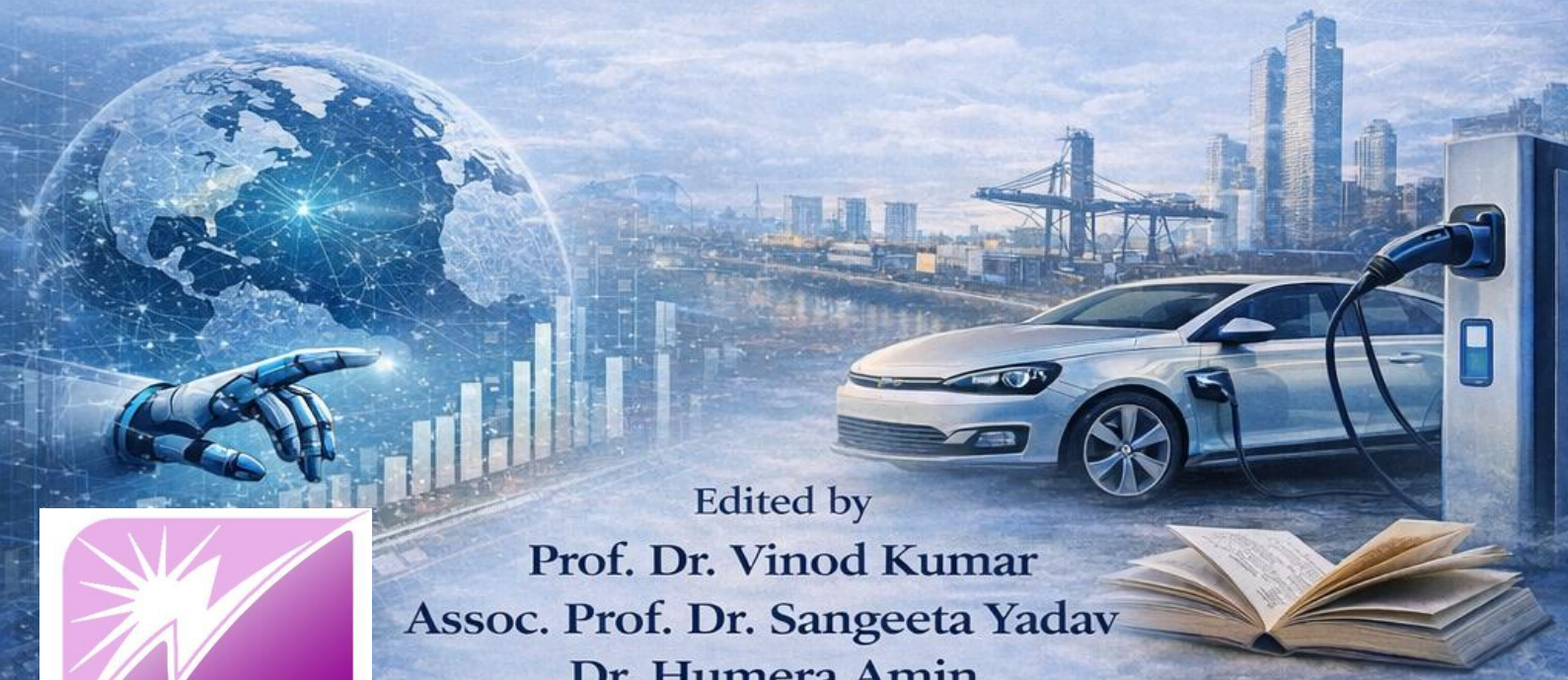
NCM
PUBLISHING HOUSE

Corporate Financial Performance, Distress, and Resilience in Emerging Economies

Firm–Level Evidence in Times of Crisis and Transformation (2020–2025)



Edited by
Prof. Dr. Vinod Kumar
Assoc. Prof. Dr. Sangeeta Yadav
Dr. Humera Amin

www.ceocongress.org

NCM Publishing

Corporate Financial Performance, Distress, and Resilience in Emerging Economies: Firm-Level Evidence in Times of Crisis and Transformation (2020–2025)

Editors

Prof. Dr. Vinod KUMAR

Assoc. Prof. Dr. Sangeeta YADAV

Dr. Humera Amin

Published by: NCM Publishing House

Publishing Date: 27.12.2025

ISBN: 978-625-96723-4-2

Corporate Financial Performance, Distress, and Resilience in Emerging Economies: Firm-Level Evidence in Times of Crisis and Transformation (2020–2025)

Publication No: **35**

Editors	***Prof. Dr. Vinod KUMAR*** ***Assoc. Prof. Dr. Sangeeta YADAV*** ***Dr. Humera Amin***
Cover Designer	***Kerim Karadal***
ISBN	**978-625-96723-4-2**
Publisher Certificate No	**51898**
Publisher Type	International Publishing House
Release Year	2025

NCM Publishing

CONTACT

Phone: +90 505 965 4613
e-mail: ceocongress.info@gmail.com
www.ceocongress.org

LIBRARY INFORMATION CARD

KUMAR, Vinod; YADAV, Sangeeta; Amin, Humera; Editor, 12, 2025. NCM Publishing House, Bursa.
Language: English, Editors: Prof. Dr. Vinod KUMAR, Assoc. Prof. Dr. Sangeeta YADAV, Dr. Humera Amin
ISBN: **978-625-96723-4-2**

PREFACE

The period between 2020 and 2025 has been characterized by overlapping crises and structural transformations that have significantly reshaped corporate financial performance in emerging economies. The COVID-19 pandemic, global supply chain disruptions, energy market transitions, rapid digitalization, and increasing environmental pressures have jointly intensified financial risks while simultaneously creating new strategic challenges for firms. In such a volatile environment, analyzing corporate performance requires an integrated focus on financial outcomes, distress dynamics, and resilience-building strategies.

The edited volume Corporate Financial Performance, Distress, and Resilience in Emerging Economies: Firm-Level Evidence in Times of Crisis and Transformation (2020–2025) brings together empirical, firm-level studies that examine how corporations operating in emerging market contexts respond to periods of crisis and transformation. With a particular emphasis on Indonesia, the book provides sectorally diverse evidence from strategically important industries, including aviation, construction, energy, telecommunications, logistics, mining, and digital technology. These sectors represent the backbone of emerging economies and are especially vulnerable to systemic shocks and policy-driven change.

The chapters employ widely used financial analysis tools—such as financial ratio analysis, Altman Z-Score models, and restructuring assessments—to evaluate corporate financial health, distress signals, and recovery efforts. Several contributions focus on firms facing declining demand, high leverage, or structural inefficiencies, offering insights into the mechanisms through which financial distress emerges and how it can be mitigated through capital injections, deleveraging strategies, mergers, and strategic realignment. These analyses highlight the practical relevance of financial diagnostics for both managers and policymakers.

Beyond financial distress, the volume emphasizes corporate resilience in times of uncertainty. A number of chapters explore how firms adapt to changing technological and market conditions, particularly in the context of digital transformation, energy transition, and infrastructure expansion. The book also extends the analysis to broader transformation processes by addressing green innovation and environmental trade-offs, illustrating how corporate financial performance is increasingly shaped by sustainability-related considerations.

This book is intended for scholars and graduate students in finance, economics, and management, as well as practitioners and policymakers interested in corporate resilience and financial stability in emerging economies. By offering firm-level evidence from a critical period of global disruption, the volume contributes to a deeper understanding of how corporations in emerging markets confront financial challenges and navigate transformation.

Prof. Dr. Vinod KUMAR
Assoc. Prof. Dr. Sangeeta YADAV
Dr. Humera AMIN
Bursa
December 2025

CONTENTS

CHAPTER 1
Ratio Repair at a Flag Carrier: Financial Ratio Dynamics of Garuda Indonesia (2020–2025) and the Pro Forma Effect of Danantara's November 12, 2025 Capital Injection

Ihsan Fauzi RAHMAN
IPMI Institute, Indonesia
Ihsan.rahman@ipmi.ac.id
ORCID: 0009-0002-6610-151X

Melani Halena TAMONOB
IPMI Institute, Indonesia
Melani.tamonob@ipmi.ac.id
ORCID : 0009-0001-8748-7784

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
ORCID: 0000-0003-3582-5857

ABSTRACT

This paper examines the evolution of Garuda Indonesia's financial ratios between 2020 and 2025 and estimates how a state backed recapitalization by Danantara Indonesia (BPI Danantara), approved by shareholders on 12 November 2025, changes those ratios on a pro forma basis. The analysis draws on audited annual reports (2020–2024), interim 1H 2025 financial statements, and official disclosures on the private placement. It covers profitability (net profit margin, return on assets, return on equity), liquidity (current and cash ratios), activity (total asset turnover), and solvency (debt to equity and liabilities to assets).

The COVID 19 shock produced deeply negative margins and equity in 2020–2021. After a court sanctioned restructuring, Garuda reported a profit in FY 2023, but this was driven largely by non operating items such as impairment reversals and bond buybacks. Losses returned in 1H 2025 and equity remained negative, reflecting high leverage and heavy maintenance costs.

On a pro forma basis, the November 12 recapitalization—US$1.44 billion of new equity plus conversion of a US$405 million shareholder loan—materially repairs the balance sheet. The current ratio rises from 0.44× (June 2025) to around 1.5×, negative equity turns positive, and leverage and interest coverage ratios move closer to typical industry ranges. Without the transaction, liquidity and solvency constraints would persist; with it, Garuda's financial position shifts from distress to a watch/adequate posture, assuming disciplined execution. The case shows how capital structure adjustments can support post pandemic airline turnarounds in emerging markets and provides timely context around the shareholder decision.

Keywords: Financial Ratio Analysis; Garuda Indonesia; Sovereign Wealth Fund; Private Placement; Capital Structure.

1. INTRODUCTION

The COVID-19 pandemic radically disrupted the airline industry. Passenger demand collapsed almost overnight, fleets were grounded for long periods, and fixed costs kept running even when aircraft barely flew. Many carriers had to renegotiate debt, seek government support, or enter formal restructuring processes. Garuda Indonesia (GIAA) is one of the clearest examples of how deep and long-lasting those financial pressures can be.

In 2022, Garuda underwent a court-sanctioned homologation process. Legally, this gave the company room to breathe and reorganize its obligations; commercially, however, the balance sheet was left in a fragile state. The airline exited the process with high leverage and negative equity. Even when revenues started to recover, the FY-2024 consolidated financial statements still showed total liabilities exceeding total assets, signalling that solvency remained a central concern rather than a mere technicality in the notes.

The turning point in the narrative came in 2025, when Indonesia's sovereign investment platform, Danantara (Badan Pengelola Investasi / Danantara Asset Management), stepped in as a strategic financial sponsor. In June 2025, Danantara provided a shareholder loan of around US$405 million to fund maintenance and the reactivation of grounded aircraft. Later in the year, on 12 November 2025, an Extraordinary General Meeting (EGM) approved a private placement of approximately Rp23.67 trillion (about US$1.4 billion) into Garuda and its low-cost subsidiary, Citilink.

This study looks at Garuda's situation through the lens of financial ratios. It follows how key indicators of liquidity, solvency, profitability, and activity behave between 2020 and 2025 and then overlays the November 12 recapitalization to see how those ratios would change on a pro forma basis. In simple terms, the paper asks two questions: (1) what do the ratios tell us about Garuda's financial health over the crisis and recovery period; and (2) to what extent does the Danantara transaction repair that health, at least on paper?

2. LITERATURE REVIEW

Financial-ratio analysis has long been a standard tool for interpreting corporate accounts. Ratios condense the information contained in the balance sheet and income statement into indicators that are easier to compare across time and across firms. For airlines, certain ratios tend to matter more than others: liquidity measures, because cash and short-term obligations are critical in a high fixed-cost business, and leverage measures, because aircraft financing and leasing structures can quickly amplify shocks (Brealey, Myers, Allen, & Edmans, 2025; Ross, Westerfield, Jaffe, Jordan, & Shue, 2025).

Capital-structure theory—in particular, the trade-off between the tax benefits of debt and the costs of financial distress—provides a useful frame for thinking about recapitalizations. When a company's equity base has been eroded, new equity and debt reduction can lower the probability of distress and improve the firm's ability to absorb volatility (Brigham & Ehrhardt, 2023; Zutter & Smart, 2024). In practice, the "right" level of leverage also depends on the stability of cash flows, access to capital markets, and the nature of the firm's assets. Airlines typically sit at the risky end of this spectrum.

A second strand of the literature comes from managerial and cost accounting. Here the focus shifts from the structure of the balance sheet to the cost of keeping aircraft safe and available. Maintenance, repair and overhaul (MRO), heavy checks, and reactivation of grounded aircraft create lumpy cash needs and affect how quickly a carrier can convert an improved demand environment into revenue and margin. The way these activities are scheduled and either capitalized or expensed shapes both short-term profit and long-term asset performance (Datar & Rajan, 2025; Garrison, Noreen, & Brewer, 2025).

Pulling these strands together, the Garuda–Danantara case can be seen as a combination of balance-sheet repair—very much in the spirit of capital-structure textbooks—and operational recovery, where managerial

accounting and MRO planning determine whether the new capital translates into sustainable improvements in performance.

3. RESEARCH METHODS

3.1 Design and scope

The research adopts a descriptive case-study approach. Rather than building a formal econometric model, it tracks a set of core financial ratios over time and interprets their movements in light of key events, especially the 2022 restructuring and the 2025 recapitalization. The period of interest runs from FY-2020, when the pandemic shock fully hit Garuda's operations, through to mid-2025, just before the November EGM.

3.2 Data

The analysis relies on publicly available financial disclosures. These include Garuda's audited annual reports for 2020–2024 and the interim consolidated financial statements for the first half of 2025. To understand management's intent and the structure of the recapitalization, the study also uses investor-relations presentations and the official EGM materials. News reports and exchange disclosures from November 2025 help cross-check the size of the planned private placement and the planned allocation of funds.

3.3 Measures

The ratio set is organized into four groups:

- **Profitability:** net profit margin, return on assets (ROA), return on equity (ROE)
- **Liquidity:** current ratio, cash ratio
- **Activity:** total asset turnover (TATO)
- **Solvency:** liabilities-to-assets (L/A), debt-to-equity (D/E)

The definitions follow standard finance texts (Brigham & Ehrhardt, 2023; Zutter & Smart, 2024). The exact formulas are summarized in Table 1 and then applied to Garuda's reported figures.

3.4 Pro forma scenarios

To isolate the effect of the Danantara transaction, the study treats **30 June 2025** as the starting point. From that base, two pro forma scenarios are constructed:

- **Scenario A** reflects an initial framing of roughly **US$1.85 billion** in support (US$1.44 billion of fresh equity plus a US$405 million loan conversion).
- **Scenario B** reflects the smaller, **EGM-approved package** of about **US$1.4 billion** of new equity plus the same loan conversion.

The scenarios are intentionally simple "what-if" exercises designed to show how the balance sheet and key ratios might look once the equity injection and loan conversion have been recorded.

4. RESULTS AND DISCUSSION

4.1 Baseline ratio patterns (2020–1H 2025)

Profitability. The early pandemic years, 2020 and 2021, are marked by deep losses. Passenger volumes and yields collapsed, while many fixed and semi-fixed costs could not be cut at the same pace. After the homologation process, FY-2023 shows a return to reported profit. However, a closer look reveals that much of this turnaround is driven by non-operating items—especially impairment reversals and gains on debt buybacks—rather than a broad-based recovery in operating performance. FY-2024 moves back into modest net loss territory, underlining that the underlying business remains under strain.

Liquidity. By 30 June 2025, the current ratio sits at around **0.44×**. In practical terms, this means that for every dollar of current liabilities, Garuda has only forty-four cents of current assets. Such a position leaves

little room to absorb shocks or delays in cash inflows and typically forces management into very tight cash-management and payment-negotiation practices.

Solvency. On the solvency side, the picture is even starker. Mid-2025 equity is still negative, roughly **−US$1.5 billion**, so standard leverage measures like D/E are not informative. The liabilities-to-assets ratio is greater than one, which simply reflects that creditors' claims exceed the recorded value of the asset base. In that sense, the 2022 restructuring has bought time and reorganized claims, but it has not yet rebuilt net worth.

4.2 Transaction mechanics

The recapitalization approved on 12 November 2025 consists of two tightly linked elements. First, Danantara injects new equity via a private placement. Second, a previously extended shareholder loan is converted into equity. Legal details—such as the use of a capital increase without pre-emptive rights (PMTHMETD)—matter for existing shareholders, but the economic substance is straightforward: more equity and less debt.

The total value of the package is about **Rp23.67 trillion (~US$1.4 billion)**. Importantly, management communication emphasizes that the bulk of the funds will go to maintenance and fleet readiness, and to strengthening Citilink, rather than to rapid expansion. That choice already hints at the intended link between balance-sheet repair and operational reliability.

4.3 Pro forma impact on ratios

In **Scenario A**, using the larger initial framing of the deal, management indicated that the **current ratio** could improve from roughly 0.44× to about **1.53×**, and that the **equity account** would finally turn positive once the shareholder loan had been converted.

In **Scenario B**, based on the smaller package that was actually approved, the uplift is more modest. Even under this configuration, however, the company is projected to move to a current ratio **above 1.0×** and to equity that is close to break-even. The precise outcomes would depend on factors such as the exact timing of cash inflows and how quickly the funds are drawn down for maintenance and other uses.

4.4 Interpretation

Looking at these changes through a **liquidity** lens, the move from a current ratio of 0.44× to a level above 1× is significant. It does not guarantee comfort—many analysts would prefer to see something closer to 1.5× or higher for a volatile industry—but it does shift the company out of the most acute short-term danger zone. The improvement is driven primarily by the equity cash inflow and by the reduction of certain liabilities, not by a sudden surge in operating earnings (Brigham & Ehrhardt, 2023).

From a **solvency** perspective, shifting from negative to positive equity is psychologically and practically important. It changes how creditors, lessors, and even employees may perceive the company's long-term viability. That said, the pro forma D/E ratio remains high, and further deleveraging or retained earnings would be needed before Garuda could be described as comfortably capitalized.

Finally, when thinking about **earnings quality**, the contrast between FY-2023 and subsequent periods is instructive. A spike in profit driven by accounting adjustments is very different from a sustained improvement driven by higher load factors, better yields, and more efficient use of the fleet. For the recapitalization to be judged a success, the new capital must eventually translate into such operational improvements, not just a cleaner balance sheet (Datar & Rajan, 2025; Garrison et al., 2025).

4.5 Illustrative ratio calculations before and after the Danantara transaction

Because the ratios can sometimes feel abstract, this section walks through a simplified numerical example that mirrors the patterns observed in Garuda's disclosures. All figures are in US$ million and are meant for illustration; the logic, however, can be applied directly to the actual financial statements.

