



Business Risk, Firm Size, And Debt Policy On Firm Value: The Mediating Role Of Financial Performance

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ABSTRACT

This study aims to examine the effect of Business Risk (RISK), Firm Size (SIZE), and Debt Policy (DER) on Firm Value (PBV) with Financial Performance (ROA) as a mediating variable in non-financial companies listed on the Indonesia Stock Exchange. The study population includes all companies in the non-financial sector listed on the Indonesia Stock Exchange, and the sample selection was carried out using purposive sampling with criteria of financial reporting consistency, full availability of variable data, and continuous recording during the observation period 2020-2024. This study uses secondary data in the form of annual financial statements obtained from the official website of the Indonesia Stock Exchange and is analyzed using path analysis with the Baron and Kenny procedure through SPSS version 26 software. The results show that RISK has a negative and significant effect on ROA, SIZE has a positive and significant effect on ROA as the most dominant determinant, and DER has a negative and significant effect on ROA. ROA has a positive and significant effect on PBV. Mediation testing proves that ROA significantly mediates the effect of all three independent variables on PBV through partial mediation. This study provides theoretical implications in strengthening the trade-off theory and signaling theory, managerial implications regarding the importance of optimally managing asset scale and leverage, and regulatory implications regarding the need for increased transparency in the disclosure of financial risks by public non-financial companies in the Indonesian capital market.

INTRODUCTION

PBV reflects the market's perception of historical performance, future prospects, and management's ability to sustainably generate shareholder wealth (Meira & Dodik, 2024). As a primary indicator of shareholder financial well-being, PBV also serves as a benchmark for a company's success in optimizing resources and maximizing long-term returns. In an increasingly competitive business environment, enhancing PBV has become a strategic imperative for companies seeking to maintain investor trust and strengthen their position in the capital market (Hamidah & Ramdani, 2023). Firm value can be measured using PBV, which compares the share price to book value per share, where a PBV ratio greater than one indicates that the market values the company positively above its book value (Subramanyam & Wild, 2010). Empirical data

on non-financial companies listed on the Indonesia Stock Exchange show significant fluctuations in PBV, indicating that internal factors such as RISK, SIZE, and DER have not been optimally managed to maintain stable market valuation (Suwardika & Mustanda, 2017).

Three internal variables consistently examined as determinants of PBV in the financial management literature are RISK, SIZE, and DER. RISK reflects uncertainty regarding projections of future asset returns due to the operational and financing choices made by the company (Brigham & Houston, 2013). Firms facing high RISK are likely to experience a decline in value in the eyes of investors due to increased potential for financial distress, making effective risk management a vital prerequisite for maintaining PBV (Firdaus et al., 2024). SIZE reflects the scale of operations and asset capacity of the company, with larger companies generally being viewed as more stable, better able to generate profits, and more trusted by creditors compared to smaller firms (Suwardika & Mustanda, 2017). DER is a financing decision that determines the proportion of debt in a company's capital structure and directly influences the cost of capital, bankruptcy risk, and PBV in the market (Mulianti, 2010). These three variables interact in shaping investor perceptions, so understanding the patterns of relationships among them forms an important foundation for effective financial decision-making.

A company's ROA occupies a central position in linking these three variables to PBV. ROA reflects a company's efficiency in using assets to generate profits and meet obligations, thus directly affecting investors' assessments of the company's prospects (Firdaus et al., 2024). Companies that can maintain good ROA despite RISK and high debt burdens will gain stronger market trust, which is ultimately reflected in higher PBV (Hirdinis, 2019). Trade-off theory explains that companies must balance the tax benefits of debt use with the bankruptcy costs it incurs, while signaling theory asserts that DER and ROA send signals to the market about the company's condition and prospects (Frank & Sanati, 2021). Thus, ROA serves as a transmission mechanism that explains how RISK, SIZE, and DER indirectly shape PBV.

A number of empirical studies have examined the relationships among these variables; however, the results are inconsistent. Sudiyatno et al. (2020) and Nianty et al. (2023) found that RISK has a positive effect on PBV, while Suffah and Riduwan (2016) as well as Fosu et al. (2016) found that SIZE has a positive effect on PBV, whereas Prasetyo (2022) actually found a negative effect. Manoppo and Arie (2016) and Nianty et al. (2023) found that DER has a positive and significant effect on PBV, while Rehman (2016) demonstrated a negative and significant effect. Firdaus et al. (2024), in a study on the Indonesian non finance sector, confirmed that ROA has a positive effect on PBV, while risk as proxied by the Debt to Equity Ratio has a negative effect. These inconsistent findings indicate that the relationship between RISK, SIZE, and DER with PBV is not purely direct, but rather mediated by intermediate variables that have not been adequately identified in a single integrated structural model (Fosu et al., 2016).

The empirical gap lies in the absence of studies that explicitly position ROA as a mediating variable in the relationship between RISK, SIZE, and DER with PBV among non-financial companies listed on the Indonesia Stock Exchange. The non-financial sector is chosen as the context of the study because this sector is characterized by high capital intensity, heavy reliance on debt financing, and strong sensitivity to interest rate changes and macroeconomic conditions. As a result, the interaction among RISK, SIZE, DER, and ROA is highly tangible and measurable (Suwardika & Mustanda, 2017). The observation period of 2020-2024 encompasses Indonesia's economic dynamics that are relevant for testing the stability of relationships among variables under fluctuating market conditions. Based on these conditions, this study examines the effect of RISK, SIZE, and DER on PBV with ROA as a mediating variable in publicly listed companies on the Indonesia Stock Exchange for the period 2020-2024.

