

The Influence of Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) on Profitability in Telecommunications Companies Listed on The Indonesian Stock Exchange (IDX) Period 2021 – 2024

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ABSTRACT

This study analyzes the influence of Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) on the profitability of telecommunications companies listed on the Indonesia Stock Exchange for the 2021-2024 period. The research background is based on the capital-intensive nature of the telecommunications industry and post-pandemic recovery dynamics that require massive infrastructure investments. The research method uses a quantitative approach with explanatory design and panel data regression analysis on four major telecommunications companies. The results indicate that DER and DAR significantly affect profitability, with complex and not always linear relationship patterns. The research findings reveal that the effectiveness of leverage in increasing profitability highly depends on asset utilization efficiency and management's ability to optimize capital structure. The practical implications of this research highlight the importance of appropriate capital structure policies and effective investment strategies in improving the financial performance of telecommunications companies in Indonesia.

INTRODUCTION

The telecommunications industry in Indonesia has emerged as a critical infrastructure sector during the 2021-2024 period, navigating through a complex landscape of post-pandemic economic recovery while simultaneously facing accelerated digital transformation. This period has witnessed unprecedented growth in data demand, rapid 5G technology adoption, and intensifying market competition, creating a compelling research context for examining corporate financial decisions (Nashia dan Pratiwi 2025). The capital-intensive nature of telecommunications operations necessitates substantial investments in network infrastructure and technological upgrades, making capital structure decisions particularly reflected through Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) pivotal determinants of financial performance. The theoretical framework presents contrasting perspectives: the Trade-Off Theory advocates for optimal debt utilization to leverage tax shields and enhance firm value (Modigliani dan Miller 1963), while the Pecking Order Theory suggests that highly profitable firms prefer internal financing over debt (Myers dan Majluf 1984). Empirical evidence from previous studies further complicates this relationship, with previous studies showing a negative effect of DER on profitability, and finding an insignificant relationship between DAR and profitability measures in the Indonesian telecommunication sector.

During the 2021-2024 period, Indonesian telecommunications companies such as Telkom Indonesia (TLKM), Indosat Ooredoo Hutchison (ISAT), XL Axiata (EXCL), and Smartfren (FREN) experienced significant increases in debt levels to finance large-scale investments in 5G infrastructure, data centers, and digital service expansions. This led to an increase in both Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) (Sari dan Anwar 2024). However, profitability as measured through ROA and ROE demonstrated mixed trends. For instance, EXCL and FREN experienced revenue growth but declining ROA, indicating inefficient asset utilization and increased financial burden due to high leverage. On the contrary, TLKM maintained strong profitability despite rising DER, suggesting effective debt management and optimal use of leverage to enhance shareholder returns. This phenomenon reveals that increased leverage does not uniformly translate to higher profitability and highlights the inconsistent relationship between DER, DAR, and profitability within the Indonesian telecommunications sector. This condition reinforces the importance of examining the impact of DER and DAR on profitability for companies listed on the Indonesia Stock Exchange during 2021-2024.

The fundamental research problem addressed in this study concerns how DER and DAR influence the profitability of telecommunications companies listed on the Indonesia Stock Exchange during the 2021-2024 period. This investigation employs DER (total debt to total equity ratio) and DAR (total debt to total assets ratio) as independent variables, while profitability serves as the dependent variable, measured through Return on Assets (ROA) and Return on Equity (ROE) indicators. Several research gaps motivate this inquiry, including temporal limitations of previous studies that predominantly covered pre-pandemic periods, contradictory empirical findings in existing

literature, and methodological constraints in utilizing comprehensive measurement proxies for capital structure. The identified research gaps encompass contextual limitations regarding the unique post-pandemic recovery phase, evidentiary inconsistencies in previous research outcomes, and comprehensiveness issues in capital structure measurement approaches. This study aims to address these gaps by providing contemporary empirical evidence using multiple measurement indicators, thereby contributing to both academic discourse and practical financial management in the Indonesian telecommunications industry. The findings are expected to offer valuable insights for corporate managers in formulating optimal capital structure strategies and for investors in making informed investment decisions within this dynamically evolving sector.