4.5.1 Baseline as of 30 June 2025

Management guidance suggests that, at 30 June 2025, the current ratio was roughly:

$\text{Current Ratio}_0 = \text{Current Assets}_0 / \text{Current Liabilities}_0 \approx 0.44$

Suppose, for illustration, that:

- Current liabilities (CL_0) = 1,320
- Current assets (CA_0) = 0.44 × 1,320 ≈ 581
- Non-current liabilities (NCL_0) = 3,900
- Equity (EQ_0) = −1,500

Then:

- $\text{Total liabilities}_0 = CL_0 + NCL_0 = 1{,}320 + 3{,}900 = 5{,}220$
- $\text{Total assets}_0 = \text{Total liabilities}_0 + EQ_0 = 5{,}220 - 1{,}500 = 3{,}720$
- Non-current assets (NCA_0) = $\text{Total assets}_0 - CA_0 = 3{,}720 - 581 = 3{,}139$

Baseline ratios:

- $\text{Current ratio}_0 = 581 \div 1{,}320 \approx 0.44\times$
- $\text{Liabilities-to-assets}_0 = 5{,}220 \div 3{,}720 \approx 1.40$ (140%)

Because equity is negative, a conventional D/E ratio is not very informative and is usually described as “not meaningful”.

4.5.2 Pro forma position after the Danantara transaction (Scenario A)

In the initial framing (Scenario A), Danantara is expected to provide:

- Fresh equity of **US$1,440 million** (received in cash)
- Loan conversion of **US$405 million** (shareholder debt turned into equity)

The fresh equity boosts current assets:

- $CA_1 = CA_0 + 1{,}440 = 581 + 1{,}440 = 2{,}021$

Assuming current liabilities are unchanged:

- $CL_1 = CL_0 = 1{,}320$

The new current ratio is:

- $\text{Current ratio}_1 = 2{,}021 \div 1{,}320 \approx \mathbf{1.53}\times$

The loan conversion reduces non-current liabilities:

- $NCL_1 = NCL_0 - 405 = 3{,}900 - 405 = 3{,}495$

Total assets after the injection:

- $\text{Total assets}_1 = CA_1 + NCA_0 = 2{,}021 + 3{,}139 = 5{,}160$

Total liabilities:

- $\text{Total liabilities}_1 = CL_1 + NCL_1 = 1{,}320 + 3{,}495 = 4{,}815$

Equity:

- $EQ_1 = \text{Total assets}_1 - \text{Total liabilities}_1 = 5{,}160 - 4{,}815 = 345$

Updated ratios:

- $L/A_1 = 4{,}815 \div 5{,}160 \approx 0.93$ (93%)
- $D/E_1 = 4{,}815 \div 345 \approx 13.96\times$

The numerical example illustrates what the narrative suggests: the Danantara transaction transforms Garuda from a company with negative equity and very weak liquidity into one that, while still highly leveraged, has positive net worth and a more defensible liquidity buffer.

Table 1. Data sources and periods

Source	Period / Notes
Audited annual reports	2020–2024
Interim consolidated financial statements	1H-2025 (as of 30 June 2025)
Corporate presentations / EGM materials	2023–2025 (including 12 Nov 2025 EGM)
Market and press disclosures	Nov 2025, for proceeds size and allocation corroboration

Table 2. Pro forma impact synopsis (30-Jun-2025 baseline)

Indicator	Baseline (30-Jun-2025)	Scenario A (initial)	Scenario B (approved)
Current Ratio	≈ 0.44×	≈ 1.53×	> 1.0× (~1.2× range)
Equity	Negative (~US$−1.5bn)	Turns positive	Near break-even
Leverage (L/A, D/E)	Elevated; D/E not meaningful	Normalizes toward industry	Improves; L/A near parity

5. CONCLUSIONS

Viewed over the full 2020–2025 period, Garuda's financial ratios trace a path from crisis to partial repair. The early pandemic years brought heavy losses and a collapse in equity. The 2022 homologation process restructured claims but did not rebuild net worth. FY-2023 delivered a one-off profit heavily influenced by accounting gains; FY-2024 and 1H-2025 showed that underlying pressures—especially maintenance and leverage—remained.

The Danantara recapitalization changes this trajectory. In the larger, initial framing, the current ratio climbs from 0.44× to about 1.53× and equity turns clearly positive. In the smaller, approved package, the improvement is less dramatic but still important: the current ratio moves above 1× and equity approaches break-even. In both cases, the company shifts from a position of acute financial stress to one in which recovery is at least feasible, provided that the new capital is managed carefully.

References

Berk, J., & DeMarzo, P. (2023). ***Corporate Finance*** (6th ed.). Pearson.
Brigham, E. F., & Ehrhardt, M. C. (2023). ***Financial Management: Theory & Practice*** (17th ed.). Cengage Learning.
Brealey, R. A., Myers, S. C., Allen, F., & Edmans, A. (2025). ***Principles of Corporate Finance*** (15th ed.). McGraw-Hill.
Datar, S. M., & Rajan, M. V. (2025). ***Horngren's Cost Accounting: A Managerial Emphasis*** (18th ed.). Pearson.
Garrison, R. H., Noreen, E. W., & Brewer, P. C. (2025). ***Managerial Accounting (2025 Release)***. McGraw-Hill.
Ross, S. A., Westerfield, R. W., Jaffe, J., Jordan, B. D., & Shue, K. (2025). ***Corporate Finance (2025 Release)***. McGraw-Hill.
Zutter, C. J., & Smart, S. B. (2024). ***Principles of Managerial Finance*** (16th ed., Global Edition). Pearson.
Garuda Indonesia. (2025). ***Interim Consolidated Financial Statements as of June 30, 2025***. Investor Relations.
Garuda Indonesia. (2024). ***Consolidated Financial Statements (FY-2024)***. Investor Relations.
Garuda Indonesia. (2025, Nov 12). ***Extraordinary General Meeting of Shareholders – Materials***. Investor Relations.
Reuters. (2025, Nov 11). Garuda Indonesia equity injection cut by about $400 million, company says.
The Jakarta Post. (2025, Nov 10). Garuda Indonesia to raise $1.4b via private placement.
VOI. (2024, Apr 2). Bond buyback gain and impairment reversal lifted 2023 profit.
IDNFinancials. (2025, Oct 10). Management guidance: current ratio to ~1.53× under US$1.44bn cash scenario.

CHAPTER 2
Financial Performance Evaluation of PT. Charoen Pokphand (Persero) Tbk Using Financial Ratio Analysis From 2020 to 2024

Muhammad Indra CHAIDIR
IPMI Institute, Indonesia
indra.chaidir@ipmi.ac.id
Orcid: 0009-0006-1777-1532

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

Randy Alaric JUREMI
IPMI Institute, Indonesia
randy.juremi@ipmi.ac.id
Orcid: 0009-0002-7940-7462

ABSTRACT

The Indonesia's livestock industry has recorded significant growth in recent years. Based on data from the Central Statistics Agency (BPS), by 2024 there were 227 active livestock companies reporting a total revenue of IDR 3.53 trillion and a net profit of IDR 1.35 trillion. The sector remains concentrated on the island of Java, particularly in West Java, which hosts most poultry enterprises. As the industry contributes to national food security and rural economic development, assessing the financial condition of major players is essential. This study evaluates the financial performance of PT Charoen Pokphand Indonesia Tbk (CPIN) as one of the leading poultry firms and compares it with selected peers within the same sector. The analysis applies financial ratio assessment covering four dimensions: liquidity, solvency, activity, and profitability. Secondary data were obtained from audited financial statements over a defined observation period in 2021 - 2024. The results show that CPIN maintains a strong solvency position with a debt-to-equity ratio of approximately 41.27%, indicating low financial leverage in livestock industry in 2024. The liquidity ratios exhibit noticeable fluctuations throughout 2021–2024, indicating short-term cash flow management pressures particularly during 2022–2023. Nevertheless, the firm demonstrates a strong recovery trajectory, achieving a compound annual growth rate (CAGR) of 10.2% over the period. CPIN performs above average in profitability and solvency but shows moderate efficiency in asset utilization. Overall, CPIN's financial position is sound and generally superior to most competitors, though consistent liquidity management and operational efficiency remain areas for improvement.

Keywords: Financial Ratio Analysis; Liquidity Ratio; Solvency Ratio; Profitability Ratio; Financial Performance.

INTRODUCTION

In recent years, competition among industries in Indonesia has intensified, particularly in sectors related to food supply and agricultural production. The livestock and poultry industry has become one of the most dynamic components of the national food system due to rising population growth, expanding middle-class consumption, and increasing demand for affordable protein sources. According to the Indonesia Stock Exchange (IDX) throughout 2021 – 2024 and supporting statistical reports, companies operating in the poultry and feed sector recorded consistent revenue expansion throughout 2021–2024, driven by higher output in broiler production, processed poultry products, and commercial feed distribution. The industry also plays an important role in national food security, as poultry meat contributes the largest share of animal protein consumed by Indonesian households.

Within this sector, PT Charoen Pokphand Indonesia Tbk (CPIN) stands as one of the largest and most influential companies. CPIN operates an integrated agribusiness model covering animal feed production, day-old-chicks (DOC), broiler farming, and processed poultry products. Its broad distribution network, long operational history, and strong market position place CPIN at the forefront of competition with other major players in the livestock and poultry sector. As a publicly listed company on the Indonesia Stock Exchange, CPIN's financial performance receives considerable attention from investors, analysts, and policymakers, especially during 2024, according to IDN Financial, the ascent of Prabowo Subianto to the Indonesian presidency in 2024 corresponded with a 41.03% increase in CPIN's net profit. This substantial growth is widely attributed to the implementation of the President's "Free Nutritious Meals" (MBG) program, which is considered a major contributing factor to the company's improved financial performance.

Financial performance plays a vital role in determining the sustainability of a company, especially in industries with high operational costs and sensitivity to commodity price fluctuations. A company's financial condition is commonly assessed through the analysis of financial statements, which provide a structured overview of assets, liabilities, revenues, and overall profitability. Evaluating financial performance through ratio analysis enables stakeholders to judge whether the company is managing its resources efficiently, fulfilling its financial obligations, and generating sufficient returns. According to Brigham and Houston (2010), financial ratios are constructed as instruments that assist users in analyzing financial reports by utilizing the information contained in both the balance sheet and the income statement.

Financial ratio analysis can be performed by utilizing figures from the balance sheet, income statement, or a combination of both. This study employs four major categories of ratios: liquidity, solvency, activity, and profitability. Brigham and Houston (2018) explain that liquidity ratios illustrate how a company's cash and other current assets relate to its short-term liabilities. Current assets typically include cash and cash equivalents, marketable securities, accounts receivable, and inventories, whereas current liabilities consist of obligations such as accounts payable, accrued wages and taxes, and short-term notes payable—all of which mature within one year. Liquidity ratios, as described by Brigham and Houston (2018), illustrate the relationship between a firm's cash position, its broader pool of current assets, and the short-term obligations that must be met within the year. In addition, solvency ratios, according to Brigham and Houston (2009), indicate the degree to which a company depends on debt financing and help evaluate the financial pressure created by its outstanding obligations relative to its assets. Brigham and Houston (2009) further emphasize that activity ratios assess how effectively and efficiently a firm utilizes the assets under its control to support operational performance. Complementing these perspectives, Wachowicz (2009) explains that profitability ratios connect a company's earnings to its sales or invested capital, offering a key signal of overall financial performance and forming an integral part of corporate financial reporting.

The poultry and feed industry listed on IDX has demonstrated fluctuating financial outcomes in recent years due to changes in feed raw material prices, production costs, and shifts in consumer purchasing power. However, several leading companies, including CPIN, showed resilience and maintained competitive performance across the 2021–2024 period. These conditions make CPIN a relevant subject for examining how financial strategies and operational decisions affect a company's overall financial strength.

Based on this background, the present study aims to evaluate the financial performance of PT Charoen Pokphand Indonesia Tbk using financial ratio analysis during the period 2021–2024. The use of liquidity, solvency, activity, and profitability ratios is expected to provide a comprehensive assessment of CPIN's financial condition and its position within Indonesia's livestock and poultry supply industry.

LITIATURE REVIEW

1. LIVESTOCK INDUSTRY

The livestock industry has increasingly become an essential pillar of the national food system, especially in developing countries where demand for affordable protein continues to rise. In Indonesia, poultry dominates the livestock sector because chicken meat remains the most accessible source of animal protein for the majority of households. Studies from international and regional institutions note that livestock activities not only support food availability but also contribute to rural employment and economic development (FAO, 2021). Within this context, companies such as PT Charoen Pokphand Indonesia Tbk (CPIN) play a major role as they operate across multiple segments—from feed manufacturing to broiler production and processed chicken products.

2. FINANCE

Finance forms the backbone of how companies manage their economic resources and navigate business challenges. It covers decisions about how funds are acquired, allocated, and controlled to ensure that operations run effectively. Scholars highlight that financial decision-making becomes even more critical in industries facing frequent cost fluctuations, such as livestock and poultry (Brigham & Houston, 2019).

3. FINANCIAL MANAGEMENT

Financial management refers to the coordinated processes through which an organization manages its financial resources. Mehta (2018) describes it as a set of activities that include planning, budgeting, monitoring, and safeguarding funds. Whiteley (2003) emphasizes that financial management only becomes meaningful when translated into concrete actions and decision-making. Jain (2005) adds that in modern business environments, financial management offers a conceptual framework for evaluating various financial decisions and understanding their long-term impact.

Agribusiness company like CPIN, financial management is essential for ensuring that investment decisions, cost structures, and operational activities remain aligned with strategic goals. The company must coordinate finances across its feed mills, breeding farms, processing plants, and distribution-channels. Effective financial management allows CPIN to control costs, maintain liquidity, and handle fluctuations in input prices—factors that are crucial in sustaining competitiveness within the livestock industry.

4. FINANCIAL STATEMENTS

Financial statements provide a structured account of a company's financial performance and are one of the primary tools for assessing business health. Whiteley (2017) notes that periodic reporting—whether quarterly or annually—is necessary for tracking changes in revenue, expenses, and asset conditions. Gibson (2013) explains that financial statements such as balance sheets and income statements help users interpret profitability and financial stability. Murphy (2020) also highlights that

written financial disclosures serve as a formal communication medium through which companies present their operational and financial activities to stakeholders.

For CPIN, financial statements are particularly important because the company operates in a sector where production costs and market prices can shift quickly. As a listed company on the Indonesia Stock Exchange (IDX), CPIN's financial reports allow investors and analysts to review its cost structure, revenue trends, debt levels, and cash flow performance. These insights help stakeholders understand how well the company adapts to industry challenges, including changes in feed prices, disease risks in poultry farming, and shifts in consumer demand.

5. ANALYSIS OF FINANCIAL STATEMENTS

A company's periodic financial reports—quarterly and annual—are published to provide transparent evidence of operational outcomes and to show whether revenues and profits are rising or falling over time. Beyond simple disclosure, these reports must be examined systematically so stakeholders can monitor financial trends and make informed decisions. Identifying financial characteristics through statement analysis allows firms to interpret their position and propose corrective measures when necessary (Halim, 2007). In this sense, preparing financial statements is not an end in itself; proper analysis converts raw numbers into actionable insight and becomes the basis for corporate valuation and economic decision-making (Rao, 2011; Alamry, 2020).

For firms in the livestock and poultry supply chain—like PT Charoen Pokphand Indonesia Tbk (CPIN)—financial statement analysis is especially important. CPIN's integrated operations (feed mills, breeding, broiler production, processing) expose it to commodity price swings and working-capital pressures; therefore, ratio analysis helps reveal strengths and vulnerabilities in short-term liquidity, long-term financing, asset utilization, and profitability. The most widely used ratio framework is grouped into four categories: liquidity, solvency (leverage), activity (efficiency), and profitability. Below are an overview of each category and its relevance for companies such as CPIN.

1. Liquidity Ratios

Liquidity ratios assess a firm's ability to meet its short-term commitments (Webb, 2010). These metrics are vital for CPIN since poultry operations depend heavily on uninterrupted cash cycles to support feed procurement, chick production, and daily operational expenditures.

A. Current Ratio

This ratio compares current assets with current liabilities to evaluate near-term financial readiness. Agustina (2018) explains that it reflects the degree to which short-term assets can be converted into cash. For CPIN, a stable current ratio indicates the ability to maintain operational continuity amid shifts in production cycles.

B. Quick Ratio

The quick ratio provides a more conservative measure of liquidity by excluding inventories (Kaur, 2016). In CPIN's case, this is relevant because feed and live poultry inventories are sensitive to biological conditions and price fluctuations.

C. Cash Ratio

This ratio measures the extent to which cash and cash equivalents alone can cover short-term obligations (Bragg, 2007). For industries with time-sensitive production processes, such as poultry farming, maintaining adequate cash reserves helps mitigate sudden changes in raw material prices.

2. Solvency Ratios

Solvency ratios evaluate the company's long-term financial stability and capital structure. Wagner (2003) describes them as indicators of a firm's ability to meet future obligations. This assessment is particularly relevant to CPIN because the livestock industry requires substantial investment in feed mills, breeding facilities, and distribution networks.

A. Debt to Equity Ratio (DER)
   DER measures the proportion of debt relative to shareholders' equity. Endri (2019) notes that higher leverage increases financial risk. CPIN's relatively low DER reflects a conservative capital approach and supports its long-term sustainability.
B. Debt to Asset Ratio (DAR)
   DAR compares total liabilities to total assets, illustrating how much of the company's resources are financed through debt (Engle, 2010). A moderate DAR helps CPIN maintain flexibility in investment decisions within a capital-intensive sector.

3. Activity Ratios

Activity ratios analyse how effectively a company utilizes its assets to generate sales. Jain (2007) highlights that strong asset management is essential for accelerating the conversion of resources into revenue. These ratios are especially relevant for CPIN, given its extensive inventory cycles and reliance on efficient supply chain operations.

A. Total Asset Turnover
   This ratio compares net sales with total assets to evaluate overall utilization efficiency (Megginson, 2008). CPIN's large asset base—which includes breeding farms, feed operations, and processing plants—requires effective use to remain competitive.
B. Fixed Asset Turnover
   This metric assesses how efficiently fixed assets such as feed mills, poultry houses, and processing equipment generate revenue (Stickney, 2009). In the poultry industry, maximizing returns on installed capacity is critical due to high overhead costs.
C. Inventory Turnover
   Inventory turnover measures how quickly stock is sold and replaced (Nuhu, 2014). For CPIN, timely rotation of feed, raw materials, and live birds is fundamental to maintaining product quality and reducing biological risks.
D. Average Age of Receivables
   This ratio indicates how long it takes a company to convert receivables into cash (Kusuma, 2018). Efficient collection cycles benefit CPIN by supporting stable cash flow, especially when working with distributors and retailers.

4. Activity Ratios

Activity ratios analyse how effectively a company utilizes its assets to generate sales. Jain (2007) highlights that strong asset management is essential for accelerating the conversion of resources into revenue. These ratios are especially relevant for CPIN, given its extensive inventory cycles and reliance on efficient supply chain operations.