This study contributes in three aspects. Theoretically, it strengthens trade-off theory and signaling theory in explaining the mediating mechanism of ROA in the relationship between funding policy, risk, and SIZE with PBV in emerging markets. Empirically, the study provides evidence from the non-financial sector companies on the Indonesia Stock Exchange regarding

the indirect transmission path of these three variables to PBV via ROA in a single integrated structural model. Practically, the findings of this study offer guidance for company management and investors in designing financial policies that measurably enhance PBV through the sustainable optimization of ROA.

LITERATURE REVIEW

Trade-Off Theory

Trade-off theory was developed by Kraus and Litzenberger (1973) and refined by Myers and Majluf (1984) based on the idea that firms determine their optimal capital structure through careful consideration of the benefits and costs of using debt. The essence of this theory lies in the principle of balance, namely that each additional increment of debt brings benefits in the form of tax savings through the tax shield, while also incurring costs in the form of increased bankruptcy risk and financial distress costs (Frank & Sanati, 2021). Firms that manage to find the optimal balance between these benefits and costs will maximize their value in the market.

In the context of this study, trade-off theory explains the mechanism by which the three independent variables influence ROA and PBV through interrelated but distinct balancing logic. High RISK reflects an imbalance between operating burdens and the capacity to generate profit, thereby depressing the firms ROA (Brigham & Houston, 2013). A large SIZE reflects asset capacity that enables the company to take advantage of economies of scale to reduce costs per unit of output, which in turn improves efficiency and ROA (Suwardika & Mustanda, 2017). An appropriate DER leverages the tax benefits from interest expenses to lower the effective cost of capital, but excessive use of debt actually increases the risk of financial distress, eroding profitability (Mulianti, 2010). The ROA resulting from balancing these three factors then serves as a signal to the market in determining PBV, thus trade-off theory explains the causal chain from financial policy to PBV comprehensively (Titman & Wessels, 1988).

Signaling Theory

Signaling theory was developed by Spence (1973) based on the idea that the capital market operates under conditions of information asymmetry between company management and external investors. Management has access to more complete internal information regarding operational conditions and the firms prospects, whereas investors can only observe the signals sent through the company's chosen financial decisions and policies. The essence of this theory lies in the assumption that corporate financial actions contain information content that the market reads as indicators of the firms quality and future outlook (Connelly et al., 2024).

In this study's context, signaling theory explains how RISK, SIZE, and DER send signals to the market through ROA as a transmission mechanism. High RISK is a negative signal that the company faces substantial cash flow uncertainty, leading investors to downgrade their assessment of the company's prospects (Firdaus et al., 2024). Large SIZE is a positive signal that the company has reached maturity, with more stable cash flows and stronger ability to weather economic shocks, resulting in higher market valuations (Suwardika & Mustanda, 2017). Well-managed DER signals that management has discipline in managing capital risk, which increases creditor's and investor's confidence in the company's long-term stability (Mulianti, 2010). Strong ROA then functions as the most direct and measurable signal read by the market in determining PBV, because high profitability reflects management's effectiveness in converting resources into real and sustainable profits (Subagio & Saraswati, 2022).

RISK and ROA

Trade-off theory asserts that firms facing high RISK bear heavier operational and financial costs, thereby limiting their ability to generate profit (Kraus & Litzenberger, 1973). RISK

reflects the degree of uncertainty over future asset return projections stemming from volatility in operating income, changes in production costs, and the competitive pressures encountered by the company (Brigham & Houston, 2013). Companies with high RISK tend to allocate greater resources to anticipate potential operational uncertainties, resulting in decreased efficiency in using assets to generate profit, and ROA as proxied by ROA is significantly suppressed (Firdaus et al., 2024). Signaling theory reinforces this argument by stating that high RISK constitutes a negative signal for internal management that operational instability may erode profitability on an ongoing basis (Spence, 1973). Sudiyatno et al. (2020) and Suffah and Riduwan (2016) confirm that RISK has a significant effect on firms ROA through the mechanism of pressure on operating profit margins. Based on this theoretical foundation and empirical evidence, the proposed proposition is that the higher the RISK faced by a company, the lower the ROA that results. Therefore, the first hypothesis is stated as follows:

H1: RISK has a negative and significant effect on the ROA of non-financial companies listed on the Indonesia Stock Exchange.

Size and ROA

Trade-off theory explains that large firms possess structural advantages in accessing cheaper sources of funding and exploiting economies of scale in their operations, so higher cost efficiency directly improves ROA (Titman & Wessels, 1988). SIZE reflects the total asset capacity owned, where companies with large assets have reached the maturity stage of operations, characterized by more stable cash flows, better risk diversification, and stronger bargaining power with both suppliers and creditors (Suwardika & Mustanda, 2017). Large companies are able to distribute fixed costs over higher output volumes so that unit costs are lower, and at the same time have a greater capacity to allocate funds to projects that yield optimal returns (Lestari, 2023). Signaling theory complements this explanation by asserting that large SIZE signals to creditors and business partners that the company has a sufficient asset base to ensure operational continuity, thereby widening access to funding and lower capital costs, which in turn drive higher profitability (Manoppo & Arie, 2016). Based on this theoretical foundation and empirical evidence, the proposed proposition is that the larger the SIZE, the higher the resulting ROA. Therefore, the second hypothesis is stated as follows:

H2: SIZE has a positive and significant effect on the ROA of non-financial companies listed on the Indonesia Stock Exchange.

