

Research Article

The Effect of Leverage on Financial Performance with Financial Distress Risk as a Moderating Variable in Oil, Gas, and Coal Sub-sector Companies Listed on the Indonesia Stock Exchange for the 2020–2023 Period

Nesa Delfi Eftasari^{1*}, Susi Sarumpaet²

¹Universitas Lampung, Indonesia; e-mail : nesasari38@gmail.com

²Universitas Lampung, Indonesia; e-mail : susi.sarumpaet@gmail.com

*Corresponding Author : Nesa Delfi Eftasari

Abstract: This study aims to determine the effect of leverage on financial performance and the effect of financial distress risk on the relationship between leverage and financial performance. The population in this study is several oil, gas, & coal sub-sector companies listed on the Indonesia Stock Exchange in 2020, 2021, 2022, and 2023. This study uses secondary data. The sampling technique uses the simple purposive sampling method, resulting in 57 companies as samples for 4 years. This study uses Moderated Regression Analysis as the data analysis technique. The results of the study show that leverage has a negative effect on financial performance, and financial distress risk is able to strengthen the relationship between leverage and financial performance.

Keywords: Leverage, financial performance, financial distress risk

1. Introduction

Capital structure decisions are one of the elements that can affect financial performance through the cost of capital in funding decisions (Kalash, 2023). Decisions regarding capital structure can have a significant impact on financial performance and the risks faced by a company. **Leverage**, which means using debt to increase potential profit, plays a key role in this strategy. According to Ehrhardt and Brigham (2011), leverage is a ratio that measures the extent to which a company relies on debt to finance its operations compared to its own capital or assets. When a company has a high level of leverage, it indicates that the proportion of debt is greater in its funding structure (Nilai et al., 2013).

According to Ikpesu et al. (2019), the use of leverage in capital structure has a direct impact on a company's financial performance to assess how well the company manages its financial activities based on proper rules and principles. If a company's debt exceeds its assets or income, the company will have difficulty meeting its financial obligations in the future (Brigham & Houston, 2009). Too much debt will result in high interest burdens, which can reduce net profit and ultimately harm the company's financial performance (Ramadhan, 2019).

The issue of leverage becomes increasingly important when linked to the dynamics of the energy industry. The energy sector plays a vital role in a country's economy. The energy generation process is carried out by utilizing various resources, both non-renewable—such as coal, lignite, petroleum, and natural gas—and renewable. Government policies that encourage the development of New and Renewable Energy (EBT) and the reduction of dependence on fossil fuels have created an urgent need for energy companies to shift their operational focus. Based on data from the Geological Agency of the Ministry of Energy and Mineral Resources (ESDM) in 2020, as stated in the 2021–2045 Road Map for Coal Development and Utilization,

Received: May 30, 2025

Revised: June 11, 2025

Accepted: June 24, 2025

Published: June 26, 2025

Curr. Ver.: June 26, 2025



Copyright: © 2025 by the authors.

Submitted for possible open

access publication under the

terms and conditions of the

Creative Commons Attribution

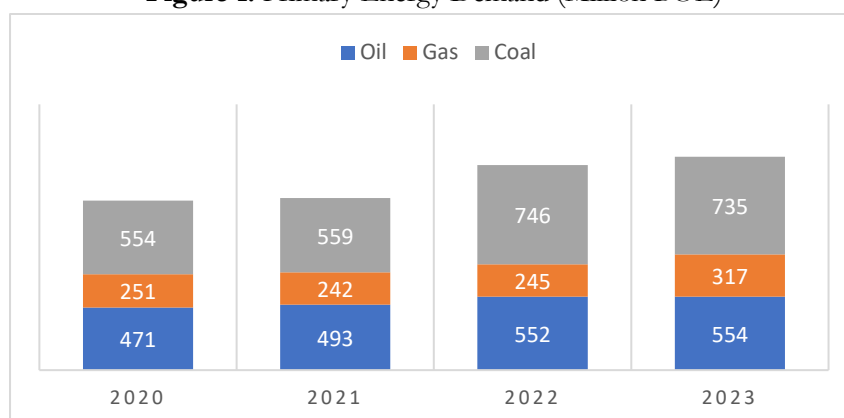
(CC BY SA) license

([https://creativecommons.org/li](https://creativecommons.org/licenses/by-sa/4.0/)

[censes/by-sa/4.0/](https://creativecommons.org/licenses/by-sa/4.0/))

Indonesia has the largest coal reserves in the Asia-Pacific region and is one of the largest coal-producing countries in the world.