LITERATURE REVIEW

Capital structure is a key determinant in achieving a company's financial performance, especially in capital-intensive industries such as the telecommunications sector. The Indonesian telecommunications industry dominated by major companies like PT Telkom Indonesia Tbk, PT Indosat Tbk, PT XL Axiata Tbk, and several other mid-sized operators has a very high investment need for network infrastructure development, fiber optic deployment, Base Transceiver Station (BTS) expansion, 4G-5G technology development, and network capacity maintenance. This large funding requirement results in telecommunications companies having a relatively higher dependence on external financing, particularly long-term debt (Setiawan dan Febriana 2025). Therefore, an analysis of how leverage ratios such as the Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) affect profitability becomes relevant and strategic, especially in the context of the Indonesian Stock Exchange (IDX) during the post-pandemic period of 2021-2024, when the industry faced structural pressures and increasing expansion needs. The DER depicts the proportion of a company's funding sourced from debt relative to its own equity. A high DER indicates that the company is more aggressive in using debt in its capital structure.

The Trade-Off Theory suggests that using debt can increase profitability up to a certain point due to the tax shield benefit. In the telecommunications industry context, companies often utilize low-interest financing facilities for network infrastructure funding (Ali dan Agustin 2015; Setiawan dan Febriana 2025). Thus, theoretically, an increase in DER could positively impact profitability if the debt-financed investment generates sufficient cash flow to cover the interest expense. However, the Pecking Order Theory posits that profitable companies tend to minimize the use of debt because they prefer internal funding. Consequently, the theories offer contradictory predictions, necessitating a comprehensive empirical test of the relationship between DER and profitability in the telecommunications industry. Most prior empirical research indicates that DER often has a negative relationship with profitability, particularly for telecommunications companies facing high interest burdens and the risk of reduced net income when infrastructure investments do not

immediately generate revenue. Conversely, a number of other studies show that higher leverage can increase ROA or ROE if the company can optimize the economic value of its network assets. This inconsistency suggests that the effect of DER is contextual, depending on company characteristics, operational efficiency, and the level of network asset utilization.

Meanwhile, DAR measures the extent to which a company's assets are financed by debt. Unlike DER, DAR better reflects the level of solvency risk and the sustainability of asset financing. In telecommunications companies, a high DAR value can indicate the company's dependence on debt to finance long-term infrastructure. However, an increase in DAR also has the potential to lower profitability if the majority of debt-financed assets do not generate proportional cash flow (Hidayah dan Faisal 2025; Setiawan dan Febriana 2025). Theoretically, the effect of DAR on profitability can be negative, as a larger proportion of debt to assets leads to higher financial costs and distress risk, which ultimately burdens the company's profit. In the context of the IDX during the 2021–2024 period, Indonesian telecommunications companies are in a dynamic situation. Following the COVID-19 pandemic, there was an increase in data demand, digitalization acceleration, and the growth of internet-based services, forcing companies to significantly increase network investment. At the same time, the revenue of telecommunications companies tends to stagnate and not grow as fast as the investment needs, causing many issuers to face pressure on profitability despite increasing DER and DAR.

Furthermore, intense market competition and the technological shift towards 5G increasingly raise the risk of low returns from long-term investments, making the effect of leverage on profitability more complex and not always linear. Some research also suggests that the effect of DER and DAR on profitability is influenced by other variables such as company size (asset magnitude), operational efficiency, cost structure, and revenue growth. In telecommunications companies, economies of scale play a crucial role; large companies like Telkom have a better ability to absorb capital costs and multiply revenue from the same infrastructure, meaning the effect of DER/DAR on ROA/ROE may differ compared to small and medium-sized companies (Anatia Agusti dkk. 2023; Hidayah dan Faisal 2025). Thus, the literature indicates that the relationship between capital structure (DER and DAR) and profitability in the telecommunications industry is dynamic, contextual, and influenced by specific industry characteristics. This reinforces the argument that research on the effect of DER and DAR on profitability in telecommunications companies listed on the IDX during the 2021–2024 period is important to conduct, particularly to capture the post-pandemic phenomenon, capital structure tension, and the effectiveness of leverage in financing network investments (Hidayah dan Faisal 2025).

