



## The role of business risk in moderating the effect of capital structure on firm performance (Empirical Evidence from Manufacturing Companies Listed on the Indonesia Stock Exchange during 2021–2024)

Faiz Fairuz Ikbar, Andrian Budi Prasetyo\*

Department of Accounting, Faculty of Economics and Business, Diponegoro University, Semarang, Indonesia

Corresponding Author: Andrian Budi Prasetyo

DOI: <https://doi.org/10.66856/ijmrd.2026.13.2.13304>

### Abstract

Spanning the 2021–2024 period, this quantitative inquiry examines how capital structure impacts corporate performance among manufacturing entities on the Indonesia Stock Exchange, with a specific focus on the potential intervening role of business risk. The investigation responds to ongoing empirical inconsistencies surrounding leverage-performance dynamics and addresses the sparse literature regarding the contingency function of operational risk within developing economies. Utilizing a purposive sampling strategy, the empirical framework evaluates 1,264 distinct firm-year observations through Moderated Regression Analysis (MRA). Capital structure was measured using the Debt-to-Equity Ratio (DER), firm performance was represented by Return on Assets (ROA), and business risk was reflected by operating cash flow volatility. The findings reveal that higher leverage negatively affects firm performance, indicating that excessive dependence on debt financing may weaken profitability due to increased financial commitments and potential financial distress. Nevertheless, business risk was not found to significantly alter the association between capital structure and firm performance. These results imply that the impact of leverage on corporate performance operates independently of business risk conditions. The study enriches the financial management literature by providing evidence from Indonesian manufacturing companies and offers practical insights for managers in formulating financing decisions.

**Keywords:** Capital, Structure, Firm Performance, Business Risk, Indonesian, Manufacturing

### Introduction

The increasingly volatile global economic environment requires firms to manage their financial resources efficiently to maintain sustainable performance. Firm performance reflects a company's ability to generate profit, utilize assets effectively, and ensure long-term operational sustainability (Ehrhardt & Brigham, 2020) [10]. In this context, capital structure becomes a critical financial decision, as it determines the proportion of debt and equity used to finance corporate activities.

According to Trade-Off Theory, firms determine their financing structure by weighing the benefits derived from debt, particularly tax shields, against the potential costs arising from financial distress (Jabar *et al.*, 2024) [17]. When debt levels become excessive, companies may face greater financial pressure, which can adversely affect performance due to mandatory interest payments and a higher likelihood of bankruptcy. Previous empirical evidence concerning the association between capital structure and firm performance remains inconclusive. While several studies report a favorable impact of leverage on performance, others reveal negative or statistically insignificant effects. Such variations suggest that the influence of financing decisions on corporate outcomes may depend on particular organizational or environmental conditions.

Contingency Theory suggests that financial decisions are not universally optimal but depend on firm-specific conditions, including the level of business risk (Donaldson, 2014) [9]. Business risk, which reflects the uncertainty of operating income, plays an important role in determining a

firm's ability to manage its financial obligations. Firms with high business risk are more vulnerable to financial distress, which may strengthen the negative impact of leverage on firm performance. Conversely, firms with stable cash flows may better manage debt obligations, thereby mitigating potential adverse effects.

Prior academic efforts to evaluate the moderating function of operating risk have yielded highly conflicting results. While certain investigations argue that business risk intensifies the detrimental impact of financing leverage on corporate returns, alternative empirical evidence reveals no such significant interaction. This persistent ambiguity underscores a distinct empirical gap, warranting a deeper exploration within developing economic landscapes like Indonesia, where institutional environments and corporate frameworks diverge fundamentally from industrialized nations.

Focusing on manufacturing corporations quoted on the Indonesia Stock Exchange (IDX) from 2021 to 2024, this inquiry investigates the ramifications of capital structure choices on corporate performance, alongside assessing how business risk operates as a conditional moderator. The resulting empirical breakthroughs expand the boundaries of current financial literature by supplying context-specific indicators from the Indonesian economic landscape. Furthermore, the findings provide pragmatic frameworks for corporate leaders tasked with architecting strategic and sustainable financing frameworks.

## Literature review and hypothesis formulation

### 1. Theoretical framework

Grounded in trade-off theory and contingency theory, this research elucidates the dynamic interactions among capital structure, business risk, and corporate performance.