Figure 1. Primary Energy Demand (Million BOE)



Source: *Handbook Of Energy & Economic Statistics Of Indonesia* (HEESI), 2024

According to the *Handbook of Energy & Economic Statistics of Indonesia* (HEESI, 2024), the graph of Indonesia's primary energy demand from 2020 to 2023 shows a significant upward trend in energy consumption, especially in oil, gas, and coal sources. This increase reflects the high national energy demand, which directly encourages companies in the oil, gas, and coal sectors to continuously expand their operational capacity. This condition requires substantial financing needs, causing energy companies to tend to rely on leverage or debt to fund their investment activities. On the other hand, the graph also shows that coal remains the dominant energy source, indicating a high dependency on fossil energy. This dependency poses future financial pressure risks, considering global commitments and national policies to reduce carbon emissions and transition toward renewable energy.

Based on data obtained from *Statista Research* (2024), the debt performance of entities in the energy sector during the 2020–2023 period experienced instability. This is shown by the average leverage of PT Buana Lintas Lautan Tbk., which was 0.6 in 2020, increased to 0.8 in 2021, and then decreased to 0.7 in 2022 and 2023. Meanwhile, the average leverage of PT Logindo Samudramakmur Tbk. remained at 0.7 in 2020 and 2021, then increased to 0.8 in 2022 and 2023. Similarly, PT Indah Prakasa Sentosa Tbk. experienced a consistent increase in leverage over four consecutive years, from 0.7 in 2020, rising to 0.8 in 2021, and reaching 0.9 in both 2022 and 2023. Furthermore, PT Capitalinc Investment Tbk. and PT Eksploitasi Energi Indonesia Tbk. had leverage values exceeding 1. Based on the financial statements of energy sector entities, the average leverage exceeded 0.5, indicating that these entities had a higher proportion of debt compared to equity.

The sharp increase in debt implies a greater financial burden for entities to meet their obligations (Endri et al., 2021). A high level of leverage is associated with high risk, where most entities use debt to finance operations, asset purchases, investments, and business development (Susanti et al., 2022). According to Waqas & Md-Rus (2018), high leverage can worsen the financial condition of companies experiencing financial distress. In this context, an increase in debt can harm the company's financial performance due to the growing burden of debt costs. If this condition persists without structural improvements or financial support, the risk of bankruptcy will increase significantly and become difficult to avoid. Therefore, the relationship between leverage and financial performance cannot be viewed simply and depends on the financial condition and bankruptcy risk faced by the company.

2. Literature Review

2.1. Trade Off Teori

The Trade-Off Theory was first introduced in the context of capital structure by economists Modigliani and Miller (1958). This theory was later developed in the early 1970s, focusing on the balance between the tax benefits of debt use (tax shield) and bankruptcy costs. This theory argues that companies can achieve an optimal capital structure by balancing the tax advantages of interest on debt with the risk of bankruptcy and other financial costs. An increase in debt can also raise the risk of bankruptcy (Abate, 2023). Companies will choose between holding a certain amount of cash or using the cash for investments that potentially generate profits for the company (Wirianata et al., 2023). The Trade-Off Theory indicates that a company cannot continuously increase its value by raising debt in its capital structure.

2.2. Financial Performance

Financial performance describes the achievements attained by a company in managing its assets efficiently over a specific period. According to Elliott (2009), financial performance is the profit earned by a company from the resources it manages. Several indicators used to measure company performance include the Return on Assets (ROA), Return on Equity (ROE), and Return on Investment (ROI) approaches. This study uses Return on Assets (ROA) as a profitability ratio analysis to measure financial performance. This ratio indicates the efficiency of capital use in relation to asset ownership to generate profits (Panjaitan R. J., 2018). ROA assesses a company's efficiency in generating profit from its total assets, not just from shareholders' equity.