In the context of capital structure analysis, Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) are two widely used leverage indicators that reflect a company's financial policy and risk exposure. DER indicates the proportion of funding sourced from debt relative to shareholders' equity. A higher DER implies a greater reliance on external financing, which may

increase financial risk but also has the potential to enhance profitability through the leverage effect if the debt is used efficiently. DER is calculated as:

$$DER = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Meanwhile, DAR measures the extent to which a company's total assets are financed by debt. This ratio illustrates the company's long-term financial stability and solvency capacity. A high DAR indicates a greater dependency on debt to finance its assets, which may increase financial distress if the debt-financed assets do not generate sufficient returns. DAR is calculated as:

$$DAR = \frac{\text{Total Debt}}{\text{Total Assets}}$$

Profitability in this study is measured using Return on Assets (ROA) and Return on Equity (ROE), which serve as key indicators of financial performance. ROA assesses the company's ability to generate net income from its total assets, reflecting the efficiency of asset utilization in generating profits. The formula for ROA is:

$$ROA = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\%$$

On the other hand, ROE measures the company's ability to generate profit from shareholders' invested capital. It is a crucial indicator for investors because it shows the level of return generated from equity financing. ROE is calculated as:

$$ROE = \frac{\text{Net Income}}{\text{Total Equity}} \times 100\%$$

The relationship between DER, DAR, ROA, and ROE is rooted in how debt utilization affects a company's operational efficiency and profitability. When managed effectively, debt financing can support strategic investments such as network expansion, technological upgrades, and digital infrastructure development—particularly relevant in the telecommunications industry. However, excessive reliance on debt may lead to a decline in profitability due to higher interest expenses and financial risk. Therefore, the impact of leverage on profitability is contingent upon how debt is managed and how effectively it contributes to value creation for the company (Ali dan Agustin 2015).

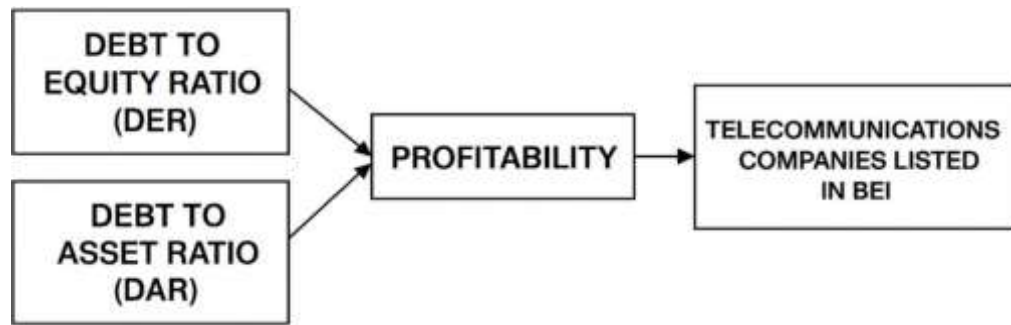


Figure 1. Conceptual Framework of DER, DAR and Profitability

The conceptual framework of this study is built on the premise that capital structure is the main element influencing a company's profitability. In this framework, DER and DAR are positioned as independent variables that affect profitability, measured by the indicators Return on Assets (ROA) and Return on Equity (ROE) (Wiyasa dan Basyith 2020). In the telecommunications industry, capital structure not only reflects funding policy but also growth strategy, network expansion, cost of capital efficiency, and the company's ability to generate added value from their information technology assets and telecommunication networks. The conceptual model states that the greater the proportion of debt (high DER or DAR), the greater the financial pressure in the form of interest expense that the company must bear. However, if that debt is used to finance productive investments such as increasing network capacity or 5G technology, then profitability can increase as long as the return from that investment exceeds the cost of capital (Rahmawati dan Putri 2025). This framework also considers that the effect of DER and DAR is not uniform across all telecommunications companies, as it depends on the scale of operations, asset utilization efficiency, level of competition, and corporate strategy. This model also assumes that the relationship between leverage and profitability is direct (direct effect), where DER and DAR impact changes in ROA/ROE without an intervening (mediating) variable. The conceptual framework of this study serves as an empirical basis to test whether leverage truly has a significant effect on the profitability of Indonesian telecommunications companies during 2021–2024 (Jurnal Ekonomi, Manajemen, Bisnis, dan Sosial (EMBISS) Volume 2, Nomor 3, Mei 2022 2022; Setiawan dan Febriana 2025).

Based on capital structure theory and previous empirical findings, this study formulates the hypothesis that the capital structure, represented by DER and DAR, has a significant effect on the profitability of telecommunications companies in Indonesia (Amalia, Rosianie, dan Herosuma 2025). An increase in DER can enhance profitability if the company can optimize the use of debt to finance productive assets, but it can lower profitability if the interest burden is greater than the investment benefit. Similarly, an increase in DAR can improve asset performance if the proportion of debt-financed assets generates adequate cash flow; however, in many cases in the telecommunications industry, high DAR is often associated with a decrease in profit margin due to high financial costs and low utilization of newly built network infrastructure.