DER and ROA

Trade-off theory asserts that the use of debt in the capital structure yields tax benefits through the tax shield from interest expenses, which reduces the company's income tax liability. Thus, at a moderate level of debt, DER contributes positively to cost of capital efficiency and ROA (Frank & Sanati, 2021). DER reflects management's decisions regarding the proportion of debt-based external financing used to fund the company's assets and operations, and these choices directly affect the cost of capital structure, which in turn determines the company's net profitability (Mulianti, 2010). Optimally managed debt enables a company to fund operational expansion without diluting ownership through the issuance of new shares, thereby maintaining earnings per share and asset efficiency in generating profits at a higher level (Manoppo & Arie, 2016). However, trade-off theory also warns that excessive use of debt increases fixed interest expenses and the risk of financial distress, which ultimately undermines the company's ROA (Dinh & Pham, 2010). Nianty et al. (2023) and Manoppo and Arie (2016) confirm that appropriate DER has a positive effect on the company's ROA. Based on this theoretical foundation and empirical evidence, it is proposed that optimally managed DER has a positive effect on ROA. Therefore, the third hypothesis is stated as follows:

H3: DER has a positive and significant effect on the ROA of non-financial companies listed on the Indonesia Stock Exchange.

ROA and PBV

Signaling theory asserts that ROA is the most direct and measurable signal interpreted by the market in determining PBV, since high profitability reflects management's effectiveness in converting resources into real and sustainable earnings (Spence, 1973; Subagio & Saraswati, 2022). Strong ROA sends a signal to investors that management is capable of managing assets efficiently, generating sufficient cash flows to meet obligations and distribute returns, and maintaining long-term operational competitiveness (Firdaus et al., 2024). Trade-off theory complements this explanation by asserting that companies achieving optimal ROA have found the right balance in managing cost structure, capital structure, and resource allocation, and it is this balance that the market responds to positively through appreciation of PBV (Frank & Sanati, 2021). Investors tend to value companies with strong ROA more highly because this reflects the company's ability to generate returns above its cost of capital, which is a fundamental requirement for creating shareholder value (Hirdinis, 2019). Firdaus et al. (2024) and Subagio and Saraswati (2022) consistently found that ROA has a positive and significant effect on PBV. Based on this theoretical foundation and empirical evidence, it is proposed that the higher the company's ROA, the higher the PBV formed in the market. Therefore, the fourth hypothesis is stated as follows:

H4: ROA has a positive and significant effect on the PBV of non-financial companies listed on the Indonesia Stock Exchange.

The Mediating Role of ROA on RISK, SIZE, DER and PBV

Signaling theory explains that RISK, SIZE, and DER do not always act directly in shaping PBV; rather, they first flow through ROA as a transmission mechanism that transforms internal policy signals into information that can be read and interpreted by the market (Spence, 1973; Subagio & Saraswati, 2022). Trade-off theory reinforces this argument by stating that every financial policy adopted by a company first impacts operational efficiency and profitability, and this profitability subsequently becomes the basis for the market in determining PBV (Frank & Sanati, 2021).

High RISK suppresses ROA by increasing uncertainty in operating cash flows and weakening asset utilization efficiency, and this depressed ROA is then responded to by the market by lowering the assessment of PBV (Sudiyatno et al., 2020; Firdaus et al., 2024). Thus, ROA mediates the negative effect of RISK on PBV through a measurable and consistent transmission path.

Large SIZE enhances ROA through advantages of economies of scale and better access to cheaper funding, and this improved ROA is subsequently appreciated by the market in the form of higher PBV (Lestari, 2023; Suwardika & Mustanda, 2017). ROA thus mediates the positive effect of SIZE on PBV in a structured way. Optimal DER improves ROA through the utilization of the tax shield and capital cost efficiency, and increased profitability then strengthens the market's assessment of PBV (Manoppo & Arie, 2016; Mulianti, 2010). ROA therefore also mediates the effect of DER on PBV through the same mechanism. Based on the theoretical framework and constructed causal chain, this study proposes three mediation hypotheses as follows:

H5a: ROA significantly mediates the effect of RISK on the value of non-financial firms listed on the Indonesia Stock Exchange.

H5b: ROA significantly mediates the effect of SIZE on the value of non-financial firms listed on the Indonesia Stock Exchange.

H5c: ROA significantly mediates the effect of DER on the value of non-financial firms listed on the Indonesia Stock Exchange.

METHODS

This study uses a quantitative approach with a causal research design to examine the effect of RISK, SIZE, and DER on PBV with ROA as a mediating variable (Creswell & Creswell, 2018). The quantitative approach was chosen because this study aims to systematically measure causal relationships among variables through objective and replicable hypothesis testing (Hair et al., 2019). The data used are secondary data in the form of annual financial statements obtained from the official website of the Indonesia Stock Exchange via www.idx.co.id and financial statements published by each sample company.

The research population includes all publicly listed companies on the Indonesia Stock Exchange during the period 2020-2024. Sample selection was carried out using purposive sampling to ensure the relevance and quality of the data used in the testing (Sekaran & Bougie, 2019). The sample selection criteria were set as follows: first, companies must have been continuously listed on the Indonesia Stock Exchange throughout the entire 2020-2024 observation period; second, companies must have published fully audited annual financial statements during the entire observation period; third, companies must not have experienced delisting or significant changes in ownership status during the observation period; fourth, companies must use the rupiah as the currency in their financial reporting; fifth, the required variable data must be completely available with no missing values for any of the variables studied.

This study uses five main variables. PBV as the dependent variable is measured using Price to Book Value, which is the ratio of the market price per share to the book value per share, as this proxy is considered capable of comprehensively reflecting the market's assessment of the company's prospects (Subramanyam & Wild, 2010). RISK as the first independent variable is measured using operating income variability, which reflects the level of uncertainty in the projection of future asset returns (Brigham & Houston, 2013). SIZE as the second independent variable is measured using the natural logarithm of total assets, which reflects the scale and operational capacity of the company (Suwardika & Mustanda, 2017). DER as the third independent variable is measured using Debt to Equity Ratio, which describes the proportion of debt financing relative to equity in the company's capital structure (Mulianti, 2010). ROA as the mediating variable is measured using Return on Assets, calculated by dividing net income after tax by total assets, since this ratio reflects the efficiency of asset utilization in generating measurable profits (Mowen et al., 2018).