2.3. Leverage

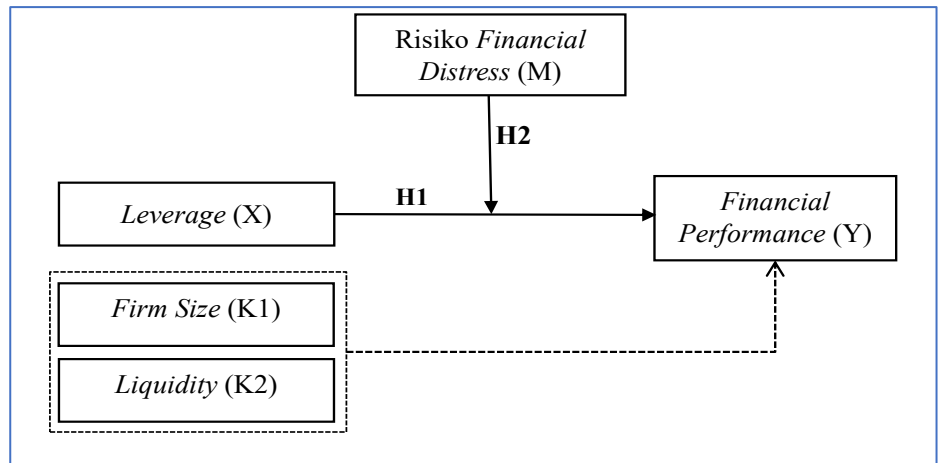
According to Munawir (2010), the leverage ratio is a ratio used to measure the extent to which a company's assets are financed by debt. A high level of leverage indicates that the risk faced by the company is greater, as most of its assets are financed through debt. This increases the potential financial risk for the company. According to Oktani & Benarda (2024), although debt financing can support expansion and investment, a high dependence on debt is feared to increase financial risk. High reliance on debt can lead to significant interest expenses, which must be paid regardless of business performance. If the company's revenue is insufficient to cover debt costs such as interest and principal payments, the risk of bankruptcy will increase (Mas'ud & Srengga, 2015).

2.4. Financial Distress Risk

Financial distress risk refers to a condition in which a company experiences financial difficulties that can have adverse effects, potentially leading to bankruptcy (Kalash, 2023). Bankruptcy is a situation where a company faces severe financial pressure. This condition represents the final stage of financial instability caused by the management's failure to resolve financial problems. The process leading to bankruptcy typically begins with short-term financial issues..

2.5. Hypothesis Development

Figure 2. Conceptual Framework



According to Munawir (2010), the leverage ratio is a ratio used to measure the extent to which a company's assets are financed by debt. High leverage often limits a company's ability to seize new profitable investment opportunities. Based on studies by Nur Amalia (2021) and Dana et al. (2021), leverage has a negative and significant effect on financial performance. Furthermore, Kalash (2023) adds that high leverage, especially in high-risk sectors, is often correlated with declining financial performance. Empirical research by Le & Phan (2017) supports this view, showing that companies with high leverage levels tend to be more vulnerable to default risk. This risk tends to increase, particularly in companies facing market volatility or economic pressure.

H₁: Leverage has a negative effect on financial performance.

Companies experiencing financial distress are at greater risk of incurring substantial losses and facing bankruptcy. Research by Waqas & Md-Rus (2018) found that companies with high leverage and in financial distress conditions face a greater risk of declining financial performance. In such situations, companies are often forced to prioritize debt repayment over allocating resources to productive operational activities or profitable business development. This financial pressure not only reduces the company's operational flexibility but also increases the risk of default, which in turn can further deteriorate overall financial performance.

H₂: Financial distress risk strengthens the effect of leverage on financial performance.

3. Proposed Method

3.1 Population and Sample

3.2 The population in this study includes all companies categorized under the oil, gas, and coal sub-sector listed on the Indonesia Stock Exchange (IDX) during the period from 2020 to 2023. The sampling technique used is **simple purposive sampling**, which involves selecting samples based on specific criteria aligned with the research objectives. Based on this method, a total of 57 companies were selected as research samples over a four-year period. This study uses **unbalanced panel data**, a condition in which the cross-sectional units have an unequal number of time series observations.