According to trade-off theory, firms strive to establish an optimal capital structure by offsetting the advantages of debt financing against its associated costs. While leverage offers substantial benefits through tax shields, it concurrently elevates the risk of financial distress and the potential costs linked to bankruptcy (Jabar *et al.*, 2024) <sup>[17]</sup>. When firms rely excessively on debt financing, fixed financial obligations such as interest payments may reduce financial flexibility and negatively affect firm performance. Therefore, capital structure decisions are critical in maintaining an optimal balance between profitability and financial risk.

In addition, capital structure reflects a firm's financial strategy, including its flexibility, internal conditions, and managerial risk preferences (Junieta & Setyawan, 2022) <sup>[18]</sup>. This indicates that financial decisions are not solely aimed at maximizing returns but also at managing financial risks effectively.

Additionally, this research incorporates Contingency Theory, which posits that strategic decisions lack universal optimality since their outcomes are dependent upon distinct organizational frameworks (Donaldson, 2014) <sup>[9]</sup>. Within this framework, business risk serves as a critical contextual element capable of altering the link between financial leverage and firm outcomes.

Business risk essentially captures the unpredictability inherent in a firm's operational revenues and cash streams. High-risk enterprises typically face severe earnings fluctuations, complicating their ability to service fixed financial liabilities. Consequently, the adverse consequences of leverage on corporate profitability could be amplified. On the other hand, entities characterized by minimal business risk and steadier cash inflows are better equipped to handle debt obligations, thereby mitigating the detrimental repercussions of capital structure.

In summary, trade-off theory clarifies the direct linkage connecting capital structure to performance metrics, whereas contingency theory justifies the integration of business risk as a moderator. Synthesizing these frameworks, a conceptual model has been constructed to map the interactions among these variables, with the hypothesized framework illustrated in Fig 1.

### Theoretical Framework

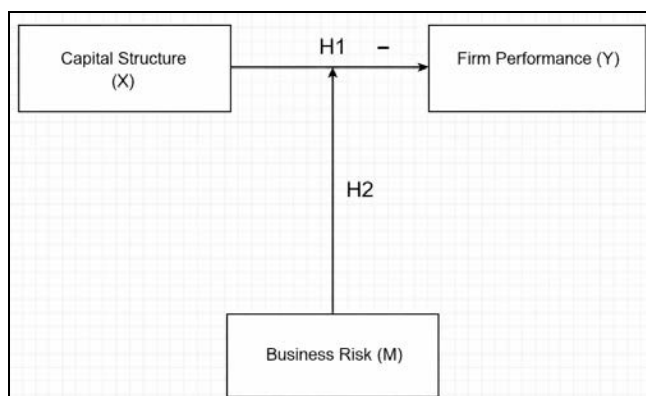


Fig 1

### 2. Hypotheses formulation

Capital structure serves as a pivotal determinant of firm performance, as it dictates the proportion of debt and equity used to finance operational activities. Elevated leverage ratios can intensify financial risks and undermine corporate profitability due to rigid interest obligations. To date, empirical investigations regarding the relationship between funding choices and corporate outcomes have yielded mixed conclusions, indicating that a definitive consensus remains elusive (Titman & Wessels, 1988; Salim & Yadav, 2012; Bui *et al.*, 2023) <sup>[7, 30, 35]</sup>.

According to trade-off theory, enterprises endeavor to optimize their capital structure by balancing the tax advantages of debt against the associated costs of financial distress. Excessive borrowing increases vulnerability to insolvency and financial distress costs, which ultimately diminishes corporate returns (Kraus & Litzenberger, 1973; Frank & Goyal, 2009) <sup>[12]</sup>. Consequently, higher leverage is anticipated to trigger a decline in firm performance. Based on these premises, the following hypothesis is proposed:

**H1:** Capital structure exerts a negative impact on corporate performance.

Furthermore, contingency theory posits that the efficacy of strategic financial decisions is conditional upon firm-specific circumstances, including the level of business risk (Donaldson, 2001). Business risk captures the unpredictability of operating revenues and the volatility of cash streams, both of which affect an organization's capacity to service its financial commitments.

Prior studies evaluating how business risk moderates this linkage have produced conflicting results. Certain researchers have argued that business risk exacerbates the detrimental effects of leverage on firm outcomes, while others observed no significant moderating interaction (Zeitun & Tian, 2007; Pham *et al.*, 2022) <sup>[27, 38]</sup>. This ongoing empirical ambiguity underscores the necessity for further exploration.