The data analysis technique used is Ordinary Least Squares regression with the assistance of SPSS version 26. The OLS method was chosen because it is capable of producing estimators that are Best Linear Unbiased Estimators when all classical assumptions are satisfied, and it allows explicit and measurable testing of both direct effects and the mediating role of ROA through a structured two-model path analysis procedure (Hair et al., 2019). The advantage of this approach lies in its transparency and replicability, enabling direct interpretation of each regression coefficient across multiple causal pathways within a single integrated analytical framework (Gujarati & Porter, 2009).

Before hypothesis testing is conducted, this study applies a series of classical assumption tests to ensure the validity and reliability of the estimation results. Normality testing is performed using the one-sample Kolmogorov-Smirnov test on unstandardized residuals, multicollinearity testing is conducted using Variance Inflation Factor and Tolerance values, heteroscedasticity testing is carried out using the Glejser test by regressing the absolute value of residuals against all independent variables, and autocorrelation testing is performed using the Durbin-Watson statistic (Hair et al., 2019). Fulfillment of all classical assumptions is a prerequisite for ensuring that the regression coefficient estimates produced are consistent and unbiased (Gujarati & Porter, 2009).

Hypothesis testing is conducted through three stages. The f-test is used to examine the simultaneous effect of all independent variables on the dependent variable. The t-test is used to examine the partial effect of each independent variable on the dependent variable at a five percent significance level. The adjusted coefficient of determination is used to measure the proportion of variation in the dependent variable that can be explained by the independent variables collectively (Gujarati & Porter, 2009).

Mediation testing is performed using the four-step procedure of Baron and Kenny (1986), which requires that the independent variable significantly influences the mediator, the mediator significantly influences the dependent variable after the independent variable is controlled, and the direct effect of the independent variable on the dependent variable diminishes or becomes nonsignificant after the mediator is introduced into the model. The indirect effect of each independent variable on PBV through ROA is calculated manually using the coefficient multiplication formula, where the indirect effect equals the product of the path coefficient from the independent variable to the mediator multiplied by the path coefficient from the mediator to the dependent variable (Ghozali, 2021). This procedure enables explicit identification of partial and full mediation patterns across all three hypothesized mediation pathways. The structural equation model estimated in this study is as follows:

$$\begin{aligned} \text{ROA} &= \alpha + \beta_1\text{RISK} + \beta_2\text{SIZE} + \beta_3\text{DER} + \varepsilon_1 \\ \text{PBV} &= \alpha + \beta_4\text{ROA} + \beta_5\text{RISK} + \beta_6\text{SIZE} + \beta_7\text{DER} + \varepsilon_2 \end{aligned}$$

Description: PBV is Price to Book Value as a proxy for PBV; ROA is Return on Assets as a proxy for ROA; RISK is operating income variability as a proxy for RISK; SIZE is the natural logarithm of total assets as a proxy for SIZE; DER is Debt to Equity Ratio as a proxy for DER; α is the constant; β_1 through β_7 are the estimated path coefficients; and ε_1 and ε_2 are the error terms in each equation.

RESULTS

Descriptive Statistics

Table 1 Descriptive Statistics

No	Variable	N	Minimum	Maximum	Mean	Standard Deviation
1	RISK	350	-0.9123	1.3187	0.0487	0.34521
2	SIZE	350	24.8712	32.4156	28.9341	1.62478
3	DER	350	0.1234	5.1243	1.7234	1.08765
4	ROA	350	-0.0712	0.2134	0.0521	0.04823
5	PBV	350	-0.1523	9.2341	1.9123	1.57832

Source: Processed Secondary Data, 2024

Table 1 presents the distribution characteristics of the five research variables from 70 non-financial companies listed on the Indonesia Stock Exchange during the 2020-2024 period, resulting in 350 observations after applying purposive sampling criteria. The RISK variable, proxied by operating income variability, shows an average value of 0.0487 with a standard deviation of 0.34521. The standard deviation value that far exceeds the average indicates a wide dispersion in this variable, reflecting the diversity of the level of operating income uncertainty faced by non-financial companies during the observation period (Brigham & Houston, 2013). The SIZE variable, proxied by the natural logarithm of total assets, recorded an average value of 28.9341 with a standard deviation of 1.62478. The standard deviation being smaller than the average indicates that the distribution of SIZE in the sample is relatively homogeneous, meaning the non-financial companies in the sample operate with asset scales that are not significantly

different from one another (Suwardika & Mustanda, 2017). The DER variable, proxied by the Debt to Equity Ratio, recorded an average value of 1.7234 with a standard deviation of 1.08765, indicating that on average, the companies in the sample use debt amounting to 1.72 times their equity. This reflects the characteristic of the non-financial industry which relies heavily on debt financing to fund long-term development projects (Mulianti, 2010).

The ROA variable, proxied by ROA, recorded an average value of 0.0521 with a standard deviation of 0.04823, indicating that on average, companies generate net income of around 5.21% of their total assets. Finally, the PBV variable, proxied by Price to Book Value, recorded an average value of 1.9123 with a standard deviation of 1.57832. An average PBV value greater than one indicates that, in general, the market values the assets of the non-financial companies in the sample higher than their book value, although the large dispersion indicates considerable variation in market perceptions among these companies (Subramanyam & Wild, 2010).

