

The Influence of Strategy Business, Profitability, and Leverage on the Financial Distress of Manufacturing Firm Basic Industry and Chemical Sectors Listed on the Indonesia Stock Exchange (IDX) During the 2021-2024 Period

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ABSTRACT

This study investigates the influence of business strategy, profitability, and leverage on financial distress in manufacturing companies within the Basic Industry and Chemical sector listed on the Indonesia Stock Exchange (IDX) during the 2021–2024 period. The research is motivated by the sector's growing vulnerability to financial pressure caused by post-pandemic economic recovery, global commodity volatility, exchange rate fluctuations, and structural cost challenges. Using a quantitative approach, the study employs purposive sampling to obtain 72 firm-year observations and analyzes secondary financial data sourced from annual reports. Multiple linear regression is utilized to examine the relationships among the selected variables. The findings reveal that profitability has a significant effect on financial distress, indicating that firms with stronger earnings capacity are less likely to experience financial instability. Conversely, business strategy and leverage do not exhibit significant effects, suggesting that short-term financial outcomes in capital-intensive industries may be influenced more by external structural conditions than by strategic positioning or capital structure. The model's explanatory power remains modest, highlighting the multifaceted nature of financial distress. These results contribute to the theoretical understanding of distress predictors and imply that managers need to prioritize operational efficiency and profitability enhancement to strengthen financial resilience.

KEYWORDS: Business Strategy, Profitability, Leverage, Financial Distress, Manufacturing Sector, Altman Z-Score.

1. INTRODUCTION

The manufacturing sector is one of the main pillars of Indonesia's economic structure. Its consistent contribution to the national Gross Domestic Product (GDP) reflects the strategic role of this sector in supporting economic activities, creating employment opportunities, and maintaining industrial stability. According to reports from the Ministry of Industry, Indonesia's manufacturing industry has contributed more than 18% to the national GDP in recent years, making it the largest contributor compared to other sectors. Among the various subsectors, the basic industry and chemical sectors hold a particularly significant position, as they serve as key suppliers of fundamental raw materials for downstream industries such as construction, automotive, textiles, plastics, food processing, and infrastructure development. Given their broad scope and substantial influence on national supply chains, the financial health of companies operating within these sectors plays a crucial role in ensuring economic resilience.

However, between 2021 and 2024, the basic industry and chemical sectors experienced considerable pressure. Post-pandemic economic recovery progressed unevenly, while fluctuations in energy prices, rising global logistics costs, exchange rate volatility, and geopolitical uncertainties imposed additional burdens on production expenses. Moreover, intensifying global competition has compelled companies to implement more efficient and innovative operational strategies to maintain competitiveness. These conditions have collectively increased the likelihood of firms experiencing financial strain or financial distress, a condition that can threaten business continuity if not managed appropriately.