E. Total Asset Turnover
   This ratio compares net sales with total assets to evaluate overall utilization efficiency (Megginson, 2008). CPIN's large asset base—which includes breeding farms, feed operations, and processing plants—requires effective use to remain competitive.
F. Fixed Asset Turnover
   This metric assesses how efficiently fixed assets such as feed mills, poultry houses, and processing equipment generate revenue (Stickney, 2009). In the poultry industry, maximizing returns on installed capacity is critical due to high overhead costs.
G. Inventory Turnover

Inventory turnover measures how quickly stock is sold and replaced (Nuhu, 2014). For CPIN, timely rotation of feed, raw materials, and live birds is fundamental to maintaining product quality and reducing biological risks.

H. Average Age of Receivables

This ratio indicates how long it takes a company to convert receivables into cash (Kusuma, 2018). Efficient collection cycles benefit CPIN by supporting stable cash flow, especially when working with distributors and retailers.

5. Profitability Ratios

Profitability ratios assess the company's ability to generate earnings relative to its sales, assets, or equity. According to Sultan (2014), profitability influences a company's capacity to attract external financing and determines its overall financial resilience. Consistent profitability is essential for CPIN, as the livestock sector is exposed to high input costs and cyclical demand.

6. Net Profit Margin (NPM)

NPM indicates the amount of net income generated per unit of sales (Sultan, 2014). For CPIN, a healthy margin suggests effective cost control in feed production and poultry operations.

7. Return on Equity (ROE)

ROE evaluates how efficiently shareholder capital generates profits (Hargrave, 2020). A solid ROE reflects CPIN's ability to create value for investors within a competitive agribusiness landscape.

8. Return on Investment (ROI)

ROA measures the profitability of total assets (James, 2020). This ratio is particularly significant for CPIN, which manages large-scale biological and physical assets.

9. Operating Profit Margin (OPM)

OPM shows the proportion of operating profit derived from sales after accounting for production-related expenses (Andrew, 2007).

10. Gross Profit Margin (GPM)

GPM measures how well the company manages its cost of goods sold, enabling comparison across firms in the same industry (Booker, 2006).

RESEARCH METHOD

This study adopts a quantitative descriptive design. Creswell (2014) describes quantitative data as information presented in numerical form, commonly derived from structured documents such as financial statements or statistical records. Within this methodological framework, the analysis employs financial ratio assessment encompassing liquidity ratios (Current Ratio, Quick Ratio, Cash Ratio), solvency ratios (Debt-to-Asset Ratio, Debt-to-Equity Ratio), and activity ratios (Total Asset Turnover, Fixed Asset Turnover, Average Collection Period, Inventory Turnover).

The research utilizes secondary data, specifically the publicly released financial reports of PT Charoen Pokphand Indonesia Tbk for the period 2021–2024, obtained from the official disclosures available through the Indonesia Stock Exchange. These documents form the empirical basis for evaluating the company's financial patterns across the selected years.

The study applies horizontal analysis as its analytical technique. Graybeal (2019) explains that horizontal, or trend, analysis observes financial information over successive periods to identify movements, directional shifts, and recurring tendencies within key financial indicators.

RESULT AND DISCUSSION

1. Liquidity Ratio

The liquidity position of PT Charoen Pokphand Indonesia Tbk over 2021–2024 shows a movement that is not entirely stable, yet it remains within a range that reflects adequate short-term financial capacity. The Current Ratio and Quick Ratio both trended downward from 2021 to 2023, before rising sharply in 2024. A similar pattern appears in the Cash Ratio, which stayed relatively low for three years but improved noticeably in 2024.

Table 1. PT Charoen Pokphand Indonesia Tbk's liquidity position from 2021 to 2024

Ratio	2021	2022	2023	2024	Interpretation
Current Ratio	2,01	1,78	1,65	2,48	Increased
Quick Ratio	1,03	0,89	0,81	1,39	Increased
Cash Ratio	0,23	0,20	0,21	0,52	Increased
Average	1,09	0,96	0,89	1,46	Increased
Compound Annual Growth Rate.				**10,11 %**	

Although these changes reflect some periods of pressure on liquidity, the overall levels still suggest that the company is capable of meeting short-term obligations. Staff (2019) emphasizes that stronger liquidity ratios support a firm's ability to handle immediate liabilities without distress, while Tsokur (2019) notes that sufficient liquidity is an indicator of solid operational footing. In this context, the recovery in 2024 signals that the company restored much of its short-term strength after two years of gradual decline.

2. Solvency Ratio

The solvency indicators demonstrate a temporary rise in leverage during 2022 and 2023, followed by a return to a more conservative structure in 2024. Both the Debt-to-Asset Ratio (DAR) and Debt-to-Equity Ratio (DER) increased in the middle of the period, suggesting heavier reliance on external financing, yet both declined again in 2024 to levels closer to those seen in 2021.

Table 2. PT Charoen Pokphand Indonesia Tbk's solvency position from 2021 to 2024

Ratio	2021	2022	2023	2024	Interpretation
Debt To Asset Ratio	0,29	0,34	0,34	0,29	Decreased
Debt To Equity Ratio	0,41	0,51	0,52	0,41	Decreased
Average	0,35	0,43	0,43	0,35	Decreased
Compound Annual Growth Rate.				**0%**	

Hayes (2019) points out that lower leverage ratios generally indicate a safer long-term financial position, whereas higher ratios expose firms to greater financial risk. Even though the DER values in 2022 and 2023 were higher than optimal benchmarks, Moeller (2012) notes that firms can still operate soundly if they manage their obligations responsibly. Bararuallo (2019) cautions that persistently high leverage may lead to repayment challenges, potentially bringing a company closer to insolvency. With

the reduction in leverage in 2024, the company appears to have strengthened-its long-term solvency and maintained its ability to meet obligations even under liquidation scenarios.

3. Activity Ratio

The activity ratios reflect generally effective utilization of assets, with several positive developments throughout the period. The Total Asset Turnover shows a gradual improvement, especially in 2023 and 2024, indicating enhanced efficiency in generating revenue from total assets. The Fixed Asset Turnover also rises consistently, suggesting productive use of long-term assets.

Table 3. PT Charoen Pokphand Indonesia Tbk's activity position from 2021 to 2024

Ratio	2021	2022	2023	2024	Interpretation
Total Asset Turnover	1,46	1,43	1,50	1,58	Increased
Fixed Asset Turnover	3,18	3,23	3,48	3,99	Increased
Average Age Of Receivables	12,67	13,44	10,83	11,80	Increased
Inventory Turnover	5,69	5,41	5,74	6,09	Increased
Average	5,75	5,87	5,39	5,87	Increased
Compound Annual Growth Rate.				**0,69%**	

The Average Collection Period shortened in 2023—indicating more efficient receivable management—though it rose slightly again in 2024. Meanwhile, the Inventory Turnover ratio increased each year, pointing to faster inventory cycles and better alignment between production and market demand.

McLean (2002) explains that higher turnover ratios generally signal strong operational efficiency and effective income generation. Taken together, the activity ratios illustrate that the company's operating performance remained solid, even though some indicators fluctuated from year to year. Most of the improvements suggest a positive trajectory in asset management.

4. Profitability Ratio

The profitability results show a period of decline followed by a recovery in 2024. The Net Profit Margin, ROA, and ROE weakened between 2021 and 2023, reflecting tighter margins and lower returns. However, all three measures improved in 2024, indicating that profitability began to rebound. The Gross Profit Margin and Operating Profit Margin follow a similar pattern—declining in the middle years but recovering toward the end of the period.

Table 4. PT Charoen Pokphand Indonesia Tbk's profitability position from 2021 to 2024

Ratio	2021	2022	2023	2024	Interpretation
Net Profit Margin	7%	5%	4%	6%	Increased
Return On Asset	10%	7%	6%	9%	Increased
Return On	14%	11%	9%	12%	Increased

Equity					
Gross Profit Margin	16%	16%	13%	15%	Increased
Operating Profit Margin	10%	6%	7%	9%	Increased
Average	11,4%	9%	7,8%	10,2%	Increased
Compound Annual Growth Rate.				**-3,65%**	

According to Kaur (2016), profitability ratios play a crucial role in assessing a company's ability to generate returns for shareholders. Habib (2010) adds that these ratios reflect how well a firm manages both its assets and its cost structure. The downward movement in earlier years suggests pressure on earnings, yet the rebound in 2024 implies improving operational efficiency and better cost control. Overall, the company appears to have regained part of its earning strength by the end of the observation period.

CONCLUSION, IMPLICATION, SUGGESTION, AND LIMITATIONS

1. Conclusion

The analysis of PT Charoen Pokphand Indonesia Tbk over the 2021–2024 period demonstrates that the company's financial condition evolved through phases of pressure and subsequent recovery. The liquidity ratios indicate a temporary weakening in 2022–2023, as reflected in the declining current, quick, and cash ratios. However, the substantial increase observed in 2024 suggests that the company successfully restored its short-term financial capacity, allowing it to meet immediate obligations with a stronger buffer compared to previous years. This improvement also signals better working-capital management at the end of the review period.

The solvency assessment shows a relatively stable capital structure. Although leverage rose slightly during 2022 and 2023, both the Debt-to-Asset and Debt-to-Equity ratios returned to their earlier levels in 2024. This pattern indicates that the company did not disproportionately increase its long-term commitments and maintained a prudent financing posture. The stability of these ratios suggests that the firm remained capable of fulfilling long-term obligations without facing significant solvency risk.

From the activity perspective, improvements were evident in asset utilization. The upward trend in Total Asset Turnover and Fixed Asset Turnover—especially in 2024—reflects a more effective use of the firm's asset base in generating sales. Inventory Turnover also strengthened throughout the period, showing enhanced inventory control. Although the average age of receivables fluctuated, the variations remained within a manageable range and did not indicate a persistent issue in collection efficiency.

Profitability ratios show that the company experienced its weakest financial performance during 2022–2023, as seen from the decline in Net Profit Margin, ROA, ROE, GPM, and OPM. These decreases may indicate rising operational costs or a less favorable market environment. Nevertheless, the recovery of all profitability indicators in 2024 suggests that corrective measures were implemented effectively, enabling the company to restore part of its earning capacity.

Overall, the ratio analysis indicates that PT Charoen Pokphand Indonesia Tbk remains financially resilient. Despite short-term pressures, the company demonstrated an ability to stabilize liquidity, maintain solvency,

improve operational efficiency, and gradually recover profitability. These results highlight a capacity to adapt to changing conditions and preserve financial performance over time.

2. Implication

This study is expected to offer practical and scholarly value, particularly in strengthening the understanding and application of financial ratio analysis within the context of PT Charoen Pokphand Indonesia Tbk. The key implications derived from the results are as follows:

A. The findings provide management with a clearer basis for evaluating the company's financial performance. This evaluation can support decisions related to capital structure, financing choices, and strategic adjustments aimed at improving operational and financial outcomes in subsequent periods.
B. The results may serve as a useful reference for stakeholders, particularly investors and creditors, by offering financial insights that can inform investment considerations and risk assessments regarding PT Charoen Pokphand Indonesia Tbk.
C. The analysis also contributes structured financial information covering the company's performance during 2021–2024. This data can be utilized as comparative material for future studies or internal assessments involving similar financial indicators.
D. Finally, this research provides additional insight into the financial performance characteristics of firms operating in the livestock and poultry-feed sector listed on the Indonesia Stock Exchange. The findings may help enhance the broader understanding of financial dynamics within this industry.

3. Limitation

The primary limitation of this study lies in its timing. The ratio analysis for PT Charoen Pokphand Indonesia Tbk was conducted in November 2025, while the financial data for the 2025 fiscal year had not yet been fully completed. As a result, the quarterly figures available for 2025 could not be compared meaningfully with the ratios from 2021–2024, as the year-end financial statements for 2025 remain subject to change until- the official closing in December 2025. This condition may affect the completeness and comparability of the financial trends observed.

4. Recommendation

Below are recommendations that researcher proposed in line with potential benefits that this study may offer to various parties:

A. For Company

PT Charoen Pokphand Indonesia Tbk is encouraged to utilize the findings of this study as an additional reference when evaluating investment-related policies. Strengthening internal decision-making informed by financial ratio trends may help the company enhance its operational efficiency and overall financial performance, thereby improving its attractiveness to both existing and prospective investors.

B. For Future Researchers

Future research is advised to employ alternative analytical indicators or methodological approaches to generate more comprehensive insights and to minimize limitations similar to those encountered in this study.

C. For Investors

Investors are encouraged to carefully examine financial trends and risk conditions before making investment decisions. The results of this study may serve as one of several considerations when evaluating the financial condition and future prospects of PT Charoen Pokphand Indonesia Tbk. A thoughtful assessment will help ensure that investment choices remain aligned with expected returns and individual risk preferences.

REFERENCES

Agustina, T. R., & L. (2018). The effect of financial ratios on financial distress conditions in sub-industrial sector company. Accounting Analysis Journal, 7(1), 25–33.

Alamry, S. C. M. (202 (Jacky)0). Analysis of financial statements. Iraq.

Andrew, G., & J. D. (2007). Financial management: Principles and practice. Freeload Press.

Bararuallo, F. (2019). Pengantar bisnis: Prinsip, konsep, teori, dan strategi (K. Sihotang, Ed.). Universitas Katolik Indonesia Atma Jaya.

Booker, J. (2006). Financial planning fundamentals: CFP education program course 1 (H. B. Jill Booker, Ed.). CCH Canadian Limited.

Bragg, S. M. (2007). Business ratios and formulas: A comprehensive guide. John Wiley & Sons.

Brigham, E. F., & Houston, J. F. (2009). *Dasar-dasar manajemen keuangan* (10th ed.). Salemba Empat.

Brigham, E. F., & Houston, J. F. (2018). *Dasar-dasar manajemen keuangan* (14th ed.). Salemba Empat.

Clyde Stickney, R., Weil, K., Schipper, K., & Francis, J. (2009). Financial accounting: An introduction to concepts, methods and uses (R. Dewey, Ed.). Cengage Learning.

E. A. Osadchy, E. M. A., Amirova, E. F., Bochkareva, T. N., Gazizyanova, Y. Y., & Yumashev, A. V. (2018). Financial statements of a company as an information base for decision-making in a transforming economy. European Research Studies Journal, 21(2), 339–350.

Endri, E., Zaenal Abidin, Z., & Riyanto, S. (2019). Effect of financial performance on stock return: Evidence from the food and beverages sector. International Journal of Innovation, Creativity and Change, 9(10), 335–350.

Engle, C. R. (2010). Aquaculture economics and financing: Management and analysis. Wiley-Blackwell.

Maulidya, E. W. S., Suyono, A. S., Suyono, J., & Ratnasahara, D. E. (2019). Analysis of financial performance based on financial ratio and economic value added (Case study: PT Unilever Indonesia Tbk). International Journal of Integrated Education, Engineering and Business, 115–122.

Gibson, C. H. (2013). Financial statement analysis. South-Western Cengage Learning.

Goel, S. (2014). Financial statements analysis: Cases from corporate India. Routledge.

Habib, M. A., & H. (2010). Performance evaluation and ratio analysis of pharmaceutical company in Bangladesh. University West.

Halim, A. (2007). Local finance public sector accounting. Salemba Empat.

Hayes, A. (2019). Debt ratio definition. Investopedia..

Jain, K., & Jain, P. K. (2007). Financial management (T. K. Maji, Ed.). Tata McGraw-Hill.

James, M. (2020). Return on assets (ROA). Investopedia.

Kaur, S. (2016). Ratio analysis. Imperial Journal of Interdisciplinary Research, 2(2), 2083–2092.

Kusuma, R. A. (2018). Pengertian rasio aktivitas – Jenis, rumus, dan contoh. Dosen Akuntansi.

McLean, R. (2002). Financial management in health care organizations. Cengage Learning.

Mehta, V. (2018). What is the importance of financial management? London School of Business & Finance.

Moeller, S. (2012). Finance essentials: The practitioner's guide. Bloomsbury.

Murphy, C. B. (2020). Financial statements. Investopedia.

Nuhu, M. (2014). Role of ratio analysis in business decisions: A case study of NBC Maiduguri Plant. Journal of Educational and Social Research, 4(5), 105–118.

Graybeal, P., Franklin, M., & Cooper, D. (2019). Principles of accounting: Managerial accounting (Vol. 2). OpenStax.

Rao, P. M. (2011). Financial statement analysis and reporting. PHI Learning.

Sari, R. P., H. T., & Turino. (2018). Analysis of financial performance in public sector (A case study in Lamongan, East Java–Indonesia). Journal of Accounting and Strategic Finance, 1(1), 82–90.

Sharan, V. (2009). Fundamentals of financial management. Dorling Kindersley.

Sharma, R. K. (2020). Ratio analysis: Financial ratios. Amazon Digital Services LLC.

Sinha, G. (2012). Financial statement analysis. PHI Learning Private Limited

Sultan, A. S. (2014). Financial statements analysis—Measurement of performance and profitability: Applied study of Baghdad Soft-Drink Industry. Research Journal of Finance and Accounting, 5(4), 52–60.

T. Rizky, A., H. M., & L. (2009). Successful financial planner: A complete guide. Grasindo.

Tsokur, M. (2019). Solvency vs. liquidity: What do these accounting terms mean? Scale Factor.

Wachowicz, J. M., & Van Horne, J. C. (2009). Fundamentals of financial management: Prinsip-prinsip manajemen keuangan (Buku 1, 13th ed.). Salemba Empat.

Wagner, M. (2003). How does it pay to be green? An analysis of the relationship between environmental and economic performance at the firm level and the influence of corporate environmental strategy choice. Tectum Verlag.

Webb, M., & K. A. R. (2010). A financial ratio analysis of commercial bank performance in South Africa. African Review of Economics and Finance, 2(1), 39.

Whiteley, J. (2017). Mastering financial management (R. Pettinger, Ed.). Macmillan International Education.

Megginson, W. L., Lambrecht, B. M., & Smart, S. B. (2008). Introduction to corporate finance (L. Dawson-Bowling, Ed.). Patrick Bond.

CHAPTER 3
Measuring Financial Performance of PT Bukit Asam Tbk during Declining Export Demand & Global Headwinds

Ferdinan SIHOMBING
Institute IPMI, Indonesia
ferdinan.sihombing@ipmi.ac.id
Orcid: 0009-0000-1033-9364

Wiwiek Mardawiyah DARYANTO
Institute IPMI, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-35825857

Jerry The NALLEY
Institute IPMI, Indonesia
jerry.nalley@ipmi.ac.id
Orcid: 0009-0005-9127-5740

ABSTRACT

PT Bukit Asam Tbk (PTBA) is one of Indonesia's leading coal producers that plays a critical role in the national energy supply chain and economic development. Operating primary in south Sumatera, PTBA contributes substantially to domestic coal production and export revenue. However, the coal industry faces challenges such as declining demand, market volatility and stricter global environmental regulations and the growing transition toward renewable energy sources. In response the issues, PT Bukit Asam Tbk, has initiated strategic transformations focusing on operational efficiency, downstream coal development, and renewable energy integration. This study aims to analyze and measure the financial performance and capital structure efficiency of PTBA during the period 2020–2024. The analysis is based on secondary data obtained from audited financial statements, annual reports, and public disclosures available on the Indonesia Stock Exchange (IDX). The research methodology used was financial ratio analysis, which was classified into profitability, liquidity, activity, and solvency ratios.
Keywords: Financial Performance, Coal Industries, Coal Production, Coal Demand

INTRODUCTION

The coal industry remains one of Indonesia's most strategic economic pillars, contributing significantly to national energy security, export revenues, and fiscal income. As global commodity markets experience heightened volatility, Indonesian coal producers are increasingly exposed to fluctuations in demand, pricing dynamics, and structural shifts driven by decarbonization policies. In recent years, the global coal market has entered a period of heightened uncertainty, marked by declining export demand, stricter environmental regulations, and accelerating transitions toward renewable energy sources in key importing countries. These global headwinds have directly affected Indonesia's coal sector, including PT Bukit Asam Tbk (PTBA), one of the nation's largest and most integrated state-owned coal mining companies.