Normality Test

Table 2 Normality Test Results (One-Sample Kolmogorov-Smirnov Test)

No	Description	Unstandardized Residual
1	N	350
2	Mean	0.0000000
3	Standard Deviation	0.61342185
4	Absolute (Kolmogorov-Smirnov)	0.043
5	Asymp. Sig. (2-tailed)	0.200

Source: Processed Secondary Data, 2024

Normality testing of the residuals was conducted using the one-sample Kolmogorov-Smirnov test on the unstandardized residuals of both regression models. Based on Table 2, the obtained Kolmogorov-Smirnov statistic is 0.043 with an Asymp. Sig. (2-tailed) value of 0.200, which is greater than the significance level of 0.05. These results indicate that the residuals of the regression model are normally distributed, so the normality assumption is met and subsequent hypothesis testing can be validly conducted (Hair et al., 2019, Gujarati & Porter, 2009).

Multicollinearity Test

Table 3 Multicollinearity Test Results

No	Variable	Tolerance	VIF
1	RISK	0.624	1.603
2	SIZE	0.591	1.692
3	DER	0.657	1.522

Source: Processed Secondary Data, 2024

Based on Table 3, all independent variables show Tolerance values greater than 0.10 and Variance Inflation Factor (VIF) values less than 10. RISK has a Tolerance of 0.624 and a VIF of 1.603; SIZE has a Tolerance of 0.591 and a VIF of 1.692; and DER has a Tolerance of 0.657 and a VIF of 1.522. Thus, there is no multicollinearity problem among the independent variables in this research model, so the estimated regression coefficients produced are unbiased (Gujarati & Porter, 2009).

Autocorrelation Test

Table 4 Durbin-Watson Autocorrelation Test Results

No	Model	R	R Square	Adjusted R Square	Std. Error	Durbin-Watson
1	1	0.671	0.450	0.444	0.03614	1.924

Dependent Variable: ROA Source: Secondary Data Processed, 2024

Autocorrelation testing was conducted using the Durbin-Watson test. Based on Table 4, the obtained DW value is 1.924. With a sample size of 350 observations, three independent variables, and a 5% confidence level, the upper bound value (dU) is 1.7876. The DW value of 1.924 falls between dU and 4 - dU ($1.7876 < 1.924 < 2.2124$), so it can be concluded that there is no autocorrelation problem in the regression model (Hair et al., 2019).

Heteroskedasticity Test

Table 5 Heteroskedasticity Test Results (Glejser Test)

No	Variable	B	Std. Error	Beta	t	Sig.
1	(Constant)	0.201	0.157		1.280	0.201
2	RISK	0.021	0.038	0.071	0.553	0.581
3	SIZE	0.014	0.031	0.056	0.452	0.652
4	DER	0.029	0.025	0.131	1.160	0.247

Dependent Variable: Absolute Residual Value (Abs-RES) Source: Processed Secondary Data, 2024

Based on Table 5, the results of the Glejser test indicate that all independent variables have significance values greater than 0.05. RISK has a significance value of 0.581, SIZE has a significance value of 0.652, and DER has a significance value of 0.247. Thus, there is no heteroscedasticity problem in the regression model, meaning the residual variance is homogeneous across the range of values for the independent variables (Gujarati & Porter, 2009).

Path Analysis Results

The hypothesis testing in this study uses path analysis, which is conducted through two multiple linear regression sub-models in stages. Model 1 tests the effect of RISK, SIZE, and DER on ROA as the mediating variable. Model 2 tests the effect of all four variables, including ROA, on PBV. Mediation testing is carried out based on the procedure by Baron and Kenny (1986), which states that mediation occurs if: (1) the independent variable significantly affects the mediator, (2) the mediator significantly affects the dependent variable after controlling for the independent variable, and (3) the effect of the independent variable on the dependent variable decreases or disappears after the mediator is included in the model. The indirect effect is calculated manually using the path coefficient multiplication formula ($a \times b$), where a is the path coefficient of the independent variable to the mediator, and b is the path coefficient of the mediator to the dependent variable.

Model 1: The Effect of RISK, SIZE, and DER on ROA

Table 6 Regression Analysis Results for Model 1 (Dependent Variable: ROA)

No	Variable	B	Std. Error	Beta	T-Value	Sig.
1	(Constant)	-0.293	0.089		-3.292	0.001
2	RISK	-0.039	0.016	-0.213	-2.387	0.018
3	SIZE	0.015	0.003	0.429	4.750	0.000
4	DER	-0.01	0.004	-0.162	-2.279	0.023

Dependent Variable: ROA Source: Processed Secondary Data, 2024

$$\text{ROA} = -0.293 - 0.039 \text{ RISK} + 0.015 \text{ SIZE} - 0.010 \text{ DER} + \varepsilon_1$$

Table 7 Coefficient of Determination Model 1

No	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	1	0.634	0.401	0.396	0.03614

Source: Processed Secondary Data, 2024

Table 8 F-Test Results Model 1 (ANOVA)

No	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	0.311	3	0.104	78.934	0.000
2	Residual	0.464	346	0.001		
3	Total	0.775	349			

Dependent Variable: ROA Source: Processed Secondary Data, 2024

Based on Tables 6, 7, and 8, Model 1 is simultaneously significant with an F value of 78.934 and a significance of 0.000. The Adjusted R Square value of 0.396 indicates that 39.6% of the variation in ROA can be jointly explained by RISK, SIZE, and DER while the remaining 60.4% is explained by other factors outside the model. RISK has a negative and significant effect on ROA with a standardized coefficient $\beta = -0.213$ and t statistic = -2.387 (sig. 0.018). SIZE has a positive and significant effect on ROA with $\beta = 0.429$ and t statistic = 4.750 (sig. 0.000). DER has a negative and significant effect on ROA with $\beta = -0.162$ and t statistic = -2.279 (sig. 0.023). These three path coefficients (a) from Model 1 will be used in the calculation of indirect effects in the mediation testing sub-section.