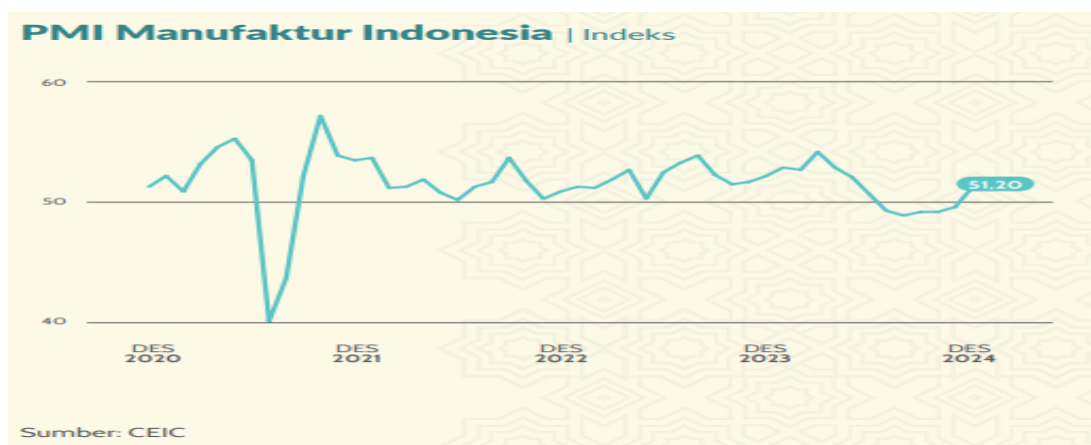
PMI Manufaktur Global | Indeks



Sumber: CEIC

Figure 1. Purchasing Manufacturing Index (PMI) for 2020-2024

Trends in the global and domestic Purchasing Manufacturing Index (PMI) provide a more comprehensive picture of the manufacturing sector's performance during this period. Several major economies recorded prolonged contraction throughout 2023-2024 due to declining external demand and the implementation of tight monetary policies. These developments influenced Indonesia's business climate, given the manufacturing sector's significant reliance on imported raw materials and global market demand. Additionally, the instability of international commodity prices particularly energy and industrial metals exerted further pressure on the basic industry and chemical sectors, which are highly sensitive to input cost fluctuations.



Sumber: CEIC

Figure 2. Indonesia's Purchasing Manufacturing Index (PMI) for 2020-2024

Despite these challenges, Indonesia's PMI showed improvement in 2024, increasing to 51.20 after having been in the contraction zone for six consecutive months. This rise indicates an expansion in manufacturing activities driven by increases in new orders and production output. Although this recovery reflects a positive signal, the volatility of global and domestic economic conditions continues to pose financial risks, especially for firms with weak operational structures and suboptimal financing strategies.

The issue of financial distress has thus become increasingly relevant to examine, as it not only affects the sustainability of individual firms but also has the potential to generate broader economic consequences such as labor reductions, declining investment, supply chain disruptions, and diminished investor confidence. According to Restu, 2024, financial distress refers to a condition wherein a firm experiences a persistent decline in financial performance and becomes unable to meet its financial obligations, eventually leading to bankruptcy if not promptly addressed. In the context of basic industry and chemical companies, this risk becomes even more critical due to the sector's capital-intensive nature, dependence on imported raw materials, and the need for strong operational risk management.

Previous studies have attempted to identify various factors influencing financial distress. Among the variables frequently examined are business strategy, profitability, and leverage. These variables are considered capable of providing insights into a firm's ability to manage operations, generate profits, and fulfill financial obligations. Business strategy plays a central role in shaping a firm's competitive positioning and long-term operational effectiveness. Porter (1997) identifies two primary strategies cost leadership and differentiation. Firms in the basic industry and chemical sectors that implement cost leadership strategies can maximize cost efficiency through resource optimization and productivity enhancement. Meanwhile, differentiation strategies create added value through innovation, product quality, and unique services, enabling firms to maintain higher profit margins. Research by (Luthan et al., 2025) and (Putu et al., 2023) demonstrates that effective business strategies can reduce the likelihood of financial distress because firms become more resilient to market fluctuations and operational pressures. Thus, business strategy plays a significant role in strengthening competitiveness and ensuring financial stability within this sector.

Alongside strategy, profitability is a critical indicator of a firm's financial performance. Firms that consistently generate profit are better equipped to meet financial obligations, finance new investments, and withstand economic uncertainty. Higher profitability also reflects efficient asset management and a healthy income structure. Studies conducted by (Aryati et al., 2023) and (Saputri et al., 2023) conclude that profitability has a negative effect on financial distress, implying that firms with higher profitability face lower risks of experiencing financial difficulties. In the basic industry and chemical sectors where operational costs often fluctuate profit-generating capacity is essential for long-term sustainability. Furthermore, leverage reflects the extent to which a firm uses debt in its capital structure. High leverage indicates a greater burden of financial obligations, increasing the risk of default during periods of economic volatility or declining revenue. Research by (Antoniawati & Purwohandoko, 2022) and (Heniwati & Essen, 2020) finds that high leverage is positively associated with financial distress. In the capital-intensive basic industry and chemical sectors, poorly managed debt structures can weaken financial performance and heighten bankruptcy risk. Therefore, prudent debt management is essential to maintain financial stability.

Considering the dynamic economic environment and structural challenges faced by the basic industry and chemical sectors, examining the influence of business strategy, profitability, and leverage on financial distress becomes highly relevant. This study aims to provide empirical evidence on these relationships within companies listed in the Indonesia Stock Exchange. By understanding the key factors contributing to financial distress, firms can design more effective risk-mitigation strategies, while investors and regulators may utilize the findings to assess corporate financial health more comprehensively.