3.3 Research Variables

3.2.1 Dependent Variable

The comparison between net income after tax and total assets. The higher the ROA value, the more it indicates that the company is able to generate profit from its owned capital (Abdullah & Tursoy, 2021).

$$ROA = \frac{Net\ Profits}{Total\ Asset}$$

3.2.2 Independent Variable

A high proportion of debt compared to assets indicates that the company relies more on debt to finance its operations used to generate profit for the company. (Abdullah & Tursoy, 2021).

$$DAR = \frac{Total\ Debts}{Total\ Assets}$$

3.2.3 Moderating Variable

The Z-Score is a statistical model developed by Edward Altman in 1968 to predict the likelihood of a company's bankruptcy. This model combines several financial ratios to produce a single figure that reflects

$$Rumus\ Z-Score : \quad 6,56 \text{ (working capital/total assets)} + 3,26 \text{ (retained earnings/total assets)} + 6,72 \text{ (earnings before interest and taxes/total assets)} + 1,05 \text{ (book value of equity/ book value total liability)}$$

the company's financial health. (Elliott, 2009).

The Z-Score value is classified using a dummy variable, with the condition that if the Z-Score is less than 2.90, it is assigned a value of 1, and if the Z-Score is greater than 2.90, it is assigned a value of 0 (Kalash, 2023).

3.2.4 Control Variable

The causal relationship between the independent and dependent variables is controlled by control variables, making the resulting empirical model more robust (Vithessonthi & Tongurai, 2015). The purpose of using control variables is to limit and reduce the influence of other factors on the relationship between the independent and dependent variables.

a. Firm size

Large-scale companies tend to present a strong operational image, where profit generation and strategy implementation are considered successful in developing the company, thus often becoming the focus of institutional investors. (Le & Phan, 2017).

$$\text{Size} = \text{Ln} (\text{Total Asset})$$

b. Likuiditas

Liquidity describes a company's ability to effectively use its assets to meet short-term obligations. (Le & Phan, 2017).

$$\text{Liq} = \frac{\text{Cash}}{\text{Total Assets}}$$

4. Results

4.1 Statistic Descriptive

Table 1. Statistic Descriptive

| | Minimum | Maximum | Mean | Std. Deviation |
|--------------------|---------|---------|---------|----------------|
| ROA (Y) | -.62 | .62 | .0872 | .15747 |
| Leverage (X) | .00 | 4.90 | .5719 | .46651 |
| Firm Size (K1) | 13.00 | 29.00 | 21.2232 | 3.93036 |
| Liquidity (K2) | .00 | 1.47 | .1408 | .15947 |
| Z_Dummy (M) | .00 | 1.00 | .5089 | .50104 |
| Valid N (listwise) | | | | |

Source: Processed data with SPSS, 2025

The results of the descriptive analysis on the sample of oil, gas, and coal sub-sector companies show that the Return on Assets (ROA) variable has a minimum value of -0.62 and a maximum value of 0.62, with a mean of 0.0872 and a standard deviation of 0.15747, indicating a high level of data dispersion as the standard deviation exceeds the mean. The leverage variable (DAR) has a minimum value of 0.00 and a maximum value of 4.90, with a mean of 0.5719 and a standard deviation of 0.46651, indicating low data dispersion. Firm Size shows a minimum value of 13.00 and a maximum value of 29.00, with a mean of 21.2232 and a standard deviation of 3.93036, also reflecting low data dispersion. The liquidity variable has a minimum value of 0.00 and a maximum value of 1.47, with a mean of 0.1408 and a standard deviation of 0.15947, indicating high data dispersion as the standard deviation exceeds the mean. Meanwhile, the dummy variable for financial distress (Z_Dummy), based on the Altman Z-score, has a mean of 0.5089 and a standard deviation of 0.50104, indicating that,

in general, companies fall within the grey zone category with a low level of data dispersion.

4.2 Hypothesis Testing (Moderated Regression Analysis)

4.2.1 Determination Coefficient Test

The coefficient of determination ranges between 0 and 1. A low R^2 value indicates that the independent variables have a very limited ability to explain the variation in the dependent variable. (Gujarati, 2003).

Tabel 2. Determination Coefficient Test

| Model | R | R Square | Adjusted R Square | Std. Error |
|-------|------|----------|-------------------|------------|
| 1 | .604 | .365 | .350 | .12695 |

Source: Processed data with SPSS, 2025

The coefficient of determination is 0.350. This value indicates that the variables leverage, firm size, liquidity, Z_Dummy, and LevZ_Dummy contribute to explaining 35% of the variation in the dependent variable, namely return on assets, while the remaining 65% is explained by other factors not discussed in this study.