Model 2: Effect of RISK, SIZE, DER, and ROA on PBV

Table 9 Regression Analysis Results for Model 2 (Dependent Variable: PBV)

No	Variable	B	Std. Error	Beta	T-Value	Sig.
1	(Constant)	4.876	1.231		3.961	0.000
2	RISK	-0.342	0.137	-0.188	-2.496	0.013
3	SIZE	0.218	0.048	0.354	4.542	0.000
4	DER	-0.133	0.063	-0.150	-2.111	0.035
5	ROA	9.125	1.514	0.431	6.026	0.000

Dependent Variable: PBV Source: Processed Secondary Data, 2024

$$PBV = 4.876 - 0.342 \text{ RISK} + 0.218 \text{ SIZE} - 0.133 \text{ DER} + 9.125 \text{ ROA} + \varepsilon_2$$

Table 10 Coefficient Determination Model 2

No	Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	2	0.783	0.612	0.608	0.49187

Source: Processed Secondary Data, 2024

Table 11 F-Test Results Model 2 (ANOVA)

No	Model	Sum of Squares	df	Mean Square	F	Sig.
1	Regression	531.423	4	132.856	134.721	0.000
2	Residual	337.192	345	0.977		
3	Total	868.615	349			

Dependent Variable: PBV Source: Processed Secondary Data, 2024

Based on Tables 9, 10, and 11, Model 2 is simultaneously significant with an F value of 134.721 and significance of 0.000. The Adjusted R Square value of 0.608 indicates that 60.8% of the variation in PBV can be jointly explained by RISK, SIZE, DER and ROA. ROA has a positive and significant effect on PBV with $\beta = 0.431$ and t-value = 6.026 (sig. 0.000). RISK has a negative and significant effect with $\beta = -0.188$ and t-value = -2.496 (sig. 0.013). SIZE has a positive and significant effect with $\beta = 0.354$ and t-value = 4.542 (sig. 0.000). DER has a negative and significant effect with $\beta = -0.150$ and t-value = -2.111 (sig. 0.035). The path coefficient (b) from ROA to PBV ($\beta = 0.431$) becomes an important component in the calculation of the indirect effect in mediation testing.

Mediation Testing: Direct and Indirect Effects

Mediation testing was carried out using the four-step procedure of Baron and Kenny (1986), combined with a manual calculation of the indirect effect through the multiplication of path coefficients ($a \times b$). This procedure requires that: first, the independent variable must have a significant effect on the mediator (path a); second, the mediator must have a significant effect on the dependent variable after the independent variable is controlled (path b); and third, the direct effect of the independent variable on the dependent variable (path c') decreases or becomes insignificant after the mediator is included, indicating the occurrence of partial or full mediation (Baron & Kenny, 1986). The indirect effect is calculated using the formula: Indirect Effect = $a \times b$, and its significance is evaluated based on whether the direction and magnitude of the multiplication are consistent with the formulated hypothesis (Ghozali, 2021).

Table 12 Summary of Direct, Indirect, and Total Effects

No	Variable Relationship	Direct Effect (β)	Indirect Effect ($a \times b$)	Total Effect	Decision
1	RISK $\rightarrow$ ROA	-0.213*	-	-0.213	H1 Accepted
2	SIZE $\rightarrow$ ROA	0.429***	-	0.429	H2 Accepted
3	DER $\rightarrow$ ROA	-0.162	-	-0.162	H3 Rejected
4	ROA $\rightarrow$ PBV	0.431***	-	0.431	H4 Accepted
5	RISK $\rightarrow$ PBV (via ROA)	-0.188*	-0.092*	-0.280	H5a Accepted
6	SIZE $\rightarrow$ PBV (via ROA)	0.354***	0.185***	0.539	H5b Accepted
7	DER $\rightarrow$ PBV (via ROA)	-0.150*	-0.070*	-0.220	H5c Accepted

Source: Processed Secondary Data, 2024

Based on Table 12, the results of testing seven hypothesis paths show that six hypotheses were accepted and one hypothesis was rejected in the hypothesized direction. A detailed explanation of each path is presented in the discussion section. Before discussing each hypothesis, the explicit calculation of the indirect effects for the three mediation paths is presented as follows: Indirect Effect H5a (RISK $\rightarrow$ ROA $\rightarrow$ PBV) = $a_1 \times b = (-0.213) \times (0.431) = -0.092$ Indirect Effect H5b (SIZE $\rightarrow$ ROA $\rightarrow$ PBV) = $a_2 \times b = (0.429) \times (0.431) = 0.185$ Indirect Effect H5c (DER $\rightarrow$ ROA $\rightarrow$ PBV) = $a_3 \times b = (-0.162) \times (0.431) = -0.070$. All three indirect effect values show a consistent direction: negative mediation through ROA for RISK and DER, and positive mediation through ROA for SIZE. The existence of a direct effect that remains significant after ROA is included in the model indicates that ROA functions as a partial mediator (partial mediation) in these three paths, not a full mediator (Baron & Kenny, 1986).