PTBA plays a critical role in Indonesia's domestic energy ecosystem through vertically integrated operations that encompass mining, transportation, and power generation. Despite this strong position, the company faces mounting challenges. Export volumes have weakened amid falling international benchmark prices, logistic bottlenecks, particularly railway capacity constraints, and market hesitation linked to the premium gap between the Indonesian coal reference price (HBA) and spot market indices. At the same time, domestic production has been disrupted by adverse weather conditions, fuel cost escalation related to the B40 biodiesel mandate, and regulatory changes such as the 100% Domestic Foreign Exchange (DHE) repatriation policy. These headwinds have contributed to declining profitability across the sector, including PTBA's substantial contraction in net income beginning in 2023-2024.

Despite these external pressures, PTBA has undertaken strategic initiatives to maintain resilience, including cost efficiency programs, downstream coal development, and gradual diversification toward renewable energy projects. Nevertheless, the company's financial performance reveals a mixed trend: exceptionally strong gross margins in 2023-2024 driven by operational efficiency, but tightening liquidity due to rising operating costs, large dividend distributions during the coal supercycle, and increasing short-term obligations. Meanwhile, solvency ratios remain exceptionally strong, reflecting PTBA's conservative capital structure and minimal reliance on debt financing.

Given these dynamics, it becomes essential to examine how PTBA has navigated the period of declining export demand and global market turbulence. Measuring the firm's financial performance during 2020-2024 provides critical insight into its operational strength, capital structure efficiency, and the sustainability of its profitability under evolving industry conditions. This study aims to analyze PTBA's financial performance using key financial ratio categories, profitability, liquidity, activity, and solvency, based on audited financial statements, annual reports, and publicly available disclosures from the Indonesia Stock Exchange (IDX). The findings are expected to provide a comprehensive understanding of PTBA's financial resilience and strategic positioning within Indonesia's coal industry amid a rapidly changing global energy landscape.

LITERATURE REVIEW

2.1 Theoretical Foundation

2.1.1 Financial Performance Theory

Financial performance refers to an organization's ability to generate profit, manage resources efficiently, and sustain operational and financial stability over time. According to Brigham & Houston (2019), financial performance is commonly measured using ratio analysis to evaluate profitability, liquidity, activity, and solvency. Meanwhile, Gitman & Zutter (2021) emphasize that the financial performance of firms in

commodity-based industries is highly sensitive to external conditions, including price volatility, supply–demand shocks, and regulatory dynamics.

1. Financial performance analysis serves multiple purposes:
2. Assessing operational efficiency
3. Evaluating strategic decision-making outcomes
4. Monitoring corporate stability and risk exposure
5. Supporting stakeholders in investment decision-making

This theoretical foundation is essential for understanding PT Bukit Asam Tbk's performance during periods of declining export demand and global uncertainty.

2.1.2 Financial Ratio Analysis

Financial ratio analysis is the primary tool used to evaluate a firm's financial health. Ross, Westerfield & Jordan (2020) group financial ratios into four categories:

1. Profitability Ratios
   Indicate the firm's ability to generate profit relative to sales, assets, or equity.
   a. Gross Profit Margin (GPM)
   b. Operating Margin (OM)
   c. Net Profit Margin (NPM)
   d. Return on Assets (ROA)
   e. Return on Equity (ROE)

2. Liquidity Ratios
   Evaluate the firm's ability to meet short-term obligations.
   a. Current Ratio
   b. Quick Ratio
   c. Cash Ratio

3. Activity Ratios (Efficiency Ratios)
   Measure how effectively the firm manages its assets.
   a. Inventory Turnover
   b. Receivables Turnover
   c. Total Asset Turnover
   d. Cash Conversion Cycle (CCC)

4. Solvency Ratios
   Reflect long-term debt capacity and financial risk.
   a. Debt-to-Equity Ratio (DER)
   b. Interest Coverage Ratio

These ratios provide a quantitative framework to analyze PTBA's performance across different financial dimensions.

2.1.3 Capital Structure Theory

Capital structure decisions influence a firm's risk, cost of capital, and long-term sustainability. Key theories include:

1. Modigliani–Miller Theory (1958)
   Proposes that capital structure is irrelevant in perfect markets; firm value depends solely on operating income.
2. Trade-off Theory (Myers, 1984)
   Firms balance tax benefits of debt with bankruptcy costs to determine optimal leverage.
3. Pecking Order Theory (Myers & Majluf, 1984)
   Firms prioritize internal financing, then debt, and lastly equity.
4. Agency Cost Theory (Jensen & Meckling, 1976)
   Highlights conflicts between shareholders and managers, influencing financing choices.

PTBA operates with exceptionally low debt levels, making it an example of conservative capital structure aligned with pecking order behavior, where internal cash flows dominate financing.

2.2 Industry and Market Dynamics

2.2.1 Overview of the Global Coal Industry

The global coal market is shaped by interactions among supply, demand, energy policies, industrial usage, and geopolitical disruptions. IEA (2023) notes several key trends:

1. Demand is declining in OECD countries due to renewable energy adoption.
2. Asia, particularly China and India, remains the largest consumer of thermal coal.
3. Environmental regulations and carbon pricing mechanisms increase operational costs.
4. Market volatility is driven by global energy shocks, weather anomalies, and transport disruptions.

Global coal prices (HBA, ICI indices) significantly influence the profitability of coal exporters such as PTBA.

2.2.2 Indonesian Coal Industry

Indonesia is one of the world's top coal exporters. The sector is overseen by:

1. Ministry of Energy and Mineral Resources (ESDM)
2. Indonesian Coal Benchmark Price (HBA) regulations
3. Domestic Market Obligation (DMO) rules
4. Mineral and coal fiscal policies (royalties, PNBP)

Key industry characteristics:

1. High exposure to global price cycles
2. Dependence on weather stability
3. Large logistical constraints, particularly rail capacity
4. Increasing pressure to decarbonize

This context directly affects PTBA's sales, production levels, and strategic direction.

2.2.3 Energy Transition and Its Implications

Global commitments such as the Paris Agreement and national net-zero roadmaps create structural risks for coal producers. Literature highlights:

1. Declining long-term thermal coal demand (World Bank, 2023)

2. Shift to renewable energy investments
3. Investor restrictions on fossil fuel financing

These transitions influence PTBA's strategy, including diversification into mine-mouth power plants and renewable energy initiatives.

2.3 Corporate Performance in Commodity Industries

2.3.1 Commodity Price Cycles

Commodity industries follow boom-and-bust cycles influenced by:

1. Supply-demand imbalances
2. Cost shocks
3. Speculation and geopolitical events
4. Transportation and logistic constraints

Schwartz & Smith (2000) explain that commodity prices exhibit high volatility and mean reversion, affecting revenue stability for mining companies.

PTBA experienced significant margin swings during:

1. The coal supercycle (2021–2022)
2. Post-supercycle normalization (2023–2024)

2.3.2 Operational Efficiency in Mining Firms

Empirical studies emphasize:

1. Inventory turnover is affected by export demand fluctuations
2. Working capital management is essential for cash preservation
3. Downstream integration contributes to cost control
4. Transportation bottlenecks can weaken sales realization

PTBA's 2024 data reflects these dynamics through improved CCC but weaker inventory efficiency.

2.3.3 Liquidity and Dividend Policies

Research shows that mining firms with high cash flows tend to distribute large dividends (Fama & French, 2001). During commodity booms:

1. Companies accumulate high cash
2. Dividend payouts increase
3. Liquidity strengthens

Post-supercycle, PTBA faces:

1. Declining liquidity
2. Higher short-term obligations
3. Need to preserve cash for capex and rail expansion

2.3.4 Solvency and Risk Management

Mining firms often adopt low leverage due to:

1. High business risk

2. Exposure to price volatility
3. Regulatory uncertainty
4. Capital-intensive operations

PTBA's debt-to-equity ratio below 10% aligns with best practices for commodity firms prioritizing stability over aggressive expansion.

2.4 Previous Studies

2.4.1 Studies on Financial Performance of Mining Firms

Prior research includes:

1. Mulyani et al. (2021): Profitability of Indonesian coal firms is heavily driven by global benchmark prices.
2. Siregar (2020): Liquidity ratios decline when companies expand capex or increase dividend distribution.
3. Yulianto & Harjito (2019): Activity ratios and inventory turnover correlate with export performance.
4. Prasetyo (2022): Solvency ratios in state-owned mining firms are typically conservative due to government oversight.

2.4.2 Studies on Coal Industry Dynamics

1. IEA (2023): Coal demand faces structural decline but remains stable in Asia.
2. ESDM Annual Reports (2020-2024): Domestic production is vulnerable to weather disruptions and logistic constraints.
3. World Bank Commodity Outlook (2024): Price normalization is expected after the 2021–2022 spike.

2.4.3 Gaps in the Literature

Despite numerous studies, there remains a gap in analyzing:

1. Integrated financial performance during simultaneous export decline and global macro headwinds.
2. The interplay between liquidity tightening and profitability normalization in Indonesian state-owned coal firms.
3. Post-supercycle financial resilience, particularly in low-leverage firms such as PTBA.

This study addresses these gaps by evaluating PTBA's financial performance over 2020–2024 using comprehensive ratio analysis.

2.5 Conceptual Framework

The conceptual model integrates:

1. External pressures: global price volatility, export decline, environmental regulations
2. Internal financial indicators: profitability, liquidity, activity, solvency
3. Strategic responses: downstreaming, cost efficiency, diversification

Independent Variables:

1. Market conditions
2. Operational efficiency
3. Capital structure

Dependent Variable:

1. Financial performance of PTBA (2020–2024)
2. This framework forms the analytical basis for examining PTBA's resilience amid global headwinds.

This framework forms the analytical basis for examining PTBA's resilience amid global headwinds.

METHODOLOGY

3.1 Research Design

This study adopts a **quantitative descriptive research design** aimed at systematically analyzing PT Bukit Asam Tbk's financial performance during 2020–2024. A quantitative descriptive approach is appropriate because it:

1. Measures financial ratios based on numerical data
2. Describes trends and changes over time
3. Evaluates financial health using objective financial indicators
4. Provides empirical insights grounded in audited datasets

According to Creswell (2018), descriptive quantitative research is suitable when the purpose is to "describe, explain, or summarize numeric data related to specific variables." In this study, the variables include financial ratios grouped into profitability, liquidity, activity, and solvency.

3.2 Research Approach

The study uses a **secondary data approach** because all data originate from official company documents and publicly available reports. Sekaran & Bougie (2020) explain that secondary data research is commonly used in financial performance studies because it is:

1. Accurate (derived from audited sources)
2. Efficient (accessible through public disclosures)
3. Comparable across years
4. Reliable for time-series analysis

The research employs a **time-series analytical approach**, examining financial statements over a five-year period from 2020 to 2024. Time-series analysis allows identification of patterns, fluctuations, and trends influenced by macroeconomic and industry conditions.

3.3 Data Sources

3.3.1 Primary Data

This research does **not use primary data**, as no surveys, interviews, or direct observations were conducted. Financial performance analysis relies exclusively on financial documents.

3.3.2 Secondary Data

Secondary data were obtained from:

1. PTBA Audited Financial Statements (2020–2024)
2. PTBA Annual Reports (2020–2024)
3. Indonesia Stock Exchange (IDX) Public Disclosures

4. Financial press releases and investor briefings
5. ESDM Coal Benchmark Price (HBA) publications
6. World Bank & IEA commodity outlook reports **(for contextual macro data)**
7. OJK & Ministry of Finance regulatory publications

Using multiple data sources strengthens data validity (Saunders, Lewis & Thornhill, 2019) through triangulation.

3.4 Population and Sample

3.4.1 Population

The population includes **all publicly listed coal mining companies in Indonesia** reporting financial statements during 2020-2024.

3.4.2 Sample

This study uses a **purposive sampling method**, selecting **PT Bukit Asam Tbk (PTBA)** as the research subject based on the following criteria:

1. A state-owned enterprise with a major role in domestic energy supply
2. Availability of complete audited financial data for 2020–2024
3. Significant exposure to export markets
4. Company experiencing measurable impacts from global coal demand fluctuations

Purposive sampling is appropriate when the research requires a "rich, information-intensive unit" (Patton, 2015).

3.5 Data Collection Procedure

The data collection includes the following steps:

1. Downloading PTBA's financial statements from IDX
2. Extracting key financial components:
    a. Income Statement
    b. Balance Sheet
    c. Cash Flow Statement
3. Organizing financial variables into ratio components
4. Validating numerical accuracy against audited reports
5. Creating time-series data from 2020 to 2024

In addition, industry and macroeconomic references were collected to strengthen analysis validity.

3.6 Variables and Operational Definitions

This study uses **four categories of financial ratios** as dependent variables, referring to established financial literature (Brigham & Houston, 2019; Gitman & Zutter, 2021).

3.6.1 Profitability Ratios

Used to measure PTBA's ability to generate profit.

1. **Gross Profit Margin (GPM)**
   GPM = Gross Profit / Revenue
2. **Net Profit Margin (NPM)**
   NPM = Net Income / Revenue

3. **Return on Assets (ROA)**
   ROA = Net Income / Total Assets
4. **Return on Equity (ROE)**
   ROE = Net Income / Total Equity

3.6.2 Liquidity Ratios

Measure the company's ability to meet short-term obligations.

1. **Current Ratio (CR)**
   CR = Current Assets / Current Liabilities
2. **Quick Ratio (QR)**
   QR = (Current Assets – Inventory) / Current Liabilities
3. **Cash Ratio (CaR)**
   CaR = (Cash and Cash Equivalents / Current Liabilities

3.6.3 Activity Ratios

Evaluate the efficiency of asset utilization.

1. **Inventory Turnover (ITO)**
   ITO = COGS / Average Inventory
2. **Receivable Turnover (RTO)**
   RTO = Net Sales / Accounts Receivable
3. **Total Asset Turnover (TATO)**
   TATO = Net Sales / Total Assets
4. **Cash Conversion Cycle (CCC)**
   CCC = DIO + DSO - DPO

3.6.4 Solvency Ratios

Indicate long-term financial stability.

1. **Debt-to-Equity Ratio (DER)**
   DER = Total Liabilities / Total Equity
2. **Interest Coverage Ratio (ICR)**
   ICR = EBIT / Interest Expense

These operational definitions ensure transparency and replicability.

3.7 Data Analysis Technique

3.7.1 Ratio Analysis Technique

Ratio analysis is used to evaluate year-to-year financial condition. The analysis follows the framework of:

1. Brigham & Houston (2019)
2. Gitman & Zutter (2021)
3. Ross, Westerfield & Jordan (2020)

Steps include:

1. Computing financial ratios for each year (2020–2024)
2. Comparing ratios against industry norms
3. Identifying deviations during declining export demand
4. Linking external factors (weather, logistics, policy changes, prices) to financial outcomes

3.7.2 Time-Series Trend Analysis

Time-series analysis helps identify:

1. Patterns
2. Volatility
3. Pre- and post-supercycle variations
4. Impact of external shocks (fuel costs, B40, HBA pricing, export decline)

This approach is aligned with Gujarati & Porter (2009), who state that time-series data reveal structural changes over time.

3.8 Validity and Reliability

3.8.1 Validation of Financial Data

1. All financial data are **audited**, ensuring accuracy.
2. Cross-referenced with IDX disclosures.
3. Triangulated using annual reports and investor presentations.

3.8.2 Reliability

Financial ratios maintain high reliability because:

1. Calculation formulas are standardized internationally.
2. Data sources are consistent across all years.
3. Audited statements reduce measurement errors.

According to Sekaran (2016), secondary financial data have "inherently high reliability due to regulatory compliance."

3.9 Research Limitations

This study acknowledges several limitations:

1. **Single-company focus** limits generalizability.
2. **Financial ratios only**, non-financial performance (CSR, ESG, operational KPIs) is excluded.
3. **External variables (coal prices, policy changes, weather)** are not mathematically modeled.
4. **Five-year period** may not capture full long-term structural impacts of energy transition.

Nevertheless, the methodology remains valid and robust for analyzing PTBA's financial performance.

3.10 Ethical Considerations

1. All data used are publicly available, ensuring compliance with research ethics.
2. No confidential or insider information is used.
3. Citations follow academic integrity standards.

INTERPRETATION OF RESULT

4.1 Interpretation of Profitability Ratios

	2019	2020	2021	2022	2023	2024
Profitability Ratios						
Gross Profit Margin (GPM)	65.1%	73.6%	53.9%	57.9%	76.2%	80.8%
EBIT Margin	23.0%	14.5%	34.0%	35.5%	18.7%	13.2%
Net Profit Margin (NPM)	18.5%	13.9%	27.5%	30.0%	16.3%	12.0%
ROA	15.5%	10.0%	22.2%	28.2%	16.2%	12.3%
ROE	21.9%	14.2%	33.1%	44.2%	29.2%	22.7%

4.1.1 Gross Profit Margin (GPM)

PTBA's GPM shows exceptionally strong performance, especially in 2023 and 2024 (76.2% → 80.8%). This improvement reflects:

1. Successful implementation of cost-efficiency programs
2. Lower production costs supported by efficient mining operations
3. A healthier product mix and higher-margin domestic sales

Despite weakening coal prices globally, PTBA managed to sustain strong gross margins, indicating robust internal cost control.

4.1.2 Net Profit Margin (NPM)

NPM experienced a sharp decline after its 2021–2022 peak from 30.0% (2022) → 16.3% (2023) → 12.0% (2024).
This decline is primarily driven by:

1. The normalization of coal prices after the 2021–2022 supercycle
2. Higher logistics costs due to rail and port capacity limitations
3. Increased fuel costs linked to the B40 biodiesel mandate
4. Declining export volumes

Although PTBA maintains profitability, external pressures have significantly reduced net margins.

4.1.3 Return on Assets (ROA) and Return on Equity (ROE)

Both ROA and ROE followed by the coal price cycle:

1. High profitability during the supercycle lifted returns
2. Declining coal prices and higher operating costs reduced profitability in 2023–2024

Profitability remains solid but shows a downward trend as global market conditions deteriorate.

