hypothesis, the **second hypothesis (H2)**, which posits that FCF has a positive effect on firm value, is **not supported**.

Meanwhile, the Debt to Equity Ratio (DER), employed as the measurement ratio for the capital structure variable, yielded a beta coefficient of -0.005127 with a probability value of 0.8318, which exceeds the significance threshold of 0.05. This finding indicates that DER does not exert a significant effect on firm value. Therefore, the **third hypothesis (H3)**, which posits that capital structure has a positive effect on firm value, is **not supported**.

3.5 Discussion of Research Findings

The Effect of Investment Opportunity Set on Firm Value

Based on the hypothesis testing results, the Investment Opportunity Set (IOS), proxied by the Market to Book Value of Equity (MBVE), is proven to have a positive and significant effect on firm value measured by Tobin's Q. These findings indicate that an increase in the company's investment opportunities tends to receive a positive response from the market, thereby encouraging an increase in firm value. This condition suggests that investors perceive companies with favorable investment prospects as entities possessing strong expansion potential in the future. In the technology industry, which is characterized by continuous innovation and relatively rapid product life cycles, the availability of broad investment opportunities is perceived by investors as a positive signal regarding the company's ability to maintain competitive performance and ensure business sustainability in the future.

The positive effect of IOS is particularly relevant in the context of the technology sector during the 2022–2024 tech winter period. During this period, declining investor confidence led market participants to become more selective in assessing technology firms. Under such circumstances, companies that continued to demonstrate strong growth opportunities were more likely to attract investor attention. Therefore, a high IOS served as a positive signal regarding the company's ability to sustain innovation, expand its business, and generate future returns despite unfavorable market conditions.

These findings are consistent with signalling theory, which suggests that investment opportunities provide information regarding future company prospects. The findings also align with the characteristics of growth firms, whose market value is strongly influenced by expectations of future growth rather than current earnings alone. Therefore, investors appear to reward technology firms that maintain attractive investment opportunities even during periods of market uncertainty. This finding is in line with Rini and Mimba [6], which found that IOS positively contributes to firm value. Alamsyah et al. [7] also demonstrated that an increase in IOS signals promising growth potential, thereby strengthening investor interest and ultimately increasing firm value.

The Effect of Free Cash Flow on Firm Value

Referring to the hypothesis testing results, Free Cash Flow (FCF), proxied by the ratio of FCF to total assets, is proven to have a significant negative relationship with Tobin's Q. Within the perspective of signalling theory, FCF may serve as a signal regarding the company's capacity to generate cash from operational activities. However, a high level of FCF is not always positively perceived when the company lacks a clear investment direction. In the technology industry during the 2022–2024 period, the tech winter condition caused investors to become more selective in evaluating corporate prospects. Under such circumstances, large amounts of FCF may be interpreted as an indication of funds that have not been optimally utilized or as evidence of limited investment opportunities, thereby reducing market confidence and leading to a decline in firm value.

The negative relationship between FCF and firm value may also be explained by the characteristics of technology companies, which are generally categorized as growth firms. Unlike mature firms that tend to focus on maintaining stable cash flows and distributing dividends, technology companies generally allocate substantial resources to innovation, research and development, digital infrastructure, and business expansion. This condition is reflected in the descriptive statistics, which show that the average FCF of the sample companies is negative. Therefore, negative FCF does not necessarily indicate poor performance, but may instead reflect the company's efforts to finance future growth. Conversely, relatively high levels of FCF may be perceived as an indication that the company has fewer profitable investment opportunities, particularly during the tech winter period when investors place greater emphasis on sustainable growth prospects.

These findings are supported by the studies of Dewi and Erawati [15] and Lai et al. [14], who found that FCF has a negative effect on firm value. Dewi and Erawati [15] argue that high free cash flow may increase conflicts of interest regarding the allocation of available funds and raise the risk of unproductive idle cash. Furthermore, the findings are consistent with the characteristics of growth firms, which are valued more highly when they allocate resources toward productive investment opportunities rather than retaining excessive cash reserves. Therefore, investors in the technology sector tend to place greater emphasis on the effectiveness of cash utilization in supporting future growth than on the amount of cash held by the company..

The Effect of Capital Structure on Firm Value

The findings regarding the role of capital structure, measured using the Debt-to-Equity Ratio (DER), on the dependent variable Tobin's Q reveal that DER has a negative but insignificant relationship with firm value. These findings indicate that changes in DER do not provide a meaningful contribution to changes in firm value. According to trade-off theory, companies seek to establish the most efficient capital structure by balancing the tax benefits of debt financing (tax shields) against potential consequences such as bankruptcy risk and agency costs arising from additional debt [5]. Nevertheless, the empirical findings of this study indicate that variations in the combination of debt and equity financing among technology companies do not significantly contribute to the formation of firm value.

This condition may be explained by the unique characteristics of technology companies, whose value creation depends more heavily on intangible assets, innovation capabilities, and future growth potential than on financing structure decisions. During the tech winter period, investors tended to focus more on business sustainability, profitability prospects, and growth opportunities rather than on the proportion of debt and equity used by companies. Consequently, capital structure was not considered a primary factor in determining firm value within the technology sector.

This condition suggests that investors do not yet consider capital structure as a primary benchmark in evaluating corporate prospects. These findings are consistent with the view of Marlina and Yanti [11], who state that although the use of debt may reduce equity agency costs, it also creates consequences in the form of interest payment obligations and potential conflicts between shareholders and creditors (agency cost of debt). Similar results were also found by Zahra et al. [12], where changes in capital structure were not proven to significantly affect firm value because variations in the use of debt and equity do not necessarily influence investor perceptions in assessing companies.

5 Conclusion

This study aims to examine the effects of Investment Opportunity Set (IOS), Free Cash Flow (FCF), and Capital Structure (DER) on firm value proxied by Tobin's Q in technology sector companies listed on the Indonesia Stock Exchange during the 2022–2024 period. The findings reveal that IOS affects firm value, indicating that investment opportunities remain an important consideration for investors in valuing technology companies. In contrast, FCF also affects firm value, but the relationship is negative, suggesting that high free cash flow is not always perceived positively by the market. In the context of technology companies, investors tend to place greater emphasis on the effectiveness of cash utilization in supporting future growth rather than on the amount of cash held by the company. Meanwhile, Capital Structure (DER) does not affect firm value, indicating that financing decisions are not the primary factor considered by investors when evaluating technology firms during the observation period.

These findings suggest that during periods of market uncertainty such as the tech winter, investors tend to focus more on growth opportunities and the efficient allocation of corporate resources than on financing structure. Therefore, technology companies are encouraged to optimize investment opportunities and ensure that available resources are allocated to productive activities that support long-term growth. For future research, it is recommended to incorporate additional variables that may influence firm value and to extend the observation period in order to provide a more comprehensive understanding of the determinants of firm value in the technology sector.

6 References

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