Considering the dynamics of the telecommunications industry in the 2021–2024 period, the hypotheses are formulated as follows:

H1: The Debt to Equity Ratio (DER) has a significant effect on the profitability of telecommunications companies listed on the IDX during the 2021–2024 period.

H2: The Debt to Asset Ratio (DAR) has a significant effect on the profitability of telecommunications companies listed on the IDX during the 2021–2024 period.

Neither hypothesis establishes the direction of the effect a priori because both theory and previous empirical evidence show mixed results. Therefore, the direction of the relationship (positive or negative) will be determined by the empirical estimation results through the panel data regression method.

METHODOLOGY

This study employs a quantitative research approach with an explanatory design, grounded in positivist philosophy (Arbale dan Mutisya 2024) and utilizing a deductive approach (Bell, Harley, dan Bryman 2022) to test hypotheses derived from capital structure theories. The research incorporates a longitudinal time horizon spanning from 2021 to 2024, capturing the post-pandemic recovery period and accelerated digital transformation in Indonesia's telecommunications sector. The population comprises all telecommunications companies listed on the Indonesia Stock Exchange during this period, with a purposive sampling technique applied (Etikan, Musa, dan Alkassim 2016) based on specific inclusion criteria including continuous listing status, availability of audited financial statements, and complete data requirements. The final sample consists of four major telecommunications providers - PT Telkom Indonesia Tbk (TLKM), PT Indosat Ooredoo Hutchison Tbk (ISAT), PT XL Axiata Tbk (EXCL), and PT Smartfren Telecom Tbk (FREN) - representing approximately 80% of the sector's market capitalization (Rahmawati dan Putri 2025; Roni dan Dewi 2015; Setiawan dan Febriana 2025; Sowandi dan Pujiarti 2018).

Data collection follows rigorous documentary analysis procedures using secondary data from multiple reliable sources including official audited financial statements from Indonesia Stock Exchange publications, annual reports from company websites, regulatory filings from the Financial Services Authority (OJK), and industry reports from Indonesia Capital Market Directory. All financial data are standardized to Indonesian Rupiah (IDR) using year-end exchange rates and adjusted for inflation using the Consumer Price Index to maintain real value comparability. The study examines two independent variables - Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) - along with dependent variables measuring profitability through Return on Assets (ROA) and Return on Equity (ROE) (Jurnal Ekonomi, Manajemen, Bisnis, dan Sosial (EMBISS) Volume 2, Nomor 3, Mei 2022 2022; Pratama, Purbawati, dan Waloejo 2022; Setiawan dan Febriana 2025).

The analytical framework employs static panel data regression models (Wooldridge 2016) with comprehensive diagnostic testing procedures. The methodology incorporates descriptive analysis to understand variable

characteristics, correlation analysis to examine relationships between variables, and panel unit root tests (Levin, Lin, dan Chu 2002) to verify data stationarity. Model selection involves Chow Test, Hausman Test (Hausman, 1978), and Breusch-Pagan Lagrange Multiplier Test (Breusch dan Pagan 1980) to determine the most appropriate estimation technique between Pooled OLS, Fixed Effects, and Random Effects models. Robustness checks include alternative variable measurements, sub-sample analysis by company size, year-by-year cross-sectional regression, instrumental variable approach to address endogeneity concerns, and dynamic panel data estimation using System GMM (Roodman 2009). All statistical analyses are performed using Stata 17.0 and EViews 12, with strict adherence to academic ethics (Resnik, Elliott, dan Miller 2015) ensuring complete transparency in data sources and methodology, proper citation practices, objective data analysis without selective reporting, and thorough sensitivity analysis to validate findings.

RESEARCH RESULTS

The descriptive statistical analysis indicates that during the 2021–2024 period, the telecommunications companies examined recorded an average Debt to Equity Ratio (DER) of 1.25 and an average Debt to Asset Ratio (DAR) of 0.55. This suggests that the telecommunications sector exhibits a high dependence on debt financing, where, on average, debt exceeds equity and more than half of the companies' assets are financed by debt. Meanwhile, profitability measured by Return on Assets (ROA) and Return on Equity (ROE) shows average values of 8 percent and 12 percent, respectively. The relatively high variation across firms and years reflects uneven performance dynamics within the industry.