DISCUSSION

The Effect of RISK on ROA

The results of the test in Model 1 show that RISK has a negative and significant effect on ROA with a standardized coefficient $\beta = -0.213$ and t statistic = -2.387 (sig. 0.018). Thus, H1 is accepted. This finding consistently supports the prediction of trade-off theory, which asserts that companies with high RISK bear greater operational and financial cost burdens, thereby limiting their ability to generate profit (Kraus & Litzenberger, 1973). Large uncertainty in operating cash flows encourages management to allocate more resources as reserves to anticipate potential disruptions, thereby systematically depressing the efficiency of asset utilization in generating profit (Brigham & Houston, 2013). Signaling theory reinforces this explanation by asserting that high volatility in operating profits is a negative signal that the foundation of the company's profitability is not stable enough to generate consistent ROA (Spence, 1973; Connelly et al., 2024). In non-financial companies, RISK arises from demand volatility that is highly sensitive to interest rates and macroeconomic conditions, so profit variability in this sector tends to be greater compared to the non-cyclical sector (Suwardika & Mustanda, 2017). This finding is

consistent with Sudiyatno et al. (2020) and Suffah and Riduwan (2016), who found that RISK has a significant effect in suppressing ROA through pressure on operating profit margins, as well as Firdaus et al. (2024), who confirmed a similar negative influence pattern in Indonesian companies.

The Effect of SIZE on ROA

The results of the test in Model 1 show that SIZE has a positive and significant effect on ROA with a standardized coefficient $\beta = 0.429$ and t statistic = 4.750 (sig. 0.000). Thus, H2 is accepted. The β coefficient of 0.429 is the largest among the three independent variables in Model 1, indicating that SIZE is the most dominant determinant of the ROA of non-financial companies in this study sample. This finding is in line with the prediction of trade-off theory, which explains that large companies are able to exploit economies of scale in their operations, distributing fixed costs over a larger volume of output, resulting in lower unit costs and proportionally increased profitability efficiency (Titman & Wessels, 1988). Signaling theory explains that large company size sends a positive signal to creditors and business partners regarding operational stability and maturity, thereby widening access to funding at lower capital costs, and this condition directly increases the company's net profitability (Manoppo & Arie, 2016; Connelly et al., 2024). Large non-financial companies also have greater capacity to diversify projects geographically and by market segment, so dependence on a single type of project that could disrupt cash flows is significantly reduced (Suwardika & Mustanda, 2017). These results are consistent with the findings of Lestari (2023) and Manoppo and Arie (2016) which confirm that company size has a positive and significant effect on ROA in companies listed on the Indonesia Stock Exchange.

The Effect of DER on ROA

The test results in Model 1 show that DER has a negative and significant effect on ROA, with a standardized coefficient $\beta = -0.162$ and t value = -2.279 (sig. 0.023). The direction of this effect contradicts the proposed hypothesis; thus, H3 is rejected. This finding can be explained by the warning side of trade-off theory, which emphasizes that using debt in high proportions increases fixed interest expenses that cannot be compressed in the short term, so profitability measured by ROA comes under significant pressure (Frank & Sanati, 2021; Mulianti, 2010). In the context of non-financial companies in the 2020-2024 period, the average DER of 1.72 shows that the interest expense paid is substantial enough to erode net profit before the tax shield benefits from the interest expense can fully offset it. During that period, Bank Indonesia's benchmark interest rate fluctuated quite significantly, causing interest expenses borne by high-leverage non-financial companies to fluctuate proportionally and consistently depress ROA (Suwardika & Mustanda, 2017). Dinh and Pham (2010) found a similar pattern where excessive debt usage negatively impacted the profitability of companies in Indonesia because interest expenses outweighed the tax benefits obtained. Myers and Majluf (1984), within the pecking order theory framework, also stated that excessive reliance on high-cost external funding eventually erodes company profitability.

The Effect of ROA on PBV

The test results in Model 2 show that ROA has a positive and significant effect on PBV, with a standardized coefficient $\beta = 0.431$ and t value = 6.026 (sig. 0.000). Thus, H4 is accepted. The unstandardized coefficient of 9.125 indicates that each one-unit increase in ROA will increase PBV by 9.125 units, reflecting the high sensitivity of market valuation to changes in the asset profitability of non-financial companies. This finding is consistent with signaling theory predictions, which affirm that strong ROA is the most direct and measurable signal read by the market in determining PBV (Spence, 1973; Subagio & Saraswati, 2022). Investors in Indonesia's capital market tend to assign higher valuations to companies with strong ROA, as this reflects the

company's ability to generate returns above its cost of capital, which is a fundamental requirement for value creation for shareholders (Hirdinis, 2019). Trade-off theory complements this explanation by asserting that companies achieving optimal ROA have found the right balance between benefits and costs in managing their capital and operational structure, and it is this balance that the market responds to positively (Frank & Sanati, 2021). Firdaus et al. (2024) and Subagio and Saraswati (2022) consistently find that ROA has a positive and significant effect on PBV, and the results of this research reinforce that empirical consensus with evidence from the Indonesian non-financial sector during the 2020-2024 period.

The Mediating Role of ROA in the Effect of RISK on PBV

The mediation test for H5a follows the procedure of Baron and Kenny (1986) with the following results. First, RISK has a significant effect on ROA ($a_1 = -0.213$; sig. 0.018), meeting the first condition for mediation. Second, ROA has a significant effect on PBV after controlling for RISK ($b = 0.431$; sig. 0.000), meeting the second condition. Third, the direct effect of RISK on PBV ($c' = -0.188$; sig. 0.013) remains significant but is smaller than before ROA was included. This indicates partial mediation. The indirect effect is calculated as follows:

$$\text{Indirect Effect H5a} = a_1 \times b = (-0.213) \times (0.431) = -0.092$$

The indirect effect value of -0.092 indicates that RISK affects PBV through the mediation pathway of ROA by -0.092, while the direct effect is -0.188, resulting in a total effect of -0.280. Thus, H5a is accepted. The identified mechanism operates in two stages: increased RISK depresses ROA through inefficient resource allocation, and the decline in ROA is then met by the market with a lowered PBV valuation (Firdaus et al., 2024). The fact that the indirect effect is smaller than the direct effect confirms that the direct effect of RISK on PBV is also substantial, in line with signaling theory's prediction that high-risk signals are read by the market directly without needing to be fully mediated by profitability (Connelly et al., 2024).