In highly volatile business environments, unstable cash inflows aggravate the likelihood of financial distress, thereby amplifying the adverse repercussions of debt utilization on performance. Conversely, entities operating under low-risk conditions demonstrate greater capability in managing their liabilities effectively. Grounded in this rationale, the following hypothesis is advanced:

**H2:** Business risk strengthens the negative impact of capital structure on corporate performance.

### Research design

This study examines manufacturing firms listed on the Indonesia Stock Exchange (IDX) between 2021 and 2024. Data were obtained from audited financial statements and annual reports available through the official IDX website and individual company websites. Additional financial information, including the Debt-to-Equity Ratio (DER), Return on Assets (ROA), and business risk measured by the standard deviation of operating cash flows, was collected from Bloomberg. The use of secondary data is appropriate because it provides publicly accessible, reliable, and verifiable financial information.

The manufacturing sector was selected because it represents one of the most significant sectors in the Indonesian

economy and is closely associated with financing decisions, production cost pressures, and business risk. Moreover, manufacturing firms generally operate with substantial fixed costs and often rely on external financing, making this sector particularly suitable for examining the relationship between capital structure and firm performance.

The sample was selected using a purposive sampling approach. The selection criteria were as follows: (1) manufacturing firms continuously listed on the IDX during 2021–2024; (2) firms that consistently published audited financial statements and annual reports throughout the observation period; (3) firms with complete data for all research variables; and (4) firms that did not report extreme losses or negative total assets during the study period. Based on these criteria, 316 firms were included in the final sample, resulting in 1,264 firm-year observations.

### 1. Data and variables

Corporate performance serves as the dependent variable in this study and is measured using Return on Assets (ROA). ROA was selected because it reflects a firm's ability to generate earnings from its asset base and indicates managerial efficiency in utilizing company resources (Ehrhardt & Brigham, 2020) <sup>[10]</sup>. The initial normality test revealed that ROA was not normally distributed. Therefore, a square root transformation was applied, resulting in the variable sqROA, which was subsequently used in the regression analysis.

Capital structure is employed as the independent variable and is measured using the Debt-to-Equity Ratio (DER). DER was chosen because it represents the proportion of debt relative to equity and is widely recognized as a measure of financial leverage and risk exposure (Titman & Wessels, 1988; Frank & Goyal, 2009) <sup>[12, 35]</sup>. Higher DER values indicate greater reliance on debt financing, which may increase financial risk and influence firm performance. Business risk is included as the moderating variable and is measured by the standard deviation of operating cash flows. This proxy captures fluctuations in operational performance and reflects uncertainty in a firm's ability to generate cash flows (Zeitun & Tian, 2007) <sup>[38]</sup>. Greater volatility in operating cash flows indicates higher business risk, which may affect the relationship between capital structure and firm performance.

Accordingly, the research model consists of firm performance (sqROA) as the dependent variable, capital structure (DER) as the independent variable, and business risk (BR) as the moderating variable.

### 2. Data analysis

Testing the proposed hypotheses relies on an empirical setup that integrates multiple linear regression within a Moderated Regression Analysis (MRA) architecture. Utilizing this specific approach facilitates a simultaneous evaluation of how capital structure directly impacts firm performance, alongside tracking the exact degree to which business risk alters this core relationship. Within contemporary financial literature, regression-based frameworks serve as an established methodological standard for mapping inter-variable interactions and validating theoretical assertions (Wooldridge, 2013; Gujarati & Porter, 2009).

Prior to model estimation, the collected dataset underwent rigorous preliminary diagnostics to ensure statistical

robustness and appropriate model fit. First, a correlation matrix was constructed to map the baseline associations between variables, offering an early detection mechanism for potential multicollinearity risks. To provide a more definitive check, the Variance Inflation Factor (VIF) metric was calculated to analyze collinearity patterns among the independent predictors. Furthermore, standard econometric validation was achieved by executing classical assumption tests—specifically targeting normality, heteroscedasticity, and autocorrelation parameters to confirm the model complies with ordinary least squares prerequisites.

In terms of variable operationalization, corporate performance represents the dependent metric, captured via the square root transformation of Return on Assets. Financing decisions act as the primary independent construct, measured through the Debt-to-Equity Ratio, while business risk is introduced as the contingent moderating factor. The structural mechanism of moderation is formally tested by incorporating a multiplicative interaction term directly into the final regression equation.