4.2.2 Simultaneous Test (F Test)

The basis for decision-making according to Gujarati (2003) is that if the p-value < 0.05 , then the model is considered feasible for further analysis. Conversely, if the p-value ≥ 0.05 , the model is considered not feasible for analysis.

Table 3. Simultaneous Test (F Test)

| Model | F | Significance Value |
|--------------|--------|--------------------|
| 1 Regression | 25.019 | .000 |

Source: Processed data with SPSS, 2025

The significance value in the table is 0.000. This value is smaller than the significance level of 0.05, indicating that the model is feasible for further analysis. (*goodness of fit*).

4.2.3 Partial Test (t Test)

Based on the significance value and F count, the F test evaluates the concurrent impact of each independent variable on the dependent variable.

Table 4. Partial Test (t-Test)

| Partial Test (t-Test) | | | | | |
|-----------------------|----------------|-----------------------------|--------|--------------------|--------------|
| Model | | Unstandardized Coefficients | t | Significance Value | Results |
| | | B | | | |
| 1 | Constan | .182 | 3.461 | .001 | H1 Supported |
| | Leverage (X) | -.042 | -2.181 | .030 | |
| | Firm Size (K1) | -.002 | -.732 | .465 | |

| | | | | |
|-------------------------|-------|--------|------|--------------|
| Liquidity (K2) | .106 | 1.734 | .084 | |
| Z_Dummy (M) | -.133 | -6.634 | .000 | |
| LevZ_Dummy (XM) | .034 | 2.295 | .023 | H1 Supported |
| Dependent Variable: ROA | | | | |

Source: Processed data with SPSS, 2025

Based on the results of the hypothesis testing using the t-test, the leverage variable (X) shows a significance value of 0.030. This value is smaller than the t-test significance level of 0.05, indicating that the leverage variable (X) has a partial effect on the dependent variable, ROA. Furthermore, the significance value for the moderating variable LevZ_Dummy (XM) is 0.023. This value is also smaller than the t-test significance level of 0.05, indicating that the LevZ_Dummy (XM) variable has a partial effect on the dependent variable, ROA. It can be concluded that the leverage variable (X1) has a significant negative partial effect on the ROA variable (Y), and the LevZ_Dummy (XM) variable has a partial moderating effect on the relationship between leverage and the ROA variable (Y).

5. Discussion

5.1 *Leverage berpengaruh negatif terhadap Financial Performance.*

The results of the study indicate that leverage has a significant negative effect on the financial performance of companies in the oil, gas, and coal sub-sector. This reflects that a capital structure dominated by debt can reduce profitability, especially in capital-intensive industries that rely on external financing for expansion. A high dependence on debt makes companies more vulnerable to financial pressure during commodity price declines or global uncertainty, as interest expenses must still be borne. Therefore, a balanced and adaptive capital structure policy is needed, one that considers external risks and the company's cash flow capacity. These findings are in line with the trade-off theory, which emphasizes the importance of balancing the benefits and risks of debt usage. They are also supported by previous studies such as Le & Phan (2017), Nur Amalia (2021), Dana et al. (2021), and Kalash (2023), who also state that leverage negatively affects financial performance.

5.2 *Financial distress risk strengthens the effect of leverage on financial performance.*

The results of the study show that financial distress moderates the relationship between leverage and financial performance, where a positive interaction coefficient indicates that the negative effect of leverage on financial performance becomes weaker when a company is under financial pressure. This reflects a buffering effect, where companies experiencing financial distress tend to be more cautious and selective in managing their capital structure, adopt more conservative financing decisions, and focus on cost efficiency and risk control. In

the context of the oil, gas, and coal sub-sector in Indonesia—which is highly dependent on commodity price fluctuations and energy policies—these findings indicate that companies have the flexibility to adjust their debt strategies to mitigate the negative impact on financial performance. Support for this finding also comes from the Trade-Off Theory, which explains that companies will balance the tax benefits of debt with the increased risk of bankruptcy when in distress conditions. Accordingly, companies tend to reduce their leverage levels when facing financial pressure in order to avoid further deterioration in performance. These findings are consistent with the studies of Kalash (2023) and Kusuma & Hersugondo (2023), which show that financial distress strengthens the relationship between leverage and financial performance, making it a critical consideration in corporate financing strategies and risk management amid economic uncertainty.