4.2 Interpretation of Liquidity Ratios

	2019	**2020**	**2021**	**2022**	**2023**	**2024**
Liquidity Ratios						
Current Ratio	2.5	2.2	2.4	2.3	1.5	1.3
Quick Ratio	1.6	1.6	2.2	1.9	0.9	0.8
Cash Ratio	1.0	1.1	0.6	0.7	0.4	0.3

4.2.1 Current Ratio dan Quick Ratio

PTBA's liquidity ratios show a continuous decline between 2021 and 2024:

1. Current Ratio: 2.4 (2021) → 1.3 (2024)
2. Quick Ratio: 2.2 (2021) → 0.8 (2024)

The tightening liquidity is caused by:

1. Decreasing cash reserves due to weaker coal prices
2. Rising short-term liabilities to support operational needs
3. High dividend payouts during the supercycle, reducing cash buffers

4.2.2 Cash Ratio

The Cash Ratio dropped to 0.3 in 2024, meaning PTBA's cash reserves alone are insufficient to cover current liabilities without relying on receivables or inventory.

4.3 Interpretation of Activity Ratios

	2019	**2020**	**2021**	**2022**	**2023**	**2024**
Activity Ratios						
Account Receivable Turnover	6.02	5.27	8.73	9.46	8.33	10.00
Inventory Turnover	10.25	11.66	15.68	9.79	6.28	6.67
Payables Turnover	13.90	14.86	16.04	15.40	14.60	13.82
Day Receivable Outsanding	60.64	69.31	41.83	38.59	43.80	36.49
Day Inventory Outstanding	26.27	24.57	22.76	23.71	25.00	26.41
Cash Conversions Cycle	60.64	69.31	41.83	38.59	43.80	36.49

4.3.1 Account Receivable Turnover and Days Receivable Outstanding

Account Receivable Turnover improved to 10x in 2024 and Day Receivable Outstanding shortened to 36.49 days means :

1. PTBA is increasingly efficient in collecting receivables
2. Domestic customers likely contribute to faster collection cycles
3. The company's credit policy appears more disciplined

4.3.2 Inventory Turnover and Days Inventory Outstanding (DIO)

Inventory Turnover decreased significantly (10.25 → 6.67) and DIO increased to 26.41 days means:

1. Coal inventory takes longer to be sold due to declining export demand
2. Logistic constraints (rail bottlenecks & port congestion) reduced inventory movement
3. Higher inventory days increase holding costs

4.3.3 Cash Conversion Cycle (CCC)

The CCC shows significant improvement over the six-year period, reflecting PTBA's ongoing efforts to strengthen operational efficiency in response to industry pressures and market volatility.

4.4 Interpretation of Solvency Ratios

	2019	2020	2021	2022	2023	2024
Solvency Ratio						
Debt-to-Assets	2.4%	3.9%	2.9%	3.0%	3.4%	5.4%
Debt-to-Equity	3.4%	5.5%	4.3%	4.7%	6.0%	9.9%
Interest Coverage (Annual)	-	19.02	62.86	75.65	35.30	19.92

4.4.1 Debt-to-Equity Ratio (DER) and Debt-to-Assets

PTBA maintains a very conservative capital structure:

1. DER is only 0.1 (2024)
2. Total Debt-to-Assets remains below 6%

PTBA exhibits minimal financial risk. The company relies mainly on internal funding rather than external debt

4.4.2 Interest Coverage Ratio (ICR)

ICR remains high at 19.92× (2024), indicating:

1. Strong ability to meet interest obligations
2. Limited exposure to rising interest rate risks
3. Ample room for leveraging if needed for future projects

PTBA demonstrates excellent solvency with extremely low financial risk and strong long-term stability.

Overall Conclusion

The financial performance of PTBA during 2019–2024 reflects a company that remains fundamentally strong despite facing global coal price normalization, declining export demand, and rising operational challenges. Key takeaways include:

1. Profitability remains solid but is trending downward due to weakening market conditions.
2. Liquidity has deteriorated, signaling the need for more prudent cash and working capital management.

3. Operational efficiency is mixed, with improving receivable turnover but weakening inventory and CCC performance.
4. Solvency remains exceptionally strong, with PTBA operating under an ultra-low debt structure, ensuring long-term financial stability.

Overall, PTBA demonstrates high resilience, supported by efficient operations and conservative leverage. However, to sustain long-term growth amid global energy transition and declining coal demand, PTBA must prioritize:

1. Strengthening liquidity buffers
2. Enhancing logistical and operational efficiency
3. Accelerating diversification into value-added coal products and renewable energy
4. Improving export competitiveness and expanding domestic demand channels

PTBA's strategic shift toward downstreaming and renewable energy will be critical in ensuring sustainability in a rapidly changing global energy landscape.

REFERENCE

Academic Books & Foundational Theories

Brigham, E. F., & Houston, J. F. (2019). Fundamentals of financial management (15th ed.). Cengage Learning.
Creswell, J. W. (2018). Research design: Qualitative, quantitative, and mixed methods approaches (5th ed.). SAGE Publications.
Gitman, L. J., & Zutter, C. J. (2021). Principles of managerial finance (15th ed.). Pearson.
Gujarati, D. N., & Porter, D. C. (2009). Basic econometrics (5th ed.). McGraw-Hill.
Jensen, M. C., & Meckling, W. (1976). Theory of the firm: Managerial behavior, agency costs, and ownership structure. Journal of Financial Economics, 3(4), 305–360.
Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporation finance, and the theory of investment. The American Economic Review, 48(3), 261–297.
Myers, S. C. (1984). The capital structure puzzle. The Journal of Finance, 39(3), 575–592.
Myers, S. C., & Majluf, N. (1984). Corporate financing and investment decisions when firms have information that investors do not have. Journal of Financial Economics, 13(2), 187–221.
Ross, S. A., Westerfield, R. W., & Jordan, B. D. (2020). Essentials of corporate finance (10th ed.). McGraw-Hill Education.
Saunders, M., Lewis, P., & Thornhill, A. (2019). Research methods for business students (8th ed.). Pearson.
Sekaran, U., & Bougie, R. (2020). Research methods for business: A skill-building approach (8th ed.). Wiley.
Patton, M. Q. (2015). Qualitative research & evaluation methods (4th ed.). SAGE Publications.

Industry Reports, Coal Market Studies & Global Data

International Energy Agency (IEA). (2023). Coal 2023: Analysis and forecast to 2028. OECD/IEA.
World Bank. (2024). Commodity markets outlook: Cyclical and structural drivers of mineral and energy prices. World Bank Group.
Ministry of Energy and Mineral Resources (ESDM). (2020–2024). Indonesia's coal benchmark price (HBA) monthly reports. Directorate General of Mineral and Coal.
Ministry of Energy and Mineral Resources (ESDM). (2024). Handbook of energy & economic statistics of Indonesia. Government of Indonesia.
OECD. (2023). Global energy transitions and emerging market vulnerabilities. OECD Publishing.
Empirical Studies on Mining, Coal, and Financial Ratios
Fama, E. F., & French, K. R. (2001). Disappearing dividends: Changing firm characteristics or lower propensity to pay? Journal of Financial Economics, 60(1), 3–43.
Mulyani, S., Kurniawan, R., & Prasetyo, A. (2021). Determinants of profitability in Indonesian coal mining companies. Jurnal Manajemen dan Kewirausahaan, 23(2), 112–120.
Prasetyo, R. (2022). Capital structure and financial performance of state-owned mining enterprises in Indonesia. Indonesian Journal of Business and Economics, 7(1), 45–57.
Siregar, H. (2020). Liquidity, leverage, and profitability dynamics in Indonesian energy and mining firms. Jurnal Ekonomi dan Keuangan, 4(3), 201–214.
Yulianto, A., & Harjito, D. (2019). Working capital management and firm value in commodity-based industries: Evidence from Indonesia. Jurnal Keuangan dan Perbankan, 23(2), 278–290.

Schwartz, E. S., & Smith, J. E. (2000). Short-term variations and long-term dynamics in commodity prices. Management Science, 46(7), 893–911.

PT Bukit Asam Tbk (PTBA) Corporate Documents

PT Bukit Asam Tbk. (2020–2024). Annual report. PTBA Corporate Communications & Investor Relations.
PT Bukit Asam Tbk. (2020–2024). Audited financial statements. Indonesia Stock Exchange (IDX).
Indonesia Stock Exchange (IDX). (2024). PTBA public disclosures and financial highlights. https://www.idx.co.id
Ministry of State-Owned Enterprises (BUMN). (2023). MIND ID strategic roadmap. Government of Indonesia.

CHAPTER 4
The Financial Distress Analysis of PT Wijaya Karya (Persero), Tbk. for Period of 2020-2024

Rubiyati INAYAH
IPMI Institute, Indonesia
rubiyati.inayah@ipmi.ac.id
Orcid: 0009-0009-2486-9732

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

Ammara Rania PANE
IPMI Institute, Indonesia
ammara.pane@ipmi.ac.id
Orcid: 0009-0006-7349-2052

ABSTRACT

This study analyzes the financial distress condition of PT Wijaya Karya (Persero), Tbk (WIKA) for period 2020 – 2024 using the Altman Z-Score model as the primary analytical tool. The objective is to evaluate the company's financial stability, identify potential bankruptcy risk, and assess the effectiveness of its financial management amid challenging economic conditions. The findings reveal that WIKA consistently remained in the Distress Zone throughout five-year period, with Z-Scores ranging from 0.40 to 0.73 in 2020, 2021, 2022, and 2024 far below the threshold of 2.6 that indicates financial health. The most critical condition occurred in 2023 when WIKA recorded Z-Score of (1.73), placing the company in the Severe Distress Zone. This sharp decline reflects serious financial strain driven by substantial losses, project delays, and high debt servicing obligations. Although WIKA experienced a slight improvement in 2024 with Z-Score of 0.65, the company remained in a distressed condition. The overall trend from 2020 to 2024 demonstrates persistent financial instability, weakening solvency, and significant operational challenges. Based on results, the study recommends that WIKA prioritize strengthening liquidity through improved receivable collection, tighter working capital management, and selection of projects with faster cash conversion cycles. Additionally, comprehensive debt restructuring and divestment of non-core assets are essential to alleviate financial pressure. In the long term, WIKA must enhance profitability, enforce strict cost control, and improve project monitoring to prevent further delays and inefficiencies. These strategic initiatives are crucial to restoring financial stability and lowering the long-term bankruptcy risk identified by the Z-Score analysis.
Keywords: Altman Z-Score, State-Owned Enterprise, Financial Performance, Bankruptcy Risk.

INTRODUCTION

The financial health of the company is a fundamental indicator of its sustainability and ability to meet long-term obligations. It reflects the firm's capacity to manage liquidity, profitability, and solvency efficiently. According to Kristanti (2023), financial distress occurs when a company experiences difficulties in fulfilling its financial obligations, which often serves as an early signal of potential bankruptcy or restructuring. The early detection of financial distress is essential for management, investors, and policymakers to design preventive measures and ensure business continuity.

In Indonesia, state-owned enterprises (SOEs) play a vital role in supporting national infrastructure and economic development. SOEs act as agents of development, contributing to strategic sectors such as transportation, construction, and energy (Asian Development Bank, 2022). However, many SOEs in Indonesia, especially those in the construction sector, have encountered financial pressures arising from high leverage, project delays, and macroeconomic shocks. Wibowo (2024) highlights that Indonesian construction SOEs generally face higher debt burdens and greater financial risk compared to private firms, mainly due to their capital-intensive projects and dependency on government contracts.

Financial distress, often referred to as financial difficulty, is a preliminary warning signal preceding a company's bankruptcy. It manifests through persistent losses and the inability to meet financial obligations when due, primarily caused by insufficient cash flow (Yuningsih et al., 2025). So, it can be defined that financial distress is a condition where the company can not meet its financial obligations on time, often caused by declining profitability, excessive debt, and poor liquidity, considered the stage before bankruptcy. It can represent a critical phase in a company's financial status, characterized by perilous financial indicators; nonetheless, the organization retains the potential for recovery through managerial intervention, cost reduction, or reorganization.

Company bankruptcy is typically precipitated by external factors, including inflation, taxation policies, foreign currency depreciation, natural disasters, and the company's economic or geographical conditions, as currently observed in Indonesia due to the protracted economic crisis resulting in insolvency. In addition to external variables, internal factors may also contribute, including insufficient collaboration among management, inadequate expertise in the optimal utilization of assets and liabilities, among others (Ardiwinarta et al., 2023).

Company bankruptcy is the legal declaration if the company cannot pay its liabilities, marking the final phase of financial distress where the firm's assets are liquidated or its debts restructured to settle obligations. A company can be declared bankrupt by the Commercial Court (Pengadilan Niaga) if it has two or more creditors and fails to pay at least one debt that is due and collectible based on the Indonesian Law No. 37/2004 on Bankruptcy and Suspension of Debt Payment (PKPU). (UU Republik Indonesia No. 37/2004 Tentang Kepailitan Dan Penundaan Kewajiban Pembayaran Utang, 2004)

PT Wijaya Karya (Persero), Tbk (hereafter referred to as WIKA) is one of Indonesia's largest state-owned construction and engineering enterprises. Established in 1960 and listed on the Indonesia Stock Exchange (IDX) since 2007, WIKA has been actively involved in national strategic infrastructure projects, including toll roads, bridges, airports, and energy facilities. Despite its important role, the company's financial performance in recent years has shown signs of deterioration. During the 2020–2024 period, WIKA reported declining profitability, negative retained earnings, and increasing debt levels, reflecting potential symptoms of financial distress (Yuliandi and Ramadhan, 2025). The impact of the COVID-19 pandemic, along with rising construction material prices and delayed project payments, further worsened the company's liquidity and operational performance (Wibowo et al., 2024).

Therefore, this study aims to analyze the financial condition of PT Wijaya Karya (Persero), Tbk during the 2020 – 2024 period using the Altman Z - Score model. This approach provides a comprehensive evaluation of WIKA's financial performance through four key ratios, working capital devided to total assets, retained earnings devided to total assets, EBIT devided to total assets, and book value of equity devided to total liabilities. By applying this model, the research seeks to identify the company's financial stability level, detect potential distress risks, and provide valuable insights for management, government stakeholders, and investors in anticipating future financial challenges and improving decision-making processes.

LITERATURE REVIEW

A. THE CONCEPT OF FINANCIAL DISTRESS

Financial distress analysis is an excellent approach for assessing financial vulnerability. Edward I. Altman invented the Altman Z-score model in 1968, and it is one of the most extensively used models for predicting business financial difficulties to assess the likelihood of bankruptcy, the model incorporates several financial parameters, including working capital, retained earnings, earnings before interest and taxes (EBIT), and equity valuation, based on Altman's 1968 research. Altman developed his concept into the Altman Z-score, which is intended for non-manufacturing and emerging-market enterprises, such as those in Indonesia's infrastructure sector. (Altman, 2018).

The forecast of financial distress has long captivated the interest of numerous researchers. In his 1966 study Financial Ratios as Predictors of Failure, Beaver in Baisag and Patjoshi (2020) examined the efficacy of financial ratios in forecasting financial difficulty by analyzing a collection of 30 financial ratios. He analyzed a sample of 79 enterprises and their financial data from 1954 to 1964. The study discovered that not all ratios are equally effective in anticipating financial crisis circumstances. Financial ratios that have demonstrated more usefulness in predicting financial crises are cashflow to total debt, net income to total assets, and total debt to total assets.

The classification of financial health functions as the dependent variable and constitutes the ultimate result of the analysis. It is established through the Altman Z Score classification into secure zone, gray area, or risk zone, which indicates the company's actual financial condition and serves as the foundation for assessing its financial stability (Putri & Maielyana, 2025)

B. PT WIJAYA KARYA (PERSERO), TBK

PT Wijaya Karya (Persero), Tbk was established on March 11, 1960, following the nationalization of the Dutch company Naamloze Vennootschap Technische Handel Maatschappij en Bouwbedrijf Vis en Co. The company was then designated as a State-Owned Enterprise under the name PN Wijaya Karya, and in 1972 its status changed to Persero (Limited Company) in accordance with Government Regulation No. 64 of 1971. Over time, WIKA rapidly developed into one of the leading national contractors. In 2007, WIKA officially listed on the Indonesia Stock Exchange (IDX) under the stock code WIKA, becoming a public company (Tbk) (PT Wijaya Karya (Persero), 2024)

PT Wijaya Karya (Persero) Tbk has faced recent issues, namely a reduction in net profit and a rise in debt. These variables have influenced the company's financial parameters, such as the debt-to-equity ratio and net profit margin. Investors frequently employ these measures to evaluate a company's financial soundness and prospects for future development. Inferior financial ratios can diminish investor trust and affect the company's stock price. Therefore, organizations must assess their

operational management strategies and investigate methods to improve efficiency, thereby increasing profit margins. A comprehensive review of financial statements can empower management to make educated decisions to enhance financial performance and restore investor trust. This research introduces a compelling topic for comprehensive examination.

PT Wijaya Karya (Persero) Tbk, also known as WIKA, is a prominent and significant organization in Indonesia's construction sector. WIKA, with a distinguished legacy in infrastructure and property development, was recognized as The Most Outstanding Company in Indonesia's Construction Sector in 2020. The company's total assets in 2024 reached IDR 63.556 billion, solidifying its status as the largest contractor in the nation. WIKA has significantly contributed to numerous government projects, including toll highways and airports. Additionally, WIKA operates other specialist businesses that cover an extensive array of construction sectors. (PT Wijaya Karya (Persero), 2024)

C. THE ALTMAN Z – SCORE

One of the most extensively acknowledged frameworks for forecasting corporate insolvency is the Altman Z-Score Model, devised by Edward I. Altman in 1968. The model combines five financial ratios through multiple discriminant analysis to evaluate a company's probability of failure. Subsequent adjustments were implemented to enhance its applicability: the Altman Z-Score in 1983 for private firms and the Altman Z-Score in 1995 for non-manufacturing companies and enterprises in emergent markets. This approach is designed to assess a company's likelihood of bankruptcy, and can also be used as a measure of overall financial performance. Altman (2018) used the Multiple Discriminant Analysis method with five types of financial ratios: working capital/total assets (X1), retained earnings/total assets (X2), earnings before interest and taxes/total assets (X3), market value of equity/book value of debt (X4), and sales/total assets (X5) to determine the potential or likelihood of a company going bankrupt. From its Z-score, based on the cut-off point reported by Altman. A company can be classified into one of three categories: healthy, healthy but vulnerable to bankruptcy, or predicted to go bankrupt (Altman, 2018).

Baisag and Patjoshi (2020) highlighted that Altman’s model remains one of the most frequently used bankruptcy prediction tools worldwide and that key financial ratios such as leverage, cash flow, and profitability continue to be the main focus for avoiding distress (Baisag & Patjoshi, 2020).