### 3. Equation

The regression models used in this study are specified as follows:

#### Model\_1 (Direct Effect):

$$\text{sqROA}_{it} = \alpha + \beta_1 \text{DER}_{it} + \varepsilon_{it}$$

#### Model\_2 (Moderating Effect):

$$\text{sqROA}_{it} = \alpha + \beta_1 \text{DER}_{it} + \beta_2 \text{BR}_{it} + \beta_3 (\text{DER} \times \text{BR})_{it} + \varepsilon_{it}$$

Where:

- sqROA<sub>it</sub> represents firm performance,
- $\alpha$  is the constant term,
- $\beta_1, \beta_2, \beta_3$  are regression coefficients,
- DER<sub>it</sub> represents capital structure,
- BR<sub>it</sub> represents business risk,
- (DERBR)<sub>it</sub> represents the interaction term,
- $\varepsilon_{it}$  is the error term.

The direct relationship between capital structure and firm performance is examined through the first regression model, while the second model incorporates business risk to determine its moderating role within that relationship.

### Findings and discussion

#### 1. Descriptive statistics

The descriptive analysis for the 1,264 firm-year observations compiled in this research is detailed in Table 1. The baseline statistical summary points to prominent variations in leverage, corporate profitability, and business risk among the investigated entities, which highlights distinct operational profiles and financial frameworks.

For capital structure, operationalized through the Debt-to-Equity Ratio, the values fluctuate from a minimum of 0.00 to a maximum of 4.88. The data reports a mean value of 0.5818 alongside a standard deviation of 0.77931, demonstrating that the observed corporations utilize debt to fund roughly 58.18% of their total equity base on average. Furthermore, the sizable standard deviation underscores wide disparities in financing decisions across the corporate sample.

Corporate performance, evaluated using Return on Assets, spans from a minimum baseline of 0.00 to a peak of 0.24. With a calculated mean of 0.0684 and a standard deviation

of 0.05588, the sampled firms generate an average return rate of 6.84% relative to their *asset allocations*. The moderate dispersion pattern suggests that the gap in profitability margins among these companies remains within a restricted bound.

Operating cash flow volatility, used to capture business risk, reveals significant shifting patterns, ranging widely between 0.00 and 3,403.72. This construct reports a mean of 137.0409 and a standard deviation of 334.15202, showing that cash flow stability and operational uncertainties diverge substantially from one enterprise to another.

The multiplicative interaction construct spans a minimum of 0.00 and goes up to a maximum threshold of 13,125.76. This combined variable establishes a mean score of 152.15709 with a standard deviation reaching 730.71519. Such an expansive spread implies that the joint dynamics of financial leverage and operating risk differ extensively among the studied corporations.

On the whole, these descriptive insights verify that the selected research variables contain adequate empirical variation, establishing a solid foundational framework for running the next phase of regression modeling.

**Table 1:** Descriptive Statistics

	N	Min	Max	Mean	Std Dev
DER	1,264	0.00	4.88	0.5818	0.77931
ROA	1,264	0.00	0.24	0.0684	0.05588
BR	1,264	0.00	3,403.72	137.0409	334.15202
DER.BR	1,264	0.00	13,125.76	152.15709	730.71519
(listwise)	1,264				

Source: secondary data processed using SPSS 25, 2026

**Table 2:** Classical Assumption Tests

Assumption Test	Indicator	Result	Criteria	Conclusion
Normality	Kolmogorov-Smirnov	Sig = 0.056	Sig > 0.05	Data are normally distributed
Multicollinearity	Tolerance / VIF	Highest VIF = 2.427	VIF < 10	No multicollinearity
Heteroscedasticity	Glejser Test	Sig DER = 0.195; BR = 0.746; DER×BR = 0.452	Sig > 0.05	No heteroscedasticity
Autocorrelation	Durbin Watson	DW = 2.113	1.5 < DW < 2.5	No autocorrelation

Source: secondary data processed using SPSS 25, 2026

### 3. Moderated regression analysis

This study employs Moderated Regression Analysis (MRA) to examine the direct effect of capital structure on firm performance and to determine whether business risk moderates this relationship. Two regression models are estimated. Model 1 evaluates the direct influence of capital structure on firm performance, whereas Model 2 incorporates business risk and the interaction term between capital structure and business risk (DER × BR) to test the moderating effect. The models are assessed using the