Conclusions

The results of the first hypothesis testing show that leverage has a significant negative effect on financial performance, which means that the higher the proportion of debt in the capital structure, the lower the company's financial performance. This finding is consistent with the theory stating that interest burdens and financial risks resulting from high debt usage can reduce profitability. In the context of manufacturing companies in the energy sub-sector such as oil, gas, and coal, this negative effect is empirically proven to be quite strong, considering the capital-intensive nature of the industry and its heavy reliance on external financing for long-term projects. Furthermore, the results of the second hypothesis testing indicate that financial distress strengthens this negative relationship. In other words, companies under financial pressure become more vulnerable to the adverse impacts of high leverage, as large debt burdens increase the risk of default, reduce liquidity, and hinder the company's ability to maintain profitability.

Limitation

This study has several limitations. The model used was only able to explain approximately 35% of the variation in financial performance, indicating that many other variables have not been included. The study is also limited to oil, gas, and coal sub-sector companies listed on the Indonesia Stock Exchange (IDX), so the results cannot be generalized to other sectors or other developing countries. In addition, the measurement of leverage and financial performance is based solely on accounting data, without considering market-based approaches. Financial distress was also proxied only by the Z-Score; therefore, future studies are recommended to use additional indicators and market-based measurements to enrich the analysis results.