2. LITERATURE REVIEW

2.1. Theory

To strengthen, support, and achieve more robust and comprehensive research findings, this study on manufactory companies listed on the Indonesia Stock Exchange (IDX) draws upon several grand theories, as follows:

2.1.1. Signaling Theory

Signaling theory asserts that firms provide information to external parties as a signal of their performance and future prospects (Spence, 1973). Such information is essential for reducing information asymmetry between management and investors. When a company demonstrates strong performance and maintains a healthy financial condition, management tends to convey positive signals through financial reports, operational strategies, and business decisions to attract market confidence. Conversely, when a firm faces potential financial difficulties, negative signals are more likely to emerge and may influence investor perceptions regarding the risk of bankruptcy. Therefore, both financial and strategic signals play a crucial role in shaping market assessments of a firm's likelihood of experiencing financial distress.

2.1.2. Agency Theory

Agency theory explains the relationship between the owners of a company (principals) and its management (agents), highlighting potential conflicts of interest arising from differences in objectives between the two parties (Jensen & Meckling, 1976). Managers often possess greater access to information than shareholders, which may result in actions that do not align with shareholder interests such as excessive debt usage, inefficient asset management, or overly aggressive investment decisions. These behaviors can heighten the risk of financial distress. Effective monitoring mechanisms, sound corporate governance, and appropriate financial policies are necessary to mitigate agency conflicts and maintain financial stability.

2.2. Research Hypothesis

A hypothesis is an unproven proposition or assumption temporarily adopted to explain certain facts or phenomena, serving as a tentative answer to the research problem (Sugiyono, 2020). Based on the background, problem formulation, and the supporting theories related to business strategy, profitability, leverage, and financial distress, the hypotheses proposed in this study are as follows:

2.2.1. Effect of Business Strategy on Financial Distress

Business strategy represents the approach a firm employs to build competitive advantage through either cost leadership or differentiation. An appropriate strategy can enhance operational efficiency, productivity, and market competitiveness, thereby reducing the risk of financial distress. Prior studies indicate that business strategy plays an important role in decreasing the likelihood of corporate distress (Thu, 2023) (Larasati & Mawardi, 2024). With a well-executed strategy, firms are better equipped to withstand industry pressures and sustain positive financial performance.

H1: Business strategy has an effect on financial distress.

2.2.2. Effect of Profitability on Financial Distress

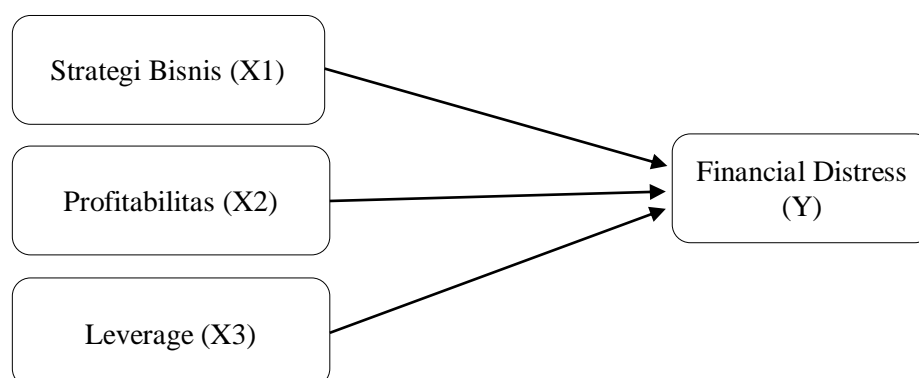
Profitability reflects a firm's ability to generate earnings from its operational activities. Higher profitability demonstrates stronger financial health, which improves a firm's capacity to meet both short-term and long-term obligations. Empirical studies have shown a negative and significant relationship between profitability and financial distress (Saputri et al., 2023) Wardani et al., (2024). Thus, the higher the profitability of a firm, the lower the likelihood that it will encounter financial distress.

H2: Profitability has an effect on financial distress.