**Table 3:** Coefficient of Determination

Model	R Square	Adjusted R Square	Td. Error of the Estimate
1	0.079	0.078	0.10819
2	0.090	0.088	0.10763

Source: secondary data processed using SPSS 25, 2026

Based on Table 3, Model 1 has an R Square value of 0.079 and an Adjusted R Square of 0.078. This indicates that capital structure explains 7.9% of the variation in firm performance. In Model 2, the R Square value increases to 0.090 and the Adjusted R Square to 0.088, indicating that capital structure, business risk, and the interaction term jointly explain 9.0% of the variation in firm performance. The increase in the explanatory

## 2. Classical assumption tests

Prior to model estimation, the dataset underwent several diagnostic checks to ensure compliance with basic linear regression assumptions. These procedures involved evaluating the data for normality, multicollinearity, heteroscedasticity, and autocorrelation.

The Kolmogorov-Smirnov framework was applied to test for distribution normality. The analysis yielded a significance metric of 0.056; since this clears the 0.05 benchmark, the distribution is confirmed to be normal.

To detect potential collinearity issues, the Variance Inflation Factor (VIF) was checked. The maximum VIF score recorded across the variables reached 2.427, remaining safely beneath the conventional threshold of 10. This outcome demonstrates that the independent constructs do not suffer from multicollinearity problems.

Heteroscedasticity was assessed using the Glejser technique. The estimation showed that the significance values for DER (0.195), business risk (0.746), and the multiplicative interaction term (0.452) all exceeded 0.05, establishing that variance is homoscedastic throughout the model.

Finally, residual independence was verified via the Durbin-Watson statistic. A value of 2.113 was obtained, which sits comfortably within the standard baseline limits of 1.5 and 2.5, thereby indicating no autocorrelation issues. Taken together, these diagnostic outcomes validate that the regression framework meets all econometric prerequisites, confirming its suitability for subsequent hypothesis testing.

coefficient of determination (R<sup>2</sup>), F-statistics, and t-statistics.

### 3.1 Coefficient of determination

The coefficient of determination (R<sup>2</sup>) measures the extent to which the independent variables explain variations in the dependent variable. A higher R<sup>2</sup> value indicates greater explanatory power of the regression model. The results of the coefficient of determination for both models are presented in Table 3.

Power from Model 1 to Model 2 suggests that the inclusion of the moderating variable slightly improves the model, although the overall explanatory power remains relatively low.

### 3.2 Simultaneous significance test (F-statistic test)

Model fit was evaluated through the F-statistic, which assesses the joint significance of the explanatory variables

in predicting the dependent variable. The outcomes of this test for both estimated models are shown in table 4.

**Table 4:** Simultaneous Significance Test (F-statistic test)

Model	F	Prob (F-Statistic)
1	108.193	0.000
2	41.461	0.000

Source: secondary data processed using SPSS 25, 2026

Based on Table 4, Model 1 produces an F-statistic of 108.193 with a significance value of 0.000. Similarly,

Model 2 reports an F-statistic of 41.461 and a significance value of 0.000.

As the significance levels for both models are lower than 0.05, the regression models can be considered statistically significant and suitable for further analysis. These results indicate that the independent variables in each model jointly influence firm performance.

### 3.3 Partial significance test (t-statistic test)

The t-test was performed to evaluate the individual effect of each independent variable on firm performance. The results of the partial significance test are shown in Table 5.

**Table 5:** t-Statistic test Result

Model		Coefficients <sup>a</sup>				
		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0.255	0.004		63.190	0.000
	DER	-0.041	0.004	-0.286	-10.317	0.000
	BR	0.00004266	0.000	0.126	3.083	0.002
	DER.BR	-0.00004966	0.000	0.126	-0.769	0.442

a. Dependent Variable: sqROA

Source: secondary data processed using SPSS 25, 2026

The empirical outputs detailed in Table 5 demonstrate that capital structure (DER) exerts a detrimental and statistically meaningful impact on corporate performance. This is evidenced by a regression coefficient of -0.041 alongside a p-value of 0.000, confirming that elevated leverage ratios are heavily linked to a contraction in organizational outcomes. Conversely, business risk (BR) reports a positive and significant association with firm performance, generating a coefficient of 0.00004266 with a significance threshold of 0.002. Notably, the multiplicative interaction construct (DER.BR) reports a coefficient of -0.00004966 and a significance metric of 0.442, which establishes that the combined moderating effect fails to reach statistical significance.