To address the limitations inherent in ratio analysis, an analytical tool known as Z-score analysis can be utilized. This tool simultaneously integrates multiple ratios to forecast the potential insolvency of a company. Z-score analysis, pioneered by Edward Altman, serves as an instrumental method for evaluating the probability of corporate insolvency and serves as a gauge of comprehensive financial performance (Utami & Hardana, 2022). It is possible to assess and evaluate a company's bankruptcy risk through its financial statements by using a ratio analysis to those statements. Z-score analysis is a crucial instrument for assessing the company's financial standing and evaluating the outcomes in relation to the company's selected strategy.

After conducting research on various manufacturing companies and developing two bankruptcy prediction formulas, Altman revisited his research on companies outside the manufacturing sector, including both publicly traded and non-publicly traded companies. This third Z-Score formula is more flexible and can be applied for various types of company business sectors, whether they are already public or not. This formula is also suitable for use in developing countries like Indonesia (Maruli et al., 2024).

Rudianto (2013) defined that Altman's third study outcome produced a more adaptable formula applicable across many business sectors, including both public and private entities. The study's results produced the subsequent formula:

By 1983, the Z-Score model was revised to encompass publicly traded companies, non-manufacturing sectors, and expanding markets. In the nonmanufacturing and emerging markets model (the EM Z-score model, 1995; henceforth, the Z-score), the fifth variable (X5 = Sales/Total Assets) from the original Altman model was excluded due to its sensitivity to industry turnover. The Altman Z-Score methodology incorporates four principal financial variables: working capital to total assets (X1), retained profits to total assets (X2), earnings before interest and taxes to total assets (X3), book value of equity to total liabilities (X4). These ratios measure liquidity, profitability, solvency, and operational efficiency to assess potential financial distress. (Rudianto, 2013)

METHODOLOGY

This study paper's data sources include a variety of books, journals, and earlier studies that support the findings. The data sources used in the research analysis are from www.idx.co.id, the Indonesia Stock Exchange's official website. Furthermore, it conducted a literature review, which entailed gathering data by studying and comprehending books on financial distress and bankruptcy prediction analysis using the Z-Score approach, such as literature, journals, and research findings gathered from various sources. The data for this research came from the company's historical records, literature studies, research reports, and audited financial statements published by the PT Wijaya Karya (Persero), Tbk official website, as well as from the internet, covering the five-year period from 2020 to 2024. WIKA was chosen due of its affiliation with the largest construction firm in Indonesia.

This research used the Altman Z-Score approach for publicly listed corporations in its data analysis, utilizing the following formula:

$$Z = 6.56\ X1 + 3.26\ X2 + 6.72\ X3 + 1.05\ X4$$

Source: (Altman, 1995)

Remarks:
X1 = Working Capital / Total Assets
X2 = Retained Earnings / Total Assets
X3 = EBIT / Total Assets (X3)
X4 = Book Value of Equity / Total Liabilities

Z-Score are the financial distress parameter index, because the Altman Z-Score functions as an indicator used to measure how close a company is to financial distress or bankruptcy.

The higher the X1, X2, X3, and X4 numbers, the lower the company's potential in financial difficulties. The lower the values of X1, X2, X3, and X4, the greater the likelihood of the company's crisis (Prasetyanto & Probohudono, 2021) (Prasetyanto & Probohudono, 2021). Here is the evaluation standards for the modified Altman Z-Score can be seen in Table 1 below:

Table 1. The condition of a company's bankruptcy Z- Score Value

No.	Indicator	Criteria	Interprestasi
1	Z<1,1	Distress Zone	The company is experiencing financial difficulties and high risk.
2	Z 1,1 – 2,6	Gray Zone	The company is experiencing financial problems that need to be addressed appropriately
3	Z > 2,6	Safe Zone	For a company in good financial health, the likelihood of bankruptcy is very small.

Source : (Rudianto, 2013)

Table 1 shows If Z-score of less than 1.1 implies that the firm is in significant financial difficulties (financial distress). The company in this area typically exhibit very low profitability, substantial leverage or inability to pay debt commitments, and limited liquidity. The organization is also experiencing difficulties in asset usage. It also indicates that the company has a significant risk of insolvency. Immediate remedial action or reorganization is often required.

If the Z-score of $1.1 < Z < 2.6$ indicates a grey zone area . It places a corporation in an unclear or transitory financial situation because the company is neither obviously healthy nor plainly distressed; financial performance may be erratic, and minor financial adjustments might shift the organization into safer or riskier categories. In this zone, the company must be carefully monitored. It may survive if conditions improve, but it may experience suffering if hazards are not handled.

If Z-score greater than 2.6 indicates that the company is financially healthy. The corporation is deemed financially stable. Typically, this indicates that the firm has consistent profitability, robust liquidity, high asset turnover, and balanced leverage. Based on past data, companies in this category are unlikely to fail.

Reffefing to the Formula of Z-score above, X1 evaluates liquidity by comparing the company's net liquid assets to its total capitalization. It displays the company's short-term financial strength, demonstrating its capacity to withstand financial shocks and continue operations. Working capital is regarded an early warning variable, because troubled companies frequently show degradation in current assets and rises in current liabilities long before bankruptcy. (Altman, 1995).

Formula:

$$X1 = \frac{\text{Working Capital}}{\text{Total Asset}} = \frac{\text{Current Asset - Current Liability}}{\text{Total Assets}}$$

Source: (Altman,1995)

Altman (1995) defined X2 as the cumulative profitability of a corporation over time. It represents the percentage of the company's assets financed by internally produced cash, the company's stability, long-term earning potential, and reinvestment capacity.

Formula:

$$X2 = \frac{\text{Retained Earnings}}{\text{Total Assets}} = \frac{\text{Retained Earnings}}{\text{Total Assets}}$$

Sorce: (Altman, 1995)

X3 assesses operating profitability regardless of financing structure or tax environment. This gives it a pure measure of operational efficiency. Altman (1995) defined X3 as the most strong predictor of bankruptcy among all factors, owing to distressed enterprises' diminishing operating profits, eroding margins, and negative EBIT in later stages.

Formula:

$$X3 = \frac{EBIT}{\text{Total Assets (OIROI)}}$$

Source : (Altman, 1995)

X4 measures the company's leverage and solvency position. It shows how much buffer the firm has to cover its debt obligations where book equity is used because private/emerging-market firms may not be publicly traded. X4 reflects long-term financial structure and risk, a stronger equity base means more ability to absorb losses. (Altman, 1995)

Formula:

$$X4 = \frac{\text{Book Value of Equity}}{\text{Total Liabilities}} = \frac{\text{Total Assets} - \text{Total Liabilities}}{\text{Total Liabilities}}$$

Source : (Altman, 1995)

FINDINGS AND RESULT

Based on the data processing findings, the research reveals that from 2020 to 2024, PT Wijaya Karya (Persero) Tbk constantly maintained a high-risk financial position. The Altman Z-Score values for the five-year period show that the company was consistently in the distress zone, indicating greater susceptibility to financial instability and probable insolvency. This position shows that WIKA experienced significant liquidity, profitability, and solvency issues, all of which affected its financial resilience. Although the company is at high-risk of bankruptcy, how efficiently and quickly management reacts to these financial difficulties will have a significant impact on the result. Appropriate and timely actions may enable the company to recover, but delays or inefficient choices may hasten financial decline and even lead to corporate collapse.

Table 2 shows the findings of the X-component ratios and the financial distress assessment generated from the Altman Z-Score model, indicating what happened to WIKA's financial situation each year. The results are based on WIKA's yearly reports from 2020 to 2024 and include thorough explanations of each X-value. These interpretations illustrate how deficiencies in liquidity, cumulative profitability, operational performance, and solvency led to the company's ongoing financial difficulty during the time under consideration.

Table 2. The X component value from 2020 – 2024

FORMULA	X1	X2	X3	X4
	Working Capital / Total Assets	Retained Earnings / Total Assets	EBIT / Total Assets	Book Value of Equity / Total Liabilities
2020	3,768,415,789 / 68,109,185,213 **0.06**	12,815,947 / 68,109,185,213 **0.00**	310,275,688 / 68,109,185,213 **0.00**	16,657,425,071 / 51,451,760,142 **0.32**
2021	217,064,209 / 69,385,794,346 **0.00**	79,761,505 / 69,385,794,346 **0.00**	196,664,427 / 69,385,794,346 **0.00**	17,435,077,712 / 51,950,716,634 **0.34**
2022	3,699,463,282 / 75,069,604,222 **0.05**	(4,856,202) / 75,069,604,222 **(0.00)**	176,080,896 / 75,069,604,222 **0.00**	17,493,206,188 / 57,576,398,034 **0.30**
2023	(7,635,637,613) / 65,981,235,888 **(0.12)**	(7,200,895,956) / 65,981,235,888 **(0.11)**	(7,765,545,396) / 65,981,235,888 **(0.12)**	9,571,613,042 / 56,409,622,846 **0.17**
2024	11,215,218,797 / 63,556,342,748 **0.18**	(9,539,141,220) / 63,556,342,748 **(0.15)**	(2,461,392,359) / 63,556,342,748 **(0.04)**	11,871,419,792 / 51,684,922,956 **0.23**

Source: Author Analysis, 2025

In 2020, during the COVID-19 pandemic, WIKA experienced a significant decline in financial performance as the construction and infrastructure sectors were heavily disrupted. The pandemic caused restrictions on mobility, project delays, supply chain interruptions, and slower payments from clients, especially government-related infrastructure projects. These factors collectively weakened WIKA's operational and financial results throughout the year.

X1 from 2020 to 2022 fluctuated between 0.00 and 0.06, indicating very constrained short-term liquidity. In 2023, it is negative (0.12), signifying that current obligations exceed current assets, which is indicative of a liquidity crisis. The value of X1 in 2024 improved to 0.18, which is an improvement, but it is still not enough for a successful business. The X2 component indicates that WIKA's long-term profitability foundation has substantially diminished by 2023 – 2024. WIKA's retained earning have become negative since 2023, as seen by the table indicating that negative X2 signifies accumulated losses exceeding accumulated profits, which serves as a significant long-term distress indication. Negative X3 in 2023 and 2024 due to operational losses, with no profitability, the period from 2020 to 2022 reflects minor or no operating returns at 0.00. X4 is positive, indicating a favorable indication, although it has a falling tendency post-2021. It suggests that WIKA retains a degree of equity buffer; but solvency is deteriorating over time, with the 2023 – 2024 figures (0.17 – 0.23) indicating elevated leverage and debt strain. The result of Altman Z-Score Analysis of PT Wijaya Karya (Persero), Tbk. for Period of 2020 – 2024 can be seen in the table 3 below:

Table 3. The result of Altman Z-score from 2020 – 2024

Category	C	X1	C	X2	C	X3	C	X4	Result	Findings	Remarks
2020	6.56	0.06	3.26	0.00	6.72	0.00	1.05	0.32	0.73	0.73 < 1.1	Distress Zone
2021	6.56	0.00	3.26	0.00	6.72	0.00	1.05	0.34	0.40	0.40 < 1.1	Distress Zone
2022	6.56	0.05	3.26	(0.00)	6.72	0.00	1.05	0.30	0.66	0.66 < 1.1	Distress Zone
2023	6.56	(0.12)	3.26	(0.11)	6.72	(0.12)	1.05	0.17	(1.73)	(1.73) < 1.1	Severe Distress Zone
2024	6.56	0.18	3.26	(0.15)	6.72	(0.04)	1.05	0.23	0.65	0.65 < 1.1	Distress Zone

Source: Author Analysis, 2025

Based on the Altman Z-Score results presented for the period 2020–2024, PT Wijaya Karya (Persero) Tbk consistently fell within the distress zone, indicating a financial vulnerability. Throughout 2020 to 2024, WIKA's Z-Score remained below the threshold of 1.1, which signals a high probability of financial distress. These values suggest persistent weaknesses in key financial components such as liquidity, profitability, and retained earnings. The company's inability to generate strong operational returns and maintain healthy working capital positions contributed to its continued presence in the distress category. Although there were slight improvements in certain years, the overall pattern demonstrates that WIKA struggled to achieve financial stability across the five-year span.

In 2020, the Z-Score of 0.73 placed the company firmly in the Distress Zone (below the critical 1.10 threshold), signaling a high probability of financial distress or potential bankruptcy. This low score suggests that any number of the basic financial components, likely working capital, retained earnings, or profitability were already deteriorating, indicating significant pre-existing instability in the company's financial structure even before subsequent market pressures. the COVID-19 pandemic is highly likely to have significantly impacted the Altman Z-Score result for WIKA in 2020 (0.73) and contributed to the further decline in 2021 (0.40). The construction sector was directly and severely affected by the pandemic.

The financial situation significantly worsened in 2021 as the Z-Score declined further to 0.40, moving deeper into the high-risk Distress Zone. This sharp drop implies that the company experienced a rapid deterioration in key performance indicators, likely due to compounding losses (driving down retained earnings) or increased liabilities relative to equity (the financial ratios underpinning the Z-Score components X1 to X4), thus escalating the predicted risk of financial failure compared to the previous year.

While 2022 saw a slight technical recovery from the 2021 low, with the score settling at 0.66, the company remained critically exposed within the Distress Zone. This outcome indicates that while the rate of financial deterioration may have slowed or some ratios slightly improved, the fundamental issues of high leverage and/or sustained unprofitability necessary to cross back into the Gray Zone (above 1.10) were not resolved, suggesting that the underlying instability persisted.

The year 2023 stands out as the most critical, with a Z-Score of (1.73), placing the company firmly in the severe distress zone. This sharp decline reflects significant financial deterioration, likely driven by operational losses, weakened solvency, and negative retained earnings. The severe distress score indicates an elevated risk of bankruptcy if corrective measures are not taken promptly and effectively.

For 2024, the Z-Score rebounded substantially to 0.65 from the catastrophic 2023 figure, suggesting successful immediate stabilization efforts and an improvement in key financial ratios, particularly compared to the prior year's low point. However, despite this positive trajectory and sharp recovery, the score remains below the 1.10 benchmark, meaning PT Wijaya Karya (Persero) Tbk is still firmly classified in the Distress Zone and continues to face a significant, ongoing threat to its long-term solvency. Overall, the results emphasize the need for decisive management action to address structural financial issues and prevent further

deterioration. The summary of the result of Z-score to the financial goal and improvement effect can be seen the table 4 below:

Table 4. Z-Score Improvement Strategy (X1 – X4 component)

Altman Z-Score Component	Financial Goal	Z-Score Improvement Effect
X1 (WC/TA)	Improve cash flow through tighter collection and inventory control.	Minor Impact (but critical for short-term survival).
X2 (RE/TA)	End current financial year with a net profit to rebuild retained earnings.	Major Impact. Lifts the long-term cumulative health of the company.
X3 (EBIT/TA)	Achieve consistent, positive EBIT.	Highest Impact. Directly moves the score up due to its large coefficient (6.72).
X4 (MVE/TL)	Execute debt restructuring and asset recycling; stabilize/increase share price.	Major Impact. Reduces financial risk perception by creditors and the market.

Source: Author Analysis, 2025

From the finding and analysis above, WIKA's consistently low Altman Z-Scores, especially the negative score in 2023, indicate a critical need for fundamental restructuring focused on improving profitability and drastically reducing financial risk. The strategy must directly target the four main ratios (X1 to X4) that make up the Z-Score.

CONCLUSION AND RECOMMENDATION

Based on the Altman Z-Score results from 2020 to 2024, WIKA consistently remained in the Distress Zone, indicating a persistently high probability of financial difficulty and an elevated risk of bankruptcy. Throughout 2020–2022 and again in 2024, WIKA recorded Z-Scores between 0.40 and 0.73, far below the healthy threshold of 2.6, which is the benchmark for financially stable companies. These low scores reflect several structural financial issues such as weak liquidity, declining profitability, and a heavy leverage burden that continues to pressure the company’s solvency. The situation became even more alarming in 2023, where WIKA posted a Z-Score of (1.73), placing it in the Severe Distress Zone. This negative score strongly signals substantial financial strain, likely driven by significant losses, major project delays, high interest expenses from long-term debt, and the pressures that accompany ongoing restructuring efforts. Although there is slight improvement noted in 2024 with a Z-Score of 0.65, this number remains within the distress category, indicating that WIKA is still far from recovery. Overall, the five-year trend demonstrates continuous financial instability, weakening solvency, and persistent operational challenges, highlighting that WIKA remains at considerable financial risk unless major corrective actions are taken.

Based on the financial distress and recent restructuring efforts, here are suggestions and recommendations for WIKA to improve profitability and escape the financial distress zone. First, WIKA needs to improve Liquidity (X1) by ensuring has enough short-term cash flow to cover its short-term obligations without defaulting. Disciplined working capital Management can strictly control inventory and Accounts Payable (AP) while aggressively pushing Accounts Receivable (AR) collection. A quick win is reducing the Days Sales Outstanding (DSO) to turn revenue into cash faster. Focus on Cash-Generating Projects to prioritize projects with favorable cash-inflow terms, demanding a higher upfront payment and milestone payments that align better with the timing of construction costs.

Capital injection subject to market conditions, a strategic equity offering or a government capital injection (PMN) could be used to enhance the equity base, immediately improving the Solvency ratio and potentially raising the (X2) components of the Z-Score.

The major goal must be to generate consistent operational profits to increase Profitability (X3), as seen by the variable's high coefficient in the Z-Score calculation. Focus on high-margin, low-risk opportunities. Projects by significantly shifting the project portfolio away from large, long-term infrastructure projects with low margins or severe political/execution risks. Implement strict cost management across all project phases to achieve operational excellence and cost control. This involves centralizing procurement (Supply Chain Management) to reduce material costs, optimizing material and labor usage, and reducing administrative overhead (as WIKA has already begun). Also, speed billing and collection in the construction industry, which is prone to significant accounts receivable. WIKA must use its clout as an SOE to enforce tighter contract terms, hasten certification of job completion, and ensure faster collection of receivables to avoid profit being trapped up as non-earning assets.

Improving solvency and leverage (X4), given that the company has undergone a significant restructuring (MRA), the next stages must focus on reducing debt and increasing equity. Effective debt restructuring can reduce interest rates or convert debt to equity. The purpose is to reduce the denominator (Total Liabilities) or alleviate its burden. Non-core asset disposal (Asset Recycling) can aggressively sell non-strategic assets, particularly non-core land, properties (Realty & Property assets not related to core company), or minority holdings in underperforming subsidiaries. The revenues must be used solely to repay high-interest debt or cover working capital gaps, thereby decreasing obligations.

Moreover, as a state-owned enterprise, WIKA should actively seek government support in the form of financial assistance or policy interventions to facilitate smoother restructuring. Finally, WIKA must reassess its strategic direction by concentrating on core competencies, avoiding high-risk expansions, and improving transparency to restore credibility with investors and stakeholders. Collectively, these efforts can gradually improve WIKA's financial stability and reduce the long-term bankruptcy risk implied by its Altman Z-Score trend.