2.2.3. Effect of Leverage on Financial Distress

Leverage illustrates the proportion of a firm's funding that originates from debt. High leverage increases a firm's obligations related to interest and principal repayments, thereby elevating the risk of default and intensifying the potential for financial distress. Previous research has demonstrated that leverage exerts a positive and significant influence on financial distress (Heniwati & Essen, 2020) (Antoniawati & Purwohandoko, 2022). Therefore, the greater the leverage burden, the higher the probability that a firm will face financial pressure.

H3: Leverage has an effect on financial distress.



3. RESEARCH METHODS

3.1. Research Design

This research uses a quantitative approach with descriptive and analytical methods. The study aims to examine the effects of business strategy, profitability, and leverage on financial distress in manufacturing companies in the Basic Industry and Chemical sector listed on the Indonesia Stock Exchange (IDX) during the period 2021-2024. This research employs multiple linear regression analysis to test the proposed hypotheses. The analysis is conducted using statistical software SPSS version 30.

3.2. Population and Sample

The population in this study consists of all manufacturing companies in the Basic Industry and Chemical sector listed on the Indonesia Stock Exchange (IDX) during the period 2021-2024. The research sample was selected using purposive sampling techniques, with specific criteria established as follows:

Table 1. Detailed Calculation of Sample Selection Criteria

No	Company Identification	Outside Criteria	Meets Criteria
1	Basic Industry and Chemical sector companies listed on IDX during 2021-2024	-	260
2	Companies that do not use Indonesian Rupiah (IDR) as reporting currency	-60	200
3	Companies experiencing losses (do not report positive EBIT in 2021-2024)	-32	168
4	Companies that do not publish Annual Reports completely during 2021-2024	-96	72
Total Research Sample			72

Source: Secondary data processed by the researcher (2025)

3.3. Data Collection Techniques

The data used in this study is secondary data obtained from annual financial reports published by companies listed on the IDX available at www.idx.co.id and the official websites of the respective companies. The collected data includes financial distress indicators, business strategy, profitability, and leverage. The data is analyzed using statistical software SPSS version 30 to test the proposed hypotheses. Therefore, the multiple linear regression equation developed specifically for this study, reflecting the hypothesized relationships among the selected variables, is formally presented as follows:

$$FD_{i,t} = \alpha + \beta_1 SB_{i,t} + \beta_2 ROA_{i,t} + \beta_3 DAR_{i,t} + e_{i,t}$$

Table 2. Indicators for Research Variable Measurement

Research Variable	Description	Measurement Indicator
Business Strategy (SB)	Measured using the ratio of Selling, General and Administrative Expenses (SGA) to Sales, which represents efficiency strategy adopted by the company to minimize production and operational cost Astuti et al. (2023).	$SGAS = \frac{SGA}{Penjualan} \times 100\%$
Profitability (ROA)	Measures the company's ability to generate net income from total assets owned. A higher ROA indicates better financial performance Khotimah et al. (2025).	$ROA = \frac{Laba Bersih}{Total Aset} \times 100\%$
Leverage (DAR)	Measured as the proportion of total liabilities to total assets, indicating how much company assets are financed through debt (Aisyah & Mulyani, 2024).	$DAR = \frac{Total Liabilities}{Total Aset} \times 100\%$
Financial Distress (Y)	Financial distress is measured using the Altman Z-Score model to assess the probability of bankruptcy through a combination of financial ratios (Altman, 1968) (Larasati & Mawardi, 2024).	$Z = 6,56 \frac{Networking\ capital}{Total\ Assets} + 3,26 \frac{Accum.\ retained\ earnings}{Total\ Assets} + 1,05 \frac{EBIT}{Total\ Assets} + 6,72 \frac{Book\ value\ of\ equity}{Total\ liabilities}$

4. RESEARCH RESULTS AND DISCUSSION

The object of this study is a panel of manufacturing firms in the Basic Industry and Chemical sector listed on the Indonesia Stock Exchange (IDX) during the 2021-2024 period. The total of 260 observations represents four years of data drawn from 65 firms. Based on the sample selection criteria determined through purposive sampling, 60 observations were excluded because the firms did not use the Indonesian rupiah as their reporting currency, 32 observations were excluded because the firms did not report positive EBIT during the 2021-2024 period, and 96 observations were removed due to incomplete annual report disclosures. Consequently, the final research sample consists of 72 valid firm-year observations.