The initial correlation analysis reveals a significant negative relationship between both leverage variables (DER and DAR) and the two profitability indicators (ROA and ROE). This provides an early indication that an increase in leverage ratios tends to be accompanied by a decline in profitability within the observed sample.

Based on model selection tests (Chow, Hausman, and Breusch-Pagan), the Fixed Effects model was identified as the most appropriate. The panel data regression results confirm that both DER and DAR exert a negative and statistically significant effect on ROA. A one-unit increase in DER reduces ROA by 3.2 percent, while a one-unit increase in DAR decreases ROA by 4.5 percent. When profitability is measured using ROE, the results reveal a slightly different pattern: DAR remains negative and statistically significant, whereas the effect of DER on ROE is not significant at the 95 percent confidence level. These findings indicate that the proportion of debt to total assets (DAR) exerts a more consistent and substantial impact on profitability – both in terms of asset efficiency (ROA) and shareholder returns (ROE) – compared with the proportion of debt to equity (DER).

Robustness checks conducted through sub-sample analysis, the System GMM approach, and alternative profitability measures yield consistent results, strengthening the validity of the main findings. Based on the regression results, both research hypotheses can be accepted. H1, which states that DER

significantly affects profitability, is accepted particularly when profitability is measured by ROA. H2, which states that DAR significantly affects profitability, is fully accepted for both ROA and ROE. The confirmed negative direction of influence for both variables demonstrates that, in the context of Indonesian telecommunications companies during 2021–2024, an increase in leverage is associated with a decline in profitability.

DISCUSSION

The findings of this study reveal that increases in both the Debt to Equity Ratio (DER) and Debt to Asset Ratio (DAR) have a significant negative impact on the profitability of telecommunications companies listed on the Indonesia Stock Exchange during the 2021–2024 period. This finding provides empirical confirmation of concerns that the high capital intensity and debt financing in this industry—particularly to fund 5G and digital infrastructure expansion in the post-pandemic period—have not automatically translated into improved profitability in the short term. The consistently negative relationship between leverage and profitability aligns more closely with the predictions of Pecking Order Theory, which posits that firms with strong profitability tend to avoid debt, and reflects a situation where high interest expenses and financial pressure from elevated debt levels ultimately burden net income.

However, this finding appears to contradict the expectations of Trade-Off Theory, which emphasizes the tax shield benefits of debt. This theoretical conflict can be explained by the specific context of the Indonesian telecommunications industry during the study period. Large-scale infrastructure investments, such as 5G networks and data centers, have long gestation periods before generating optimal cash flows. Meanwhile, intense competition and tariff regulations limit companies' ability to rapidly increase revenue. Consequently, although debt has risen to finance future investments, the returns have not yet been able to offset the cost of debt during the observation period, resulting in a negative relationship between leverage and profitability. This phenomenon is clearly observed in companies such as XL Axiata and Smartfren, which experienced declining ROA despite revenue growth.

The results also reveal an interesting nuance: DAR exhibits a stronger and more consistent negative effect on both ROA and ROE compared to DER. This indicates that the proportion of debt to total assets—which reflects solvency risk and long-term financial dependence—is a more reliable predictor of profitability pressure than the proportion of debt to equity. In an asset-intensive industry such as telecommunications, assets financed largely by debt (high DAR) can become a burden if their utilization is not yet optimal or if such investments do not generate sufficient revenue, ultimately compressing profit margins.

This study's findings are consistent with several previous studies in Indonesia that reported a negative relationship between leverage and profitability in the telecommunications sector (e.g., Ali & Agustin, 2015; Wiyasa & Basyith, 2020). However, this research enriches the literature by demonstrating that this negative relationship persists even during the post-pandemic economic recovery and digital acceleration period (2021–2024), when investment needs

were exceptionally high. This reinforces that the dynamics between capital structure and profitability are highly contextual and depend on the industry's phase, operational efficiency, and management's ability to manage debt burdens.

The practical implications of this study are significant for corporate managers. Capital structure decisions should not be viewed merely as funding necessities but must be integrated with operational strategy and cash flow projections. Aggressive debt policies must be balanced with confidence in efficient asset utilization and adequate revenue growth to cover financial costs. For investors and analysts, these findings serve as a caution not to be swayed solely by the scale of expansion and asset growth, but to critically analyze asset productivity and cost structures, including interest expenses, before assessing long-term profitability and investment attractiveness.