REFERENCES

Altman, E. I. (2018). Applications of distress prediction models: What have we learned after 50 years from the Z-Score models? *International Journal of Financial Studies*, *6*(3), 1–15. https://doi.org/10.3390/ijfs6030070

Ardiwinarta, I., Dewi, N. A., & Sunardi, N. (2023). Analisis Prediksi Kebangkrutan Dengan Menggunakan Metode Altman Z-Score Pada PT. Wijaya Karya (Persero) Tbk. *Jurnal Nuansa : Publikasi Ilmu Manajemen Dan Ekonomi Syariah*, *1*(4), 378–387. https://doi.org/10.61132/nuansa.v1i4.578

Asian Development Bank. (2022). *Unlocking the Economic and Social Value of Indonesia's State-Owned Enterprises* (Issue December). https://doi.org/10.22617/SPR220442-2

Baisag, S., & Patjoshi, P. (2020). Corporate Financial Distress Prediction – A Review Paper. *PalArch's Journal of Archaeology of Egypt/Egyptology*, *17*(9), 2109–2118.

Kristanti, F. T., Safriza, Z., & Salim, D. F. (2023). Are Indonesian construction companies financially distressed? A prediction using artificial neural networks. *Investment Management and Financial Innovations*, *20*(2), 41–52. https://doi.org/10.21511/imfi.20(2).2023.04

Maruli, T. S., Siregar, G. S., & Simatupang, E. M. (2024). PENERAPAN ALTMAN Z-SCORE MODIFIKASI DALAM MEMPREDIKSI KEBANGKRUTAN PT PELABUHAN INDONESIA (Persero). *Prosiding Konferensi Nasional Social & Engineering Polmed (KONSEP)*, *5*(1), 291–299.

Prasetyanto, D., & Probohudono, A. N. (2021). Analysis of Financial Distress in Retail. *International Journal …*, *2021*(3), 1238–1246. https://jurnal.stie-aas.ac.id/index.php/IJEBAR/article/view/3448%0Ahttps://jurnal.stie-aas.ac.id/index.php/IJEBAR/article/download/3448/1552

PT Wijaya Karya (Persero), T. (2024). *SUSTAINABILITY Company Profile PT Wijaya Karya (Persero) Tbk*. chrome-extension://efaidnbmnnnibpcajpcglclefindmkaj/https://cms.wika.co.id/storage/3987/COMPANY-PROFILE-WIKA-2024-(COMPRESSED).pdf

Putri, A. A. E., & Maielyana, R. (2025). Financial Ratio Analysis and Health Level of PT Wijaya Karya (Persero) Tbk Based on Altman Z-Score. *Jurnal Akuntansi, Ekonomi Dan Manajemen Bisnis*, *13*(1), 178–186. https://doi.org/10.30871/jaemb.v13i1.8560

Rudianto. (2013). *Akuntansi Manajemen: Informasi untuk Pengambilan Keputusan Strategis* (1st ed.). Erlangga.

Utami, T. W., & Hardana, A. (2022). Analisis Prediksi Kebangkrutan dengan Menggunakan Metode Altman Z-Score pada PT. Indofood Sukses Makmur, Tbk. *SOSMANIORA: Jurnal Ilmu Sosial Dan Humaniora*, *1*(4), 399–404. https://doi.org/10.55123/sosmaniora.v1i4.1116

UU Republik Indonesia No. 37/2004 Tentang Kepailitan Dan Penundaan Kewajiban Pembayaran Utang, 1 (2004). https://peraturan.bpk.go.id/Home/Details/40784

Wibowo, F. A., Satria, A., Gaol, S. L., & Indrawan, D. (2024). Financial Risk, Debt, and Efficiency in Indonesia's Construction Industry: A Comparative Study of SOEs and Private Companies. *Journal of Risk and Financial Management*, *17*(7), 1–16. https://doi.org/10.3390/jrfm17070303

Yuliandi, Y., & Ramadhan, M. F. (2025). Financial Distress Prediction of Indonesian State-Owned Construction Firms Across the COVID-19 Period Using the Altman Z-Score Method. *Jurnal Ilmiah Akuntansi Kesatuan*, *13*(3), 477–484. https://doi.org/10.37641/jiakes.v13i3.3807

Yuningsih, F., Suherman, U. D., & Suhendi. (2025). Altman Z-Score Analysis of Financial Distress in Issi-Listed Cosmetics and Household Manufacturing Sector. *Finansha: Journal of Sharia Financial Management*, *6*(1), 19–34. https://doi.org/10.15575/fjsfm.v6i1.39335

CHAPTER 5
The "Portfolio Drag" Paradox: When Volume-Led Growth Becomes Value-Destructive in a Transitioning Energy Market – A Case Study of PT Perusahaan Gas Negara

Risnu ZUHRUFFANI
Institute IPMI, Indonesia
Risnu.zuhruffani@ipmi.ac.id
Orcid: 0009-0005-8371-3042

Wiwiek Mardawiyah DARYANTO
Institute IPMI, Indonesia
Wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

Najwa ALIMAH
Institute IPMI, Indonesia
najwa.alimah@ipmi.ac.id
Orcid:0009-0004-6980-3976

ABSTRACT

This study investigates the financial paradox confronting PT Perusahaan Gas Negara (PGAS), a stated-owned energy entity whose significant growth in gas sales volume over a recent five-year period has not translated into commensurate profit growth. Instead, the company exhibits contracting EBITDA margins, indicating a decline in operational efficiency and profitability per unit of sales. The study hypothesizes that this gap between volume growth and profit stagnation is driven by a deterioration in PGAS's product portfolio mix. Specifically, it posits that revenue growth has been disproportionately fueled by low-margin segment, namely gas trading and regulated transmission while the contribution from higher margin distribution and retail sales has lagged. The research employs a financial analysis of PGAS's segmental reporting from 2020 to 2025. The methodology involves a segment wise margin analysis to track EBITDA margins for Gas trading, transmission & distribution and upstream complemented by a portfolio mix analysis to quantify each segment's changing contribution to total revenue and profit. While looking out as well cash return on capital investment to give a clearer picture of cash profitability and specifically unit economics ration where capacity utilization drives revenue. The findings confirm the "portfolio drag" effect, revealing that the shifting revenue mix toward lower-margin activities has indeed eroded overall profitability which estimated 5.8-5.9 pp consolidated margin erosin. Based on this diagnosis, the study concludes with strategic recommendations by running a sensitivity analysis to evaluate potential solutions, exploring the efficacy of revising commercial agreements and pursuing aggressive market penetration in high-margin segments against the alternative of strategic cost optimization in facility maintenance to restore sustainable profitability specifically for decision making processes to build new transmission to the upstream business and push ROIC up to 9.8% WACC.
Keywords: Transitioning Energy Market, EBITDA, sensitivity analysis.

INTRODUCTION

Globally the energy transition is a complex rebalancing act not a fuel substituting requiring the scaling of new technology alongside continued investment in hydrocarbons to meet growing demand for reliable and affordable. Global energy demand is projected to increase approximately 15% through 2050, driven by economic growth in developing nations. In this landscape, natural gas is positioned to be the fastest growing major energy source, gaining share due to its critical role in providing dispatchable power for grids and lower-emission energy for industrial growth. This will require expanding renewables and maintaining investment in natural gas infrastructure. (ExxonMobil, 2024)

For Indonesia this global context creates a decisive strategic mandate for PGAS as the government's target to increase gas's share to 24% by 2050 entirely on overcoming the nation's fundamental infrastructure bottleneck. Integrated network is the essential platform for Indonesia's energy sovereignty, connecting domestic supply with demand. (Ministry of Energy and Mineral Resources, Republic of Indonesia , 2021)

PGAS or known as PT Perusahaan Gas Negara, is the public leading company for natural gas distribution, transmission and transportation. This company plays vital roles for the country as part of gas infrastructure, improving energy access for various segment customers. Which also enables us to have cleaner and efficient energy sources compared to other fossil fuels. Company Operations are extensive, encompassing 96% Indonesia's national natural gas pipeline network. (Perusahaan Gas Negara, 2025)

THEORITICAL FRAMEWORK

Perusahaan Gas Negara has been established in the commodity energy business which known that which is known for its volatility not only in market dynamics but also in operational risks that continually change depending on natural gas demand. The corporation through his G-A-S corporate strategic that are meaning (Perusahaan Gas Negara, 2024):

- **G**row, sustain base business by carrying out initiatives to capture value. By continuing broaden the gas infrastructure for transmission, distribution and regassification, develop infrastructure for the household gas network, increase E&P Upstream working field's valuation, Support development of crude oil infrastructure.
- **A**dapt, tackle the challenges while capturing opportunities within existing base business. By developing LNG infrastructure and trading, Developing domestic upstream LNG, total solution energy services provider.
- **S**tep-out, ambidextrously developing business that focuses on reducing carbon emission by using more sustainable energy in supporting national's net zero emission target by 2060 in performing exploration on the gas to chemicals, hydrogen, biomethane, ammonia and CO2 transport.

The company is strengthening its position across the entire energy value chain, starting with enhancing customer attachment for industrial and commercial clients (98% from total revenue) in Java and Sumatra through pipeline expansion and the rollout of retail CNG and LNG services beyond the pipeline network. Key ongoing pipeline project e.g. Tegal-Cilacap gas pipeline and industrial connectivity in Kendal will unlock new industrial markets.

The phenomenon of "portfolio drags" it emerges at intersection few complementary strategic and financial framework. Together, they provide multi-faceted explanation for why growth can be valued as destructive. (Ezekoye, 2025)

Barney's Resource-Based View (RBV)

Barney's framework emphasizes that a firm's resources must be valuable, rare, inimitable, and non-substitutable to achieve sustained competitive advantage. (Barney, 1991)

- Valuable Resources - Resources that enable a firm to implement strategies that improve efficiency and effectiveness.
- Rare Resources: Resources that are not widely possessed by competitors. If a resource is common, it cannot provide a competitive advantage.
- Inimitable Resources: Resources that cannot be easily replicated by competitors. This could include unique historical conditions, causal ambiguity, or social complexity.
- Organized Resources & capability: Resources that cannot be replaced by other resources. If competitors can find alternative ways to achieve the same benefits, the resource does not provide a sustained advantage.

For PGAS, its primary VRIO resources are its nationwide pipeline infrastructure, government granted licenses and technical expertise in gas logistics. This portfolio drag represents a fundamental misapplication of these core resources. The synthesis shows that PGAS is deploying its valuable infrastructure and market position into highly competitive, low-margin gas trading activities rather than focusing these resources on monetizing and expanding its monopolistic or oligopolistic distribution assets.

Corporate Portfolio Theory (BCG Matrix)

Theory exemplified by the Boston Consulting Group Growth-share matrix that provides a lens for managing multi business corporations as portfolio of cash flows like shown in the figure 1. Business is categorized as: (Hedley, 1977)

- Cash cows (high market share, low growth): Generate cash used to fund other segments
- Stars (high market share, high growth): Require investment to maintain position
- Question marks (low market share, high growth): Require cash to become starts, else should be divested
- Dogs (low market share, low growth): Generate little value, candidate for divestment

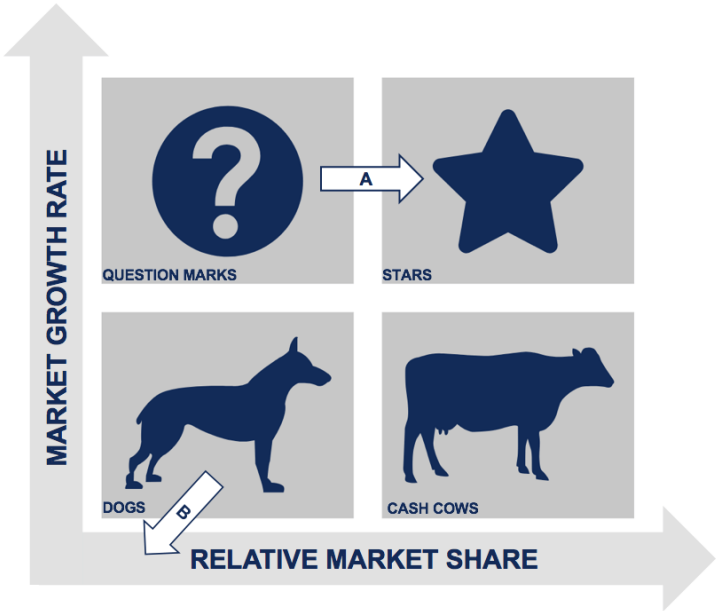


Figure 1Matrix Market Growth Rate vs Share

The synthesis indicates that PGAS's portfolio is becoming increasingly unbalanced. High-margin gas transportation and retail segments—its cash cows and stars—are being starved of strategic attention and capital. Conversely, the capital-intensive, low-margin gas trading segment acts as a dog, while new transmission projects risk becoming question marks if their returns are inadequate.

Economic Profit Model – Quantifying Value Destruction

Economic profit model or in operationalized as EVA provides the ultimate financial verdict (Stewart, 1991). That's providing framework for measuring corporate performance and creating shareholder value, so the firm only creates shareholder value if its return on invested capital (ROIC) exceeds it weighted average cost of capital.

$$Economic\ Profit = (ROIC - WACC) * Invested\ Capital$$

The synthesis are quantifiable value destruction because the misallocation of resources (RBV) into an unhealthy business mix that mechanically drives down the company's ROIC. When this ROIC falls below the company's WACC, every additional unit of capital invested in the portfolio destroys economic profit, event if it increases reported accounting earnings.

$$\boldsymbol{ROIC = \frac{NOPAT}{Average\ Invested\ Capital}}$$

NOPAT (net operating profit after tax) is measure of a company's operating profit after taxes, excluding the effects of financing and non-operating activities

$$NOPAT = Operating\ Profit * (1 - Tax\ Rate)$$

$$Invested\ Capital = Total\ Assets - (trade\ Payables + Other\ payables + advanced + accrued\ liabilities)$$

Estimating WACC for Indonesia stated owned entity requires assumptions. A common approach uses the capital asset pricing model for the cost equity

$$WACC = \left(^{E}/_{V} * R_e\right) + \left(^{D}/_{V} * R_d * (1 - Tax\ Rate)\right.$$

METHODOLOGY

To empirically investigate this synthesized theory, this paper employs an integrated four stage diagnostic framework. This structured approach ensures rigorous study and provides a clear, replicable methodology for diagnosing similar phenomena in other firms.

Resource & Business Segmentation

This to deconstruct the consolidated entity into its strategic component, aligning with its core resources and market activities. Analysis of segmental reporting to identify discrete business units (Transmission, Transportation, Gas Trading and Upstream) which provides map each segment to the core RBV resources.
Using PGAS audited financial statement and annual reports that analysis focuses on the VRIO characteristics (Valuable, Rare, Inimitable and Organized) of each resource

Business Segment	Core RBV	VRIO	Strategic Implication
Gas Transmission ***(****High Pressure Pipeline Network****)***	• National scale pipeline infrastructure • Right of way permits/licenses • SCADA pipeline monitoring • Technical Capability High Pressure Operation	V : High R : High (Natural monopoly) I : High O : Medium	Competitive Moat: Protected by significant regulatory and capital barriers.
Gas Distribution & Retail Transportation (City Gas Network	• Local distribution pipelines • Brand and customer relationship • Metering infrastructure	V : High R: High (Regulated monopoly) I : High O : M	Value Creator: Direct access to end customers with pricing power. High potential for margin expansion
Gas Trading (Commodity Trading & Wholesale)	• Trading licenses • Working capital • Supplier/customer contracts • Market intelligence capabilities	V : Medium R : Low I : Low O: Medium	Commodity Business: Highly, competitive, low barriers to entry. Minimal sustainable advantage
Gas Processing (Regassification & processing)	• Processing plant assets • Technical processing capability • Longe-term processing agreements	V: Medium R : Medium I : Medium O : High	Tolling Business: Asset dependent with moderate barriers, which return
LNG Infrastructure	• LNG infrastructure asset • Regulatory approvals for LNG	V : High (strategic energy transition) R : High I : High O: Medium	Business Growth: Critical for gas democratization. High capital intensity but strategic positioning
Upstream	• Hydrocarbon reserves • Exploration working interest • Subsurface capabilities	V : High (strategic energy transition) R : Finite I : High O: Critical	Foundation: Provides resources to secure supply and cost control for the whole value chain

Table 5 Resources Segmentation

Portfolio Profitability & Mix Analysis

To perform diagnosis the health and evolution of PGAS business portfolio by analyzing segment level profitability and revenue mix shift over 5 years period (2020-2025), find out the cause of the portfolio drag on the consolidated profitability. This following analysis is using financial statement 2020 until 3Q 2025.

Margin Analysis

Business Segment	2025 Revenue ($M)	2025 EBITDA($M)	2025 EBITDA Margin	2020 Revenue ($M)	2020 EBITDA ($M)	2020 EBITDA Margin	Margin Change(pp)	RBV Classification
Downstream- Gas Trading	2165.9	501	23%	2299.8	663	29%	(6)	Dog
Midstream -Transmission & Distribution	552.6	341	72%	382.1	254	87%	(16)	Cash cow
Upstream (E&P)	204.4	234	115%	203.7	334	131%	(15)	Star
Total PGAS	2922.9	1076.0	37%	2885.5	1251.0	43%	(7)	

Table 6 EBITDA Segmentation 2020 vs 2025

Business Segment	2025 Revenue ($M)	2025 EBITDA($M)	2025 EBITDA Margin	2023 Revenue ($M)	2023 EBITDA ($M)	2023 EBITDA Margin	Margin Change(pp)	RBV Classification
Downstream- Gas Trading	2165.9	501	23%	2573.1	690.2	27%	4	Dog
Midstream -Transmission & Distribution	552.6	341	72%	641.6	399.9	62%	(10)	Cash cow
Upstream (E&P)	204.4	234	115%	431.6	557.9	129%	14	Star
Total PGAS	2922.9	1076.0	37%	3646.3	1648.0	45%	(8)	

Table 7 EBITDA Segmentation 2023 vs 2025

Key findings from the EBIT segmentation above are, where the high margin foundation and Low margin growth:

- Upstream segment is confirmed as the highest margin business, while gas trading remains the lowest margin segment
- The core infrastructure segment (transmission, distribution) and Upstream business line experienced significant margin erosion, compounding the portfolio's problem

Portfolio Mix Shift Analysis

Business Segment	2020 Revenue Mix	2025 Revenue Mix	Change (pp)	2020 EBITDA Mix ($M)	2025 EBITDA Mix ($M)	Margin Change(pp)
Downstream- Gas Trading	79.7%	74.1%	(5.6)	47.2%	46.5%	(0.7)
Midstream - Transmission & Distribution	13.2%	18.9%	5.7	21.1%	31.7%	10.6
Upstream (E&P)	7.1%	7.0%	(0.1)	31.7%	21.8%	(9.9)
Total PGAS	100.0%	100.0%		100.0%	100.0%	

Table 8 Revenue Contribution 2025 vs 2020

Business Segment	2023 Revenue Mix	2025 Revenue Mix	Change (pp)	2023 EBITDA Mix ($M)	2025 EBITDA Mix ($M)	Margin Change(pp)
Downstream- Gas Trading	70.6%	74.1%	3.5	47.2%	41.9%	(5.3)
Midstream - Transmission & Distribution	17.6%	18.9%	1.3	21.1%	24.3%	3.2
Upstream (E&P)	11.8%	7.0%	(4.8)	31.7%	33.9%	2.2
Total PGAS	100.0%	100.0%		100.0%	100.0%	

Table 9 Revenue Contribution 2025 vs 2023

Key Finding for strategic shift from both comparison 2020 and 2023 case:

- The most dramatic change on the transmission & distribution revenue share
- This growth came primarily from the midstream business – transmission & distribution segment, which revenue increase (5.7pp), but able contributed 10.6pp
- Despite its shrinking revenue share, upstream EBITDA has significantly dropped to overall PGAS profitability its value destructive nature. But it looks like considering upstream is natural depletion from the reservoir and depends on production profile prediction.