Following sample refinement, the descriptive statistical analysis was conducted to examine the distribution and characteristics of each variable. The descriptive results provide an overview of the minimum, maximum, mean, and standard deviation values, enabling a clearer understanding of the variability in business strategy, profitability, leverage, and financial distress across the sampled firms. These descriptive insights form the basis for interpreting the subsequent regression outcomes.

Table 3. Descriptive Statistical Test

	N	Minimum	Maximum	Mean	Std. Deviation
Strategi Bisnis	72	0,042	0,325	0,10735	0,059568
Profitabilitas	72	0,002	0,364	0,06638	0,063666
Leverage	72	0,079	0,616	0,35226	0,147825
Financial Distress	72	5,2	85,14	21,30931	18,459824
Valid N (listwise)	72				

Source: Secondary data processed with SPSS 30, 2025

Based on the descriptive statistical results, the business strategy variable recorded a minimum value of 0.042 and a maximum value of 0.325, with an average of 0.10735 and a standard deviation of 0.059568. This indicates that most firms apply relatively efficient operational strategies, although the variation suggests differences in how intensely companies adopt cost-oriented approaches. The profitability variable showed a minimum value of 0.002 and a maximum value of 0.364, with an average of 0.06638 and a standard deviation of 0.063666. These results reflect generally low profitability among firms in the Basic Industry and Chemical sector during the observed period. The leverage variable exhibited a minimum value of 0.079 and a maximum value of 0.616, with an average of 0.35226 and a standard deviation of 0.147825. This suggests that many firms utilize moderate to relatively high levels of debt, which may increase financial risk under unstable economic conditions. Financial distress, measured using the Altman Z-Score, showed a minimum value of 5.20 and a maximum value of 85.14, with an average of 21.30931 and a standard deviation of 18.459824. The wide spread indicates that while some firms are financially stable, others face a high probability of distress.

Table 4. Classical Assumption Test

Variable	Normality Test	Multicollinearity Test		Heteroscedasticity Test	Autocorrelation Test
		Tolerance	VIF		
Strategi Bisnis		0.104	9.631	0.259	
Profitabilitas	0.075	0.979	1.201	0.249	0.281
Leverage		0.103	9.688	0.439	

Dependent Variable: Financial Distress

Source: Secondary data processed with SPSS 30, 2025

The diagnostic tests were conducted to ensure that the regression model satisfies the classical assumption requirements. The normality test for the business strategy variable yielded a significance value of 0.075, which exceeds the 0.05 threshold, indicating that the residuals follow an acceptable distribution. Although the normality test is not mandatory in large samples, the result confirms that the model's residual behavior does not exhibit substantial deviation. The multicollinearity assessment shows that profitability has a tolerance value of 0.979 and a VIF of 1.201, indicating the absence of collinearity. Meanwhile, business strategy and leverage report lower tolerance values (0.104 and 0.103) and higher VIF values (9.631 and 9.688). While these VIF values are elevated,

they remain below the upper threshold commonly referenced in econometric literature ($VIF < 10$), suggesting that multicollinearity is tolerable and does not compromise the stability of coefficient estimates. Heteroscedasticity results indicate significance values above 0.05 for all variables, suggesting homoscedastic residuals and supporting the reliability of the standard error estimates. Furthermore, the autocorrelation test value of 0.281 confirms the absence of serial correlation in the residuals, which strengthens the validity of the regression estimation. Overall, the diagnostic results demonstrate that the regression model meets the principal classical assumption criteria and is deemed appropriate for subsequent hypothesis testing.