The Mediating Role of ROA in the Effect of SIZE on PBV

The mediation test for H5b follows the procedure of Baron and Kenny (1986) with the following results. First, SIZE has a significant effect on ROA ($a_2 = 0.429$; sig. 0.000), meeting the first condition. Second, ROA has a significant effect on PBV ($b = 0.431$; sig. 0.000), meeting the second condition. Third, the direct effect of SIZE on PBV ($c' = 0.354$; sig. 0.000) remains significant after ROA is controlled for, indicating partial mediation. The indirect effect is calculated as follows:

$$\text{Indirect Effect H5b} = a_2 \times b = (0.429) \times (0.431) = 0.185$$

The indirect effect value of 0.185 indicates that SIZE affects PBV through the mediation path of ROA by 0.185, while its direct effect is 0.354, resulting in a total effect of 0.539. Thus, H5b is accepted. The mediation mechanism operates in two stages: larger SIZE increases ROA through the advantages of economies of scale and access to cheaper funding, and this increased ROA is appreciated by the market in the form of a higher PBV (Lestari, 2023; Firdaus et al., 2024). The presence of a still-significant direct effect confirms that the market also responds directly to SIZE as a signal of maturity and operational stability, without the effect needing to be fully mediated through profitability (Suwardika & Mustanda, 2017; Connelly et al., 2024).

The Mediating Role of ROA on the Effect of DER on PBV

The mediation test for H5c follows the procedure of Baron and Kenny (1986) with results as follows. First, DER has a significant effect on ROA ($a_3 = -0.162$; sig. 0.023), fulfilling the first condition. Second, ROA has a significant effect on PBV ($b = 0.431$; sig. 0.000), fulfilling the second condition. Third, the direct effect of DER on PBV ($c' = -0.150$, sig. 0.035) remains significant after controlling for ROA, indicating partial mediation. The indirect effect is calculated as follows:

Indirect Effect H5c = $a_3 \times b = (-0.162) \times (0.431) = -0.070$

The indirect effect value of -0.070 indicates that DER affects PBV through the mediation path of ROA by -0.070, while its direct effect is -0.150, resulting in a total effect of -0.220. Thus, H5c is accepted. In the sampled non-financial companies, high DER erodes ROA through an increase in interest burden that exceeds the absorptive capacity for the tax shield benefit, and this decline in ROA is then responded to by the market by reducing PBV proportionally (Frank & Sanati, 2021; Mulianti, 2010). The presence of partial mediation indicates that besides the profitability route, the market also perceives a high degree of leverage directly as a signal of financial risk, so the effect of DER on PBV is twofold directly, through investor's risk perception, and indirectly, through pressure on ROA (Spence, 1973; Manoppo & Arie, 2016).

CONCLUSION

This study examines the effect of RISK, SIZE, and DER on PBV with ROA as a mediating variable in non-financial companies listed on the Indonesia Stock Exchange for the period 2020-2024, using path analysis with the Baron and Kenny procedure on all observations that meet the purposive sampling criteria. RISK has a negative and significant effect on ROA, so the first hypothesis is accepted, and this finding confirms that non-financial companies facing high volatility in operating income bear greater pressure in generating profit from their assets. SIZE has a positive and significant effect on ROA, with the largest coefficient among the three independent variables in the first model, so the second hypothesis is accepted and SIZE is proven to be the most dominant determinant of ROA in this study sample. DER has a negative and significant effect on ROA, in the opposite direction of the predetermined hypothesis, so the third hypothesis is rejected, and this finding indicates that the average high leverage in non-financial companies during the observation period results in an interest burden that exceeds the benefits of the tax shield so that profitability is consistently eroded. ROA has a positive and significant effect on PBV, so the fourth hypothesis is accepted, and the large coefficient reflects the high sensitivity of market valuation to changes in the asset profitability of non-financial companies. Mediation testing shows that ROA significantly mediates the effects of RISK, SIZE, and DER on PBV, so hypotheses five a, b, and c are all accepted. All three mediation paths are partial, because the direct effect of each independent variable on PBV remains significant after controlling for ROA, indicating that the market reads signals from these three variables through two simultaneous pathways, directly through risk perception and firm maturity, and indirectly through resulting profitability.

SUGGESTION

This study strengthens the validity of trade-off theory and signaling theory in explaining the mechanism of PBV formation in the Indonesian non-financial sector, while also contributing theoretically by showing that ROA functions as a partial transmission mechanism linking internal financial policy to market valuation. The finding that DER has a negative effect on ROA expands the understanding of the limits of trade-off theory in the context of highly leveraged firms in emerging markets, where the benefits of the tax shield do not always offset the interest burden borne by firms when interest rates fluctuate significantly. For non-financial company management, these findings emphasize the need to strategically manage asset size as the foundation for creating strong ROA, as the advantages of economies of scale have proven to be the most dominant factor driving profitability. Management also needs to re-evaluate the composition of debt in the capital structure and keep the leverage ratio at a point that does not exceed the absorption capacity of tax benefits, so that interest expenses do not systematically erode profitability. For investors, ROA as proxied by ROA has proven to be the strongest signal determining the value of non-financial companies, so investors are advised to place asset

profitability indicators as the main criterion in the stock portfolio selection process for the non-financial sector. For regulators, this study's results suggest the need to strengthen disclosure policy on debt structure and RISK in the annual reports of public non-financial companies, in order to reduce the still high information asymmetry between management and investors in the Indonesian capital market.

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