In general, these outcomes validate that financing choices negatively dictate corporate performance metrics. However, operating volatility does not play a substantial role in restructuring or shifting the underlying baseline relationship that connects capital structure to overall performance.

### Discussion and conclusion

Investigating Indonesian manufacturing entities over the 2021–2024 period, this inquiry assesses how capital structure affects corporate performance, alongside the potential moderating capacity of business risk. The resulting empirical insights reveal that capital structure imposes a pronounced adverse effect on firm outcomes. This outcome indicates that expanding leverage ratios typically restrict profitability, primarily because rigid financial commitments and elevated risk sensitivities undermine overall returns.

This negative linkage aligns with trade-off theory, which posits that excessive leverage amplifies financial distress costs, ultimately dragging down corporate returns (Kraus & Litzenberger, 1973; Frank & Goyal, 2009) <sup>[12]</sup>. The finding also reinforces prior studies reporting a detrimental effect of leverage on firm outcomes (Salim & Yadav, 2012; Zeitun & Tian, 2007) <sup>[30, 38]</sup>. Consequently, highly leveraged enterprises face a greater risk of declining profitability as rigid interest obligations deplete their financial flexibility.

Interestingly, business risk was found to have a significant positive effect on performance. This suggests that firms with greater operational cash flow volatility can achieve higher returns, likely because aggressive risk-taking strategies open up opportunities for larger profit margins. This outcome validates the fundamental corporate finance premise that risk and return are positively correlated.

However, the interaction term combining capital structure and business risk failed to reach statistical significance. This indicates that business risk does not function as a moderator in this relationship; the impact of leverage on corporate performance is direct and remains uniform regardless of the firm's operational risk levels.

While these results do not support contingency theory—which claims that financial decision outcomes depend heavily on contextual elements like business risk (Donaldson, 2001)—they mirror past findings where operating risk failed to show a significant moderating interaction with leverage (Pham *et al.*, 2022) <sup>[27]</sup>. In the context of Indonesian manufacturing, this suggests that capital structure decisions play a far more dominant role in shaping firm performance than operational risk conditions do.

Several practical implications emerge from these insights. First, corporate managers must exercise prudence when taking on debt, as excessive leverage can severely damage profitability. Second, although operational risk is a vital business component, it does not alter how capital structure affects firm performance. Hence, corporate strategic focus should remain on optimizing financing frameworks to drive better financial outcomes.

This research contributes to the corporate finance literature by providing empirical clarity on the interplay between capital structure, business risk, and performance in an emerging market context. It highlights that the moderating effect of operating risk is not universally guaranteed, suggesting that future studies should explore alternative contingent variables.

Nonetheless, certain limitations apply. The relatively low coefficient of determination indicates that other unobserved

factors outside this model continue to drive firm performance. Additionally, because the dataset is restricted to Indonesian manufacturing companies, generalizing these outcomes to other sectors or geographic regions requires caution. Future research should expand the analytical model by incorporating other relevant variables and widening the sample across diverse industries and cross-country contexts. The research has managers, regulators, investors and stakeholder implications for the study undertaken. First, the findings suggest that corporate management should be more cautious in determining the optimal capital structure. Since capital structure has a negative and significant effect on firm performance, excessive reliance on debt should be avoided. Managers are expected to adopt more prudent financing strategies in order to maintain profitability and financial stability. Second, this study provides useful insights for regulators and policymakers regarding the importance of capital structure management in strengthening the resilience of manufacturing firms. Policies that encourage sound financial management, prudent leverage decisions, and greater financial transparency may help firms improve their performance and maintain long-term sustainability. The last, the findings of this study provide useful information for investors and other stakeholders in evaluating firms' financial conditions. Since higher leverage tends to reduce firm performance, investors should pay close attention to capital structure indicators when making investment decisions. This may help them conduct more comprehensive assessments of firms' financial risk and performance prospects.

Expanding the research scope by investigating variables like corporate governance, firm liquidity, operational efficiency, and broader economic factors represents a promising avenue for future research. Doing so would address the current model's low coefficient of determination, thereby providing a more comprehensive and robust framework for evaluating firm performance.

Future studies may also employ alternative data treatment approaches to address distributional problems, so that the analysis can better reflect the original values of the research variables. In this study, Return on Assets (ROA) was transformed into its square root form to satisfy the normality assumption, which may affect the direct interpretation of the results.