Table 5. Regression Coefficient

Variable	B	Std. Error	t	Sig.
Constant	0.069	1.574	0.044	0.965
Strategi Bisnis	-6.172	7.213	-0.856	0.395
Profitabilitas	54.084	24.807	2.180	0.033
Leverage	6.292	7.087	0.888	0.378

Dependent Variable : Financial Distress

Source: Secondary data processed with SPSS 30, 2025

Table 5 presents the estimation results of the multiple regression model used to examine the influence of business strategy, profitability, and leverage on financial distress. The constant value of 0.069 indicates that, in the absence of the independent variables, the baseline level of financial distress remains low. The coefficient for business strategy is -6.172 with a t-value of -0.856 and a significance level of 0.395. Although the negative sign aligns with theoretical expectations suggesting that more efficient strategic practices may help reduce financial pressure the effect is statistically insignificant. This result implies that variations in strategic efficiency across firms do not generate a measurable impact on financial distress within the observed period. Profitability shows a statistically significant positive effect on financial distress, with a coefficient of 54.084 ($t = 2.180$; $\text{Sig.} = 0.033$). A higher profitability level is associated with lower financial distress risk, confirming that firms with stronger earnings capacity are better equipped to meet obligations and maintain financial stability. This finding supports the theoretical argument that profitability serves as a buffer against insolvency risk. Leverage demonstrates a positive but insignificant coefficient of 6.292 ($t = 0.888$; $\text{Sig.} = 0.378$). Although higher leverage is generally associated with increased financial vulnerability, the statistical insignificance suggests that the level of indebtedness among sampled firms has not yet reached a point where it materially affects their financial distress scores. Overall, the regression results indicate that profitability is the sole variable with a significant influence on financial distress, whereas business strategy and leverage, despite their expected directional relationships, do not exert statistically meaningful effects under the observed conditions.

Table 6. Hypothesis Test

Variable	T-Test		F-Test		R ² -Test
	t	Sig.	F	Sig.	R ²
Constant	0.044	0.965			
Strategi Bisnis	-0.856	0.395	1.831	0.150	0.076
Profitabilitas	2.180	0.033			
Leverage	0.888	0.378			

Dependent Variable: Financial Distress

Source: Secondary data processed with SPSS 30, 2025

The t-test results show that profitability is the only variable exerting a statistically significant effect on financial distress, with a t-value of 2.180 and a significance level of 0.033. This indicates that firms with higher profitability tend to face lower financial distress, reinforcing the notion that earnings performance strengthens financial resilience. In contrast, business strategy ($t = -0.856$; $\text{Sig.} = 0.395$) and leverage ($t = 0.888$; $\text{Sig.} = 0.378$) do not demonstrate significant explanatory power. Although their coefficients align with theoretical expectations regarding financial risk, the statistical evidence does not support their direct influence on financial distress within the observed period. The F-test yields a value of 1.831 with a significance level of 0.150, suggesting that business strategy, profitability, and leverage collectively do not provide a statistically significant explanation of financial distress. This result implies that additional factors beyond the tested variables may be required to capture a more

comprehensive representation of financial vulnerability. Meanwhile, the model's R^2 value of 0.076 indicates that only 7.6% of the variation in financial distress is explained by the independent variables. Although modest, this value reflects the multifaceted nature of financial distress, which is often influenced by a broader set of operational, market, and governance determinants. Taken together, the hypothesis testing results highlight that profitability remains the primary determinant of financial distress in the sampled firms, while business strategy and leverage do not exhibit a measurable impact under the observed conditions.

Discussion

The findings of this study extend the understanding of financial distress determinants within the Basic Industry and Chemical sector by integrating empirical outcomes with relevant theoretical perspectives and prior research. The regression results indicate that profitability is the only variable with a significant effect on financial distress, whereas business strategy and leverage do not exhibit statistical influence. Interpreting these results through Signaling Theory, Agency Theory, and Porter's competitive strategy framework reveals several important insights. The insignificant effect of business strategy contrasts with the theoretical expectation that cost leadership or differentiation strategies should enhance firms' operational resilience and reduce exposure to financial distress (Porter, 1997). Empirical studies such as Luthan et al. (2025) and Larasati & Mawardi (2024) also highlight the role of strategic positioning in improving firms' risk profiles. However, the absence of significance in this study may reflect structural conditions within the Basic Industry and Chemical sector such as volatile raw material prices, high capital intensity, and reliance on imported inputs that dilute the short-term financial benefits of strategic implementation. This suggests that the strategic advantages proposed by theory may require longer time horizons to manifest in measurable financial outcomes.