References

- [1] H. Abdullah and T. Tursoy, "Capital structure and firm performance: evidence of Germany under IFRS adoption," *Review of Managerial Science*, vol. 15, no. 2, pp. 379–398, 2021, doi: [10.1007/s11846-019-00344-5](https://doi.org/10.1007/s11846-019-00344-5).
- [2] A. Nur Amalia, "Pengaruh Ukuran Perusahaan, Leverage Dan Struktur Modal Terhadap Kinerja Keuangan," *Jurnal Ilmu dan Riset Manajemen*, vol. 10, no. 5, pp. 1–17, 2021.
- [3] J. D. Atkins, "Exploring the effectiveness of sustainability measurement: which ESG metrics will survive COVID-19?," *Journal of Business Ethics*, 2023.
- [4] E. F. Brigham and J. F. Houston, *Fundamentals of Financial Management*, 12th ed. 2009.
- [5] W. M. Dana, I. N. Kusuma, and P. N. H. Ardianti, "Pengaruh CR, DER, TATO, dan DAR terhadap Kinerja Perusahaan Manufaktur yang Terdaftar di BEI," *Karya Riset Mahasiswa Akuntansi*, vol. 1, no. 1, pp. 30–39, 2021.
- [6] E. Endri et al., "Oil price and leverage for mining sector companies in Indonesia," *International Journal of Energy Economics and Policy*, vol. 11, no. 4, pp. 24–30, 2021, doi: [10.32479/ijeep.11237](https://doi.org/10.32479/ijeep.11237).
- [7] M. C. Ehrhardt and E. F. Brigham, *Financial Management: Theory and Practice*. South-Western, Cengage Learning, 2011.
- [8] B. E. Elliott and J. Elliott, "Financial Accounting," *Financial Accounting and Reporting*, vol. 13, 2009. [Online]. Available: <https://core.ac.uk/download/pdf/33797479.pdf>
- [9] I. Kalash, "The financial leverage–financial performance relationship in the emerging market of Turkey: the role of financial distress risk and currency crisis," *EuroMed Journal of Business*, vol. 18, no. 1, pp. 1–20, 2023, doi: [10.1108/EMJB-04-2021-0056](https://doi.org/10.1108/EMJB-04-2021-0056).
- [10] M. A. Kusuma and Hersugondo, "Peran Financial Distress Risk Sebagai Variabel Moderasi Pada Pengaruh Financial Leverage Terhadap Financial Performance," *Jurnal Bisnis & Kewirausahaan*, vol. 19, no. 1, pp. 61–72, 2023. [Online]. Available: <http://ojs.pnb.ac.id/index.php/JBK>
- [11] T. P. V. Le and T. B. N. Phan, "Capital structure and firm performance: Empirical evidence from a small transition country," *Research in International Business and Finance*, vol. 42, pp. 710–726, 2017, doi: [10.1016/j.ribaf.2017.07.012](https://doi.org/10.1016/j.ribaf.2017.07.012).
- [12] I. Mas'ud and R. M. Srengga, "Financial Ratio Analysis to Predict Financial Distress Condition of Manufacturing Companies Listed on the Indonesia Stock Exchange," *Jurnal Akuntansi Universitas Jember*, vol. 10, no. 2, pp. 139–154, 2015.
- [13] S. Munawir, *Analisis Laporan Keuangan*, 2010.
- [14] T. Nilai, P. Dengan, and S. Modal, "Pengaruh Profitabilitas, Operating Leverage, Likuiditas Terhadap Nilai Perusahaan Dengan Struktur Modal Sebagai Intervening," *Accounting Analysis Journal*, vol. 2, no. 4, pp. 455–463, 2013, doi: [10.15294/aa.v2i4.4172](https://doi.org/10.15294/aa.v2i4.4172).
- [15] N. Oktani and Benarda, "Pengaruh Kebijakan Dividen Kebijakan Hutang dan Profitabilitas Terhadap Nilai Perusahaan," *Jurnal Ilmiah Research and Development Student*, vol. 2, no. 1, pp. 184–198, 2024, doi: [10.59024/jris.v2i1.622](https://doi.org/10.59024/jris.v2i1.622).
- [16] R. J. Panjaitan, "Pengaruh Current Ratio, Debt To Equity Ratio, Net Profit Margin Dan Return on Asset Terhadap Pertumbuhan Laba Pada Perusahaan Consumer Goods Yang Terdaftar Di Bursa Efek Indonesia Periode 2013-2016," *Jurnal Manajemen*, vol. 4, pp. 61–72, 2018.
- [17] A. Ramadhan, "Pengaruh Utang Perusahaan terhadap Kinerja Keuangan (Studi Empiris Perusahaan Yang Terdaftar Di Jakarta Islamic Indeks)," *J. Ilmiah MEA*, vol. 3, no. 2, pp. 16–27, 2019, doi: [10.31955/mea.vol3.iss2.pp](https://doi.org/10.31955/mea.vol3.iss2.pp).
- [18] M. Susanti, S. P. Dewi, S. Sufiyati, and L. Susanto, "The Effect of Sales Growth, Profitability, and Company Size on Leverage," in *Proc. 3rd Tarumanagara Int. Conf. on the Applications of Social Sciences and Humanities (TICASH 2021)*, vol. 655, pp. 660–668, 2022, doi: [10.2991/assehr.k.220404.104](https://doi.org/10.2991/assehr.k.220404.104).
- [19] M. Tesfaye Abate and R. Kaur, "The Evolution of Modern Capital Structure Theory: A Review," *Central European Management Journal*, vol. 31, no. 2, pp. 958–974, 2023, doi: [10.57030/23364890.cemj.31.2.100](https://doi.org/10.57030/23364890.cemj.31.2.100).

- [20] H. Waqas and R. Md-Rus, "Predicting financial distress: Importance of accounting and firm-specific market variables for Pakistan's listed firms," *Cogent Economics and Finance*, vol. 6, no. 1, pp. 1–16, 2018, doi: [10.1080/23322039.2018.1545739](https://doi.org/10.1080/23322039.2018.1545739).
- [21] H. Wirianata, V. Viriany, and I. F. De Mayo, "Corporate Governance In Cash Management, Net Working Capital, And Cash Holding," *Jurnal Akuntansi*, vol. 27, no. 1, pp. 118–135, 2023, doi: [10.24912/ja.v27i1.1246](https://doi.org/10.24912/ja.v27i1.1246).
- [22] F. Ikpesu, O. Vincent, and O. Dakare, "Financial distress overview, determinants, and sustainable remedial measures: Financial distress," in *Corporate Governance Models and Applications in Developing Economies*, Apr. 2019, pp. 102–113, doi: [10.4018/978-1-5225-9607-3.ch006](https://doi.org/10.4018/978-1-5225-9607-3.ch006).