In addition, future research is recommended to use more comprehensive measures of business risk, such as earnings volatility, sales variability, or other operational risk indicators, in order to better capture the multidimensional nature of business risk and to re-examine its role as a moderating variable.

## References

1. Agmas W. Impacts of capital structure: profitability of construction companies in Ethiopia. *Journal of Financial Management of Property and Construction*,2020:25(3):371-386. <https://doi.org/10.1108/JFMPC-08-2019-0072>
2. Ahmed AM, Nugraha DP, Hågen I. The relationship between capital structure and firm performance: the moderating role of agency cost. *Risks*,2023:11(6):1-17. <https://doi.org/10.3390/risks11060102>
3. Andrade G, Kaplan SN. How costly is financial (not economic) distress? Evidence from highly leveraged transactions that became distressed. 1998:11(5).
4. Ayalew ZA. Capital structure and profitability: panel data evidence of private banks in Ethiopia. *Cogent Economics and Finance*,2021:9(1):1-24. <https://doi.org/10.1080/23322039.2021.1953736>
5. Badan Pusat Statistik. *Perkembangan Indeks Produksi Industri Manufaktur (Triwulanan) 2020-2024*. Badan Pusat Statistik, 2023. Available from: <https://www.bps.go.id/>
6. Baiq Umayatul Fasihah A. Pengaruh Struktur Modal dan Ukuran Perusahaan Terhadap Kinerja Keuangan Perusahaan Manufaktur yang Terdaftar di BEI (2019-2022). *Pengaruh Penerapan Good Corporate Governance Terhadap Kinerja Keuangan*,2025:6(2):107-116.
7. Bui TN, Nguyen XH, Pham KT. The effect of capital structure on firm value: a study of companies listed on the Vietnamese stock market. *International Journal of Financial Studies*,2023:11(3). <https://doi.org/10.3390/ijfs11030100>
8. Chakraborty I. Capital structure in an emerging stock market: the case of India. *Research in International Business and Finance*,2010:24(3):295-314. <https://doi.org/10.1016/j.ribaf.2010.02.001>
9. Donaldson L. *The Contingency Theory of Organizations*. SAGE Publications, 2014. <https://doi.org/10.4135/9781452229249>
10. Ehrhardt, Brigham. *Financial management*. In *Hospitals*. 2020:44(7).
11. ERIA Studi 2021. *Kajian Sektor Manufaktur Indonesia 2021*.
12. Frank MZ, Goyal VK. Capital structure decisions: which factors are reliably important? *Financial Management*,2009:38(1):1-37. <https://doi.org/10.1111/j.1755-053X.2009.01026.x>
13. Ghozali I. *Aplikasi Analisis Multivariate Dengan Program IBM 25*. 2021:9:490.
14. Harris M, Raviv A. *The Theory of Capital Structure*. XLVI(1), 1991.
15. IRM AP. *Annual Risk Survey*. 2023:1.
16. Isventina I, Nuryartono N, Hutagaol MP. Analisis Daya Saing Sektor Industri Prioritas Indonesia Dalam Menghadapi Pasar Asean. *Jurnal Ekonomi Dan Kebijakan Pembangunan*,2023:45(2):71-93. <https://doi.org/10.29244/jekp.4.1.2015.71-93>
17. Jabar MA, Kufepaksi M, Dalimunthe NP. Pengaruh Manajemen Keluarga, Struktur Kepemilikan Keluarga, Struktur Modal dan Invesment Opportunity Set (IOS) Terhadap Kinerja Perusahaan (Studi pada Perusahaan Manufaktur yang Terdaftar di Bursa Efek Indonesia Periode 2017-2022). *Journal on Education*,2024:6(4):18529-18543. <https://doi.org/10.31004/joe.v6i4.5740>
18. Junieta M, Setyawan IR. Faktor Penentu Struktur Modal Perusahaan Manufaktur di Indonesia. *Jurnal Manajemen Bisnis dan Kewirausahaan*,2022:433-438.
19. Kale JR, Shahrur H. Corporate capital structure and the characteristics of suppliers and customers. *Journal of Financial Economics*,2007:83(2):321-365. <https://doi.org/10.1016/j.jfineco.2005.12.007>
20. Kenny RMB, DAA. The moderator-mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*,1986:51(6):1173-1182.