This study has several limitations, including a sample limited to four major companies and a relatively short time frame (four years). Nevertheless, these companies represent the majority of the telecommunications sector's market capitalization in Indonesia. These limitations open opportunities for further research with longer observation periods, inclusion of additional control variables (such as growth, firm size, or competitive intensity), or qualitative approaches to delve deeper into the financial and operational management strategies behind the financial ratio figures.

CONCLUSION AND RECOMMENDATION

Based on the discussion above, it can be concluded that capital structure, as measured by DER and DAR, has a significant impact on the profitability of telecommunications companies in Indonesia. This study's findings confirm that the relationship between leverage and profitability is complex and contextual, influenced by company-specific characteristics and industry conditions. The 2021-2024 period, marked by accelerated digital transformation and 5G infrastructure investment, creates unique dynamics in the relationship between capital structure and financial performance. The 2021-2024 period, characterized by digital transformation acceleration and 5G infrastructure investments, created unique dynamics in the relationship between capital structure and financial performance.

This research provides theoretical contributions by reconciling inconsistent findings in previous literature, while affirming the importance of contingency approaches in capital structure analysis. From a practical perspective, the research findings emphasize the need for telecommunications company management to implement optimal capital structure policies by considering asset utilization efficiency, cash flow generation capability, and competitive market conditions.

For investors and regulators, this research provides valuable insights into the factors that influence leverage effectiveness in creating company value. The research limitations focusing on a specific period and limited companies open opportunities for further research with broader coverage and more diverse methodological approaches.

ADVANCED RESEARCH

Building upon the findings and identified limitations of this study, several trajectories for future scholarly inquiry can be formulated to expand and deepen the theoretical and empirical understanding of capital structure dynamics and financial performance, both within the telecommunications sector and across capital-intensive industries more broadly. First, from a methodological and scope perspective, subsequent research could be designed employing a longitudinal approach spanning a more extensive timeframe for instance, a decade or more to comprehensively capture complete business and investment cycles, including the mature phase of current advanced technological investments such as 5G and fibre-optic networks. Furthermore, expanding the geographical scope of the sample by incorporating telecommunications firms across different jurisdictions, particularly within ASEAN or other emerging economies, would enable robust cross-country comparative analysis. This would allow for testing the moderating role of contextual variables such as regulatory frameworks, market structures, and macroeconomic conditions on the leverage-profitability relationship. The integration of mixed-methods approaches combining quantitative panel data analysis with in-depth qualitative exploration through interviews with corporate financial decision-makers could also yield richer analytical insights into the strategic logics underpinning capital structure choices.

Second, concerning model specification and theoretical enrichment, future studies could develop more complex frameworks by incorporating relevant mediating and moderating variables. Factors such as operational efficiency (asset turnover, operating expense ratio), corporate governance mechanisms (board independence, ownership concentration), and external elements like interest rate volatility and market concentration levels could be tested as moderators of the relationship between leverage and financial performance. Further exploration into the potential existence of non-linear relationships between DER/DAR and profitability for example, through the application of threshold regression models or quadratic specifications—could aid in identifying industry-specific optimal leverage points. Third, from a thematic and contextual standpoint, significant opportunities exist to investigate contemporary issues such as the role of digital transformation as a mediating mechanism capable of converting debt burdens into enhanced profitability through the creation of innovative revenue streams. The theme of sustainable finance is also highly pertinent for deeper examination, for instance, by analysing the impact of green financial instruments (green bonds) or sustainability-linked loans on the cost of capital and firm performance. Additionally, future research could integrate risk analysis by examining the interaction between financial risk arising from leverage and operational risks such as technological disruption or cybersecurity threats, and their consequent implications for a firm's overall risk profile and valuation.

In conclusion, while this study provides a significant empirical contribution by documenting a negative relationship between leverage and profitability in the post-pandemic Indonesian context, its findings simultaneously unveil a broader intellectual landscape for subsequent research.

The future research directions outlined above hold the potential not only to enrich academic discourse in the fields of corporate finance and industrial strategy but also to yield more nuanced, contextual, and actionable policy and managerial implications, particularly for stakeholders operating within highly dynamic industrial environments.

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