Profitability demonstrates a significant positive association with financial stability, consistent with Signaling Theory (Spence, 1973). As emphasized by Aryati et al. (2023) and Saputri et al. (2023), profitability provides a credible signal of operational strength and earnings capacity, reducing perceived bankruptcy risk among external stakeholders. The findings of this study reinforce this argument and confirm that firms with stronger earnings performance possess a greater buffer against operational shocks and macroeconomic fluctuations, making profitability a central predictor of distress likelihood. Leverage, though positively associated with financial distress, does not show a significant impact. Prior research (Heniwati & Essen, 2020; Antoniawati & Purwohandoko, 2022) emphasizes the risk-enhancing nature of excessive debt due to increased interest obligations. However, the nonsignificant effect observed here suggests that firms may maintain debt within manageable thresholds or benefit from effective creditor oversight, mitigating agency conflicts as described in Agency Theory (Jensen & Meckling, 1976). It is also plausible that leverage exerts a delayed effect on distress or interacts with unobserved moderating variables not included in this model.

The F-test and low R^2 value (0.076) further demonstrate that business strategy, profitability, and leverage jointly contribute only modest explanatory power. This supports arguments in Restu (2024) that financial distress is a multifactorial phenomenon shaped by external market dynamics, internal governance quality, and industry-specific risks. The sectoral context described in the background post-pandemic recovery, global commodity price fluctuations, and exchange rate volatility reinforces the importance of considering broader macroeconomic and operational indicators.

Taken together, the findings highlight that profitability remains the most robust predictor of financial distress, consistent with theoretical and empirical expectations. By contrast, the insignificant effects of business strategy and leverage suggest that the sector's structural environment may overshadow firm-level decision-making in the short term. Future research should incorporate variables such as liquidity, cash flow adequacy, corporate governance practices, or ESG performance to enhance model explanatory power and refine predictions of financial distress in capital-intensive industries.

5. CONCLUSION

This study investigates the influence of business strategy, profitability, and leverage on financial distress among manufacturing firms in the Basic Industry and Chemical sector of the Indonesia Stock Exchange during 2021-2024. The findings reveal that profitability is the only variable with a significant effect on financial distress, reinforcing the notion that strong earnings performance remains the most reliable indicator of financial resilience. By contrast, business strategy and leverage do not exhibit significant explanatory power, suggesting that strategic positioning and capital structure decisions may not generate immediate or observable financial outcomes in this sector. The results provide meaningful theoretical contributions. First, the significant effect of profitability supports Signaling Theory, which posits that strong financial performance functions as a credible signal of firm stability to external stakeholders. Second, the non-significant effect of leverage refines Agency Theory by

illustrating that debt does not necessarily elevate distress risk when firms maintain prudent debt levels or when creditor monitoring is effective. Third, the insignificant role of business strategy suggests that Porter's competitive typologies may have limited short-term financial impact in industries characterized by high-cost volatility and capital intensity, thereby revealing contextual boundaries in which strategic frameworks operate.

From a managerial standpoint, the results highlight the need for firms to strengthen earnings capacity through improved operational efficiency, margin enhancement, and cost discipline. Managers should acknowledge that while business strategy is crucial for long-term competitive positioning, its financial impact may not materialize quickly under structural constraints. Likewise, firms must continue to employ cautious leverage policies, even though leverage did not exhibit a significant effect in this study, as financial vulnerability may emerge over longer horizons. Despite its contributions, this study is subject to several limitations. The use of secondary financial data may not fully capture qualitative strategic decisions or governance practices that influence distress risk. The model includes only three predictors, which limits explanatory breadth. The study period coincides with post-pandemic adjustment and macroeconomic volatility, potentially affecting generalizability. Moreover, the Altman Z-Score, while widely validated, assesses distress primarily through financial ratios and may omit operational or market-based dimensions.

Future studies are encouraged to incorporate additional predictors such as liquidity, operating cash flows, governance quality, market valuation indicators, or ESG performance. Exploring moderating variables such as firm size or industry concentration may also yield deeper insights. Methodologically, applying panel data estimation, logistic regression, or machine-learning techniques could enhance predictive accuracy. Extending the analysis across sectors or over longer time horizons would further strengthen external validity and advance the understanding of distress dynamics in capital-intensive industries. Collectively, these findings deepen the theoretical and empirical understanding of financial distress and offer a foundation for developing more resilient strategic and financial policies in emerging-market manufacturing firms.

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