21. Kraus, Litzenberger. American Finance Association. *The Journal of Finance*,1976:13(1):484-484. <https://doi.org/10.1111/jofi.13000>
22. Masela, Supriandi. Pengaruh Struktur Modal, Profitabilitas, Likuiditas Pasar Terhadap Nilai Perusahaan Pada Industri Manufaktur di Jawa Barat. *2023:01(03):142-152*. <https://doi.org/10.58812/sak.v1.i03>
23. Mehzabin S, Shahriar A, Hoque MN, Wanke P, Azad MAK. The effect of capital structure, operating efficiency and non-interest income on bank profitability: new evidence from Asia. *Asian Journal of Economics and Banking*,2023:7(1):25-44. <https://doi.org/10.1108/AJEB-03-2022-0036>
24. Mulyanto H, Andriyani M. Profitabilitas dalam Memediasi Struktur Modal dan Likuiditas Terhadap Return Saham Perusahaan LQ-45 di Bursa Efek Indonesia. *MASTER: Jurnal Manajemen Strategik Kewirausahaan*,2022:2(2):133-144. <https://doi.org/10.37366/master.v2i2.494>
25. Myers SC, Majluf NS. Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*,1984:13(2):187-221. [https://doi.org/10.1016/0304-405X\(84\)90023-0](https://doi.org/10.1016/0304-405X(84)90023-0)
26. Opler TIMC, Titman S. Financial Distress and Corporate Performance. *XLIX(3)*, 1994:1015-1040.
27. Pham NH, Hoang TM, Pham NTH. The impact of capital structure on bank profitability: evidence from Vietnam. *Cogent Business and Management*,2022:9(1). <https://doi.org/10.1080/23311975.2022.2096263>
28. Putri Harahap, Irdha Yusra. Business Risk in Moderating the Effect of Capital Structure on Financial Performance in Listed Companies in Indonesia. *Santhet (Jurnal Sejarah Pendidikan Dan Humaniora)*,2025:9(1):138-150. <https://doi.org/10.36526/santhet.v9i1.5004>
29. Ritonga SA, Effendi I, Prayudi A. Pengaruh Struktur Modal Terhadap Kinerja Keuangan Perusahaan Consumer Goods di BEI. *Jurnal Ilmiah Manajemen Dan Bisnis (JIMBI)*,2021:2(2):86-95. <https://doi.org/10.31289/jimbi.v2i1.383>
30. Salim M, Yadav R. Capital Structure and Firm Performance: Evidence from Malaysian Listed Companies. *Procedia - Social and Behavioral Sciences*,2012:65(ICIBSoS):156-166. <https://doi.org/10.1016/j.sbspro.2012.11.105>
31. Saputri NS, Agustina L. Pengaruh Moderasi Risiko Bisnis pada Hubungan Struktur Kepemilikan, Struktur Aset, dan Kebijakan Dividen terhadap Kebijakan Hutang. *Nominal Barometer Riset Akuntansi Dan Manajemen*,2023:12(2):150-165. <https://doi.org/10.21831/nominal.v12i2.55521>
32. Sekaran U, Bougie R. Research Methods for Business: A Skill-Building Approach. *Leadership & Organization Development Journal*,2013:34(7). <https://doi.org/10.1108/lodj-06-2013-0079>
33. Sugiyono PD. *Metode Penelitian Kuantitatif & Kualitatif*. 1st ed. Alfa Beta Bandung, 2019.
34. Tesema TN. The effect of capital structure on performance: empirical evidence from manufacturing companies in Ethiopia. *Cogent Economics and Finance*,2024:12(1). <https://doi.org/10.1080/23322039.2023.2300926>
35. Titman S, Wessels R. The Determinants of Capital Structure Choice. *The Journal of Finance*,1988:43(1):1-19. <https://doi.org/10.1111/j.1540-6261.1988.tb02585.x>
36. Wijaya R. Factors Affecting Company Capital Structure with Business Risk as a Moderator. *2024:23(2):181-202*.
37. Yulianti A, Jihadi M, Nurjannah D. The Influence of Company Size, Business Risk, and Sales Growth on Capital Structure Mediated by Profitability. *Jamanika (Jurnal Manajemen Bisnis Dan Kewirausahaan)*,2024:4(2):106-118. <https://doi.org/10.22219/jamanika.v4i2.33636>
38. Zeitun R, Tian G. Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting, Business and Finance Journal*,2007:1(4):40-61.