Quantified Consolidated Margin Decomposition

Mix Shift Effect: $\sum \Delta Revenue\ Mix * (Margin\ segment - Margin\ Consolidated)$

Margin Change Effect: $\sum 2025\ Revenue\ Mix * (\Delta\ Margin)$

Driver of Margin Change A. Mix-shift Effect	**Calculation 2020 vs 2023 Case**	**Impact Consolidated Margin (pp)**
Gas Trading	(74.1%-79.1%) x (23%-37%)	0.8
	(74.1%-70.6%) x (23%-37%)	(0.5)
Transport and Distribution	(18.9%-13.2) x (72%-37%)	2.0
	(18.9%-17.6%) x (72%-37%)	(0.5)
Upstream	(7%-7.1%) x (115%-37%)	(0.1)
	(7%-11.8%) x (115%-37%)	(3.8)
Total Mix Shift Effect (2020 and 2023)		(3.8) - 2.7

Driver of Margin Change B. Margin Change Effect	**Calculation**	**Impact Consolidated Margin (pp)**
Gas Trading	(74.1%) x (23%-29%)	(4.4)
	(74.1%) x (27%-29%)	(2.8)
Transport and Distribution	(18.9%) x (72%-87%)	(2.8)

	(18.9%) x (72%-62)	1.8
Upstream	(7.0%)x(115%-131%)	(1.1)
	(7.0%)x(115%-129%)	(1.0)
Total (2020 and 2023)		(8.4) – (2.0)
Total Consolidated Margin Erosion (A+B)		(5.8) - (5.9)

- From mix shift cases effect, upstream business segment makes mix problem margin more significant. Changes revenue of upstream high-margin segment, contributed significantly to the drag (-3.8 pp)
- The shift on gas trading and transport & distribution (1.0 pp) has provided contribution on the mix margin erosion for specifically compared to 2023 case.
- From both cases 3-5 years, showing consistently 5.8-5.9 pp consolidated margin erosion

Value Creation assessment

This analysis will use method: calculating ROIC, estimating WACC and then determining the economic profit. Based on 2025 Financial unaudited data.

Calculation of Return on Invested Capital (ROIC)

Data from 9M 2025 interim statements:

$Tax\ Rate$: $\frac{Income\ Tax\ Expense}{Operating\ Profit}$: $\frac{\$92,855,976}{\$383,088,767} = 21{,}5\%$

1. Total Asset: $6,140,628,225
2. Total NIBCLs Non-Interest-bearing current Liabilities: $701,411,763

$Invested\ Capital\ (30\ sep\ 2025)$: $\$6{,}140{,}628{,}225 - \$701{,}411{,}763 = \$5{,}439{,}216{,}462$

Invested Capital (31 Dec 2024) : $5,537,640,205

$ROIC: \frac{Annualized\ NOPAT}{Average\ Invested\ Capital}: \frac{\$383{,}088{,}767 * (1 - 0{,}215) * 12/9}{\$5{,}537{,}640{,}205} = 7.24\%$

Use annualized NOPAT to make more representative for final assessment

Estimate Weighted Average Cost of Capital

Few assumptions for this calculation:

- Cost Of Equity R_e using CAPM:
  - Risk Free Rate R_f: Based on the yield of Indonesia 10-year government bonds (FR0080) Approximately 6.8%
  - Beta (β): A beta 0.9 is reasonable estimate for low volatility gas infrastructure sector
  - Market Risk Premium (MRP), for Indonesia is higher than developed market a range. Range of 5-6% is often used, estimated to be about ~5,5%

$R_e = R_f + \beta * (MRP) = 6.8\% + (0.9 * 5.5\%) = 11.75\%$

- Cost of Debt R_d
  - Finance Cost: $493,358,188 (9M2025), use annualized $65,810,917
  - Average total Debt, we can approximate using loans and borrowing

    Average Debt: $\frac{Debt\ 30\ Sep\ 2025 + by\ 31\ Dec\ 2025}{2}$: $\frac{808{,}396{,}657 + 876{,}268{,}554}{2} = \$842{,}268{,}664$

    Pre tax R_d: $\frac{Annualized\ Finance\ Cost}{Average\ Debt} = \frac{\$65{,}810{,}917}{\$842{,}268{,}664} = 7.81\%$

    After tax R_d $7.81\% * (1 - 0.215) = 6.13\%$
- Capital structure (E/V and D/V)

- Market value of equity (E): Based on PGAS share price information estimated share price IDR 1,730 per share, then number of shares 24.24 billion shares.
  $E: \frac{1730\ IDR\ x\ 24{,}24\ billion}{16{,}500\ IDR/\$} = \$\ 2.54\ billion$
- Total Value (V) = E+D =$2,540,000,000 + $842,268,664 = $ 3,382,268,664
- $E/_V = \frac{\$2{,}540{,}000{,}000}{\$3{,}382{,}268{,}664} = 75.1\%$; $D/_V = \frac{\$\ 842{,}268{,}664}{\$3{,}382{,}268{,}664} = 24.9\%$

WACC Calculation = (75.1% x11.75%) + (24.9% x 6.13%) = 8.8%+ 1.5% = 10.35%

Compute Economic Profit

$$Economic\ Profit = (ROIC - WACC) * Invested\ Capital$$

= (7.24%-10.35%) x $5,537,640,205

= - $172,206,144

Based on the financial, PGAS is destroying shareholder value. The company's return on invested capital (7.24%), is significantly lower than its estimated cost of capital (10.9%). This negative spread of -3.11% in an estimated economic loss of $172 million for the period. For segmented calculations like below (some assumptions were made, due to limited data in the report).

Business Segment	NOPAT	Invested Capital	WACC	EVA (USD)
Downstream-Gas Trading	$ 232,560,420.82	$ 1,661,292,062	8.0%	99,657,055.9
Midstream - Transmission & Distribution	$ 104,251,223.13	$ 2,215,056,082	7.5%	(61,877,983.0)
Upstream (E&P)	$ 64,154,598.85	$ 1,661,292,062	10.0%	(101,974,607.3)

Table 10 Segmented Value Creation Assessment

Key Finding from the calculation:

- Upstream is the most value destructive segment due to high WACC and capital intensity
- Gas trading shows value creation, indicating relatively better performance compared to transmission and distribution segments

STRATEGY LEVERS

Based on the examination, PGAS exhibits a clear case of "portfolio drag." Where growth destroys value. Based on the analysis, it confirms that 49% of corporate capital is trapped in sub-WACC returns. While upstream segment shows high accounting margin (56%), which is primarily driver of value destruction. Current baseline 2025 are: Consolidated ROIC (7.24%), WACC (10.35%)

I: Capital light Transformation

Transform upstream asset from owner operator to JV and partial monetization, reducing invested capital by 40% while preserving 85% of NOPAT through retained equity and efficiency gains.

$New\ Invested\ Capital = \$1.66\ x\ 60\% = \sim 1.0\ B$

$New\ NOPAT = \$115M\ x\ 85\% = \sim 98\ M$

$$New\ ROIC = \frac{\$98M}{1.B} = 9.8\%\ (+3.1\ pp\ ROIC)$$

II: Monetizing the Monopoly

Secure a 10% tariff increase for Transmission & distribution (Estimated price: $2.3/MMBTU), and aImprove gas trading gross margin by 2% (Estimated margin: 21.5%)

$$T\&D\ Profit\ Increase\ (10\%\ Rev\ @44\%\ margin) = \$478M\ x\ 10\%\ x\ 44\% = \$21M$$

$Gas\ Trading\ (2\%\ COGS\ reduction)\$1{,}691M\ x\ 2\%$ = $33.8M

Total profit increase = $54.8 M (+0.7 PP ROIC)

III: Systemic Cost Reduction

Implement a structured program to reduce O&M cost by 5% and gas trading COGS by 1%

$$O\ \&\ M\ savings\ (T\&D\ and\ Upstream) = \$324M\ x\ 5\% = \$\ 16.2M$$

Trading COGS Savings - $1,691M X 1% -= $16.9M

Total Profit increase = $ 33.1M (+0.4 ROIC)

IV: Redirecting Growth

Reallocate 20% of CAPEX from gas trading to higher return T&D projects, improving T&D 1% percentage point.

Capex Reallocated = %80.7M x 20% = $16.1 M, improvement ROIC for 10.4%

T&D Profit Increase = $2,215 *1% = $22.2 M (+0.2 pp ROIC)

V: Accelerating value

Acquiring a small-scale LNG logistics company to capture high margin, offgrid demand

- Estimated acquisition price: $250M (reflects strategic premium for established player). Which Capital structure: 70% Debt and 30% equity
- Incremental NOPAT (year 3): $40M (16% from integrated operations)

Post Acquisition Invested Capital = Baseline Invested Capital + $250M

Post acquisition NOPAT: Baseline NOPAT + $40M ($175M debt x 6.13 after tax cost)

: $40M -$10.7M = $29.3 M (+0.3 ROIC pp, once fully integrated)

The true power is combination of those 5 strategy levers. Which projected into these tabulation

Scenario	Levers Applied	Projected ROIC	Economic Profit	Outcome
Base	-	7.24%	-$172M	Value Destruction
Operational Push	II+III+IV	8.54%	-$100M	Insufficient
Transformation	I+II+III+IV	9.48%	-$48M	Near Break Even
Unlock Potential	I+II+III+IV+V	9.78%	-$32M	Future Growth foundation

Table 11 Strategy Levers Combination

CONCLUSION & FINAL RECOMMENDATION

1. The integrated model demonstrates a clear and actional path forward of the company. By decisively and targeting restructuring the upstream segment and complementing it with operational efficiency program and a strategic growth acquisition, PGAS can fundamentally alter its economic trajectory
2. While the full transformation does immediately push ROIC slightly below 10.35% WACC, achieving 9.8% brings the company to the value creation and establishes strong foundation for future growth. The portfolio drag is eliminated and PGAS is repositioned as a modern, efficient and strategically leader, and will be known ready to tackle national toughest energy challenges for Indonesia.

REFERENCES

Barney, J. (1991). Firm Resources and Sustained Competitive Advantage. *Journal of Management, 17*(1), 99-120.

Damodaran, A. (2012). *Investment Valuation: Tools and Techniques for Determining the Value of Any Asset.*

ExxonMobil. (2024). 2024 GGlobal Outlook : A perspective on energy trends through 2050.

Ezekoye, O. (2025). *Portfolio Strategy*. Retrieved from www.mckinsey.com/.

Hedley, B. (1977). Strategy and the "Business Portfolio". *Long Range Planning, 10*(1), 9-15.

Koller, T., Goedhart, M., & Wessels, D. (n.d.). *Valuation: Measuring and Managing the Value of Companies.* 2020.

McKinsey & Company. (n.d.). *Capital Allocation,Portfolio Strategy,and Value Creation*. Retrieved from https://www.mckinsey.com/

Ministry of Energy and Mineral Resources, Republic of Indonesia . (2021). *Grand Strategy of Natural Gas National Utilization 2020-2045.*

Perusahaan Gas Negara. (2024). *Annual Financial Report* .

Perusahaan Gas Negara. (2025). *Investor Relation*. Retrieved from ir.pgn.co.id.

Sons, J. W. (n.d.). *Practical guidance on estimating beta, ERP, and WACC for Stage 3.*

Stewart, G. (1991). *Quest for Value : A Guide for Senior Managers.* New York: HarperCollins Publishers.

CHAPTER 6
Assessing the Financial Resilience of PT Adhi Karya (ADHI) through Z-Score Dynamics in the 2020-2024 Period Prior to a Merger with Another State-Owned Construction Company

Mr. Danang Arief NUGROHO
Institute IPMI, Indonesia
danang.nugroho@ipmi.ac.id
Orcid: 0009-0005-7426-4433

Mrs. Wiwiek Mardawiyah DARYANTO
Institute IPMI, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-35825857

Ms. Nayla Rasti ERMAWAN
Institute IPMI, Indonesia
nayla.ermawan@ipmi.ac.id
Orcid: 0009-0009-4134-1657

ABSTRACT

Indonesia's construction industry is facing increasing financial pressure, especially on State-Owned Enterprise (SOE) construction companies that play an important role in national infrastructure development. One of the crucial issues is the potential for financial distress, which if not detected early can disrupt the stability of strategic projects and weaken the sustainability of the company. The urgency of this research is strengthened by the government's plan to consolidate seven SOE construction, so that an objective evaluation of the financial condition of each entity, including PT Adhi Karya (Persero) Tbk (ADHI), is needed. This research aims to: 1) analyze the financial condition of PT Adhi Karya (Persero) Tbk (ADHI) during the period 2020-2024, 2) analyze the potential financial condition of ADHI if it plays a role as a leader in merger activities, and 3) analyze the potential financial condition of ADHI if it plays a role as a member in merger. The method used is the Modified Altman Z-Score (1995) with four financial ratios, using ADHI financial statement data for the 2020-2024 period. The results showed that ADHI was in a state of distress in 2020-2021, then improved to the grey area throughout 2022-2024. The capital structure ratio (X4) is the strongest indicator, while profitability (X3) is the weakest aspect. To enhance the accuracy of financial distress prediction, future studies are encouraged to combine the Altman Z-Score with additional models such as the Ohlson O-Score, Springate, or cash flow analysis, enabling a more comprehensive assessment of financial stability risks.
Keywords: Altman Z-score, State-Owned Enterprise (SOE), Financial Risk, Infrastructure

INTRODUCTION

As a developing country, Indonesia continues to accelerate infrastructure development to encourage economic growth. The development is supported by state-owned and private construction companies. Through various large infrastructure projects, the government allocates considerable funds to construction SOEs, so that they have an advantage over private construction companies (Wibowo et al., 2024a). The construction sector is a major pillar in national infrastructure development, where SOEs play a central role in the implementation of various strategic projects that have a major impact on the development of the country and the economy (Wibowo et al., 2024b). In their operations, SOEs are not always in a smooth situation. Various obstacles can arise and affect the company's performance, ranging from financial problems, suboptimal management, internal organizational problems, to weakening economic conditions (Waluyo et al., 2025). One of the prominent positive impacts of SOEs is their financial contribution to the state, although SOEs are often considered to have lower economic performance than non-SOEs (Ferdiana & Sugiyarto, 2022).

The topic of performance and corporate finance is still the main focus (Curi et al., 2025). Financial performance shows the results that a company has achieved in a given period (Karlina & Lako, 2020), which confirms that the corporate governance mechanism is indeed related to the company's financial performance (Kyere & Ausloos, 2021). Every business needs financial support to expand its operations, both domestically and abroad. For a business to grow from a small scale to a global one, financial strength is needed. Analysis of the company's financial condition can help organizations plan their business activities so that the business can run smoothly (Yahya et al., 2024). Ineffective management of SOEs can pose serious risks to fiscal policy and financial stability, and can hinder economic growth through decreased productivity (Böwer, 2017). Therefore, the company needs to continue to assess the company's financial condition and ensure that the company's bookkeeping, asset management, and finances remain well-controlled (OCDE, 2016), using data from financial statements, which is a summary of all business transactions that occur in a given period, which is compiled to provide important information for management to be able to make informed decisions (Sriwiyanti et al., 2024). Then, one of the biggest challenges companies face is the risk of financial distress, a condition in which the company's finances begin to deteriorate and may lead to bankruptcy if not addressed immediately. So this condition can be an early warning that the company is facing serious problems in its business (Kamila et al., 2025). This financial distress can arise from various internal factors, such as reduced revenue from lower sales, inefficient resource management, and a high debt burden. In addition, external factors can trigger financial distress, such as macroeconomic turmoil, regulatory changes that affect company operations, or increasingly fierce market competition. For this reason, effective predictive tools, such as financial statement analysis, are needed that are able to detect signs of financial distress early so that companies can take appropriate preventive measures (Cloudya & Safitri, 2025). Based on this, every stakeholder needs to monitor the company's financial condition so that the initial symptoms of financial difficulties can be identified, so that handling efforts can be carried out immediately (Sorout & Singh, 2025). Along with efforts to improve operational efficiency, competitiveness at the global level, and strengthen the capital structure, the Indonesian government through the Danantara initiative, is planning the merger of several construction SOEs, namely PT Adhi Karya (ADHI), PT Brantas Abipraya, PT Nindya Karya, PT Wijaya Karya (WIKA), PT PP (PTPP), PT Waskita Karya (WSKT), and PT Hutama Karya. The proposed merger scheme divides these seven companies into three large entities (Binekasri, 2025). The goal is so that strategic projects can be managed more optimally, resources are used efficiently, and the financial capacity of construction SOEs is stronger (Gerald et al., 2025).

One of the construction SOEs selected to participate in the merger process is PT Adhi Karya (Persero) Tbk (ADHI), which has long experience and strategic roles in the implementation of national

infrastructure projects, ranging from the construction of roads, railways, and buildings to large energy and civil construction projects. ADHI's strong position makes it an ideal candidate to lead or serve as a member in a merger scheme. Before the merger process is carried out, the first thing that needs to be considered is the company's financial performance and potential financial distress. Healthy financial conditions are the main factor that determines whether the company is able to take on the role of leader or member in the consolidation process (Andriani et al., 2024).

Various models have been developed to analyze financial ratios and predict the likelihood of financial distress. One of the most widely used models is the Altman Z-Score, which for more than 50 years has been a practical tool for estimating the potential bankruptcy of a company (Al-Manaseer & Al-Oshaibat, 2018; Altman, 2018; Ch & Zulfiati, 2019; Toly et al., 2020). It is known that the Altman Z-Score has undergone 3 changes, namely the first Altman Z-Score model in 1968 can be done only in open manufacturing companies, then the Altman Z-Score Revised in 1983 is a development of the previous formula so that it can be used in manufacturing companies both in the form of going public and private, and the last change, namely the Altman Z-Score Modification in 1995 is used by various types of industries that go public and private (Tania et al., 2021).

This research requires an effective measuring tool, and one of them is the Altman Z-Score, which can be used to predict financial hardship and bankruptcy risk (Aidi et al., 2022). As in previous research, to analyze financial distress also uses the Altman Z-Score, among others (Bertuah et al., 2022) which aims to analyze the influence of the implementation of Good Corporate Governance (GCG) and financial performance on the ability to predict financial distress in manufacturing companies in Indonesia, using the Altman Z-Score model. Then, research by (Aidi et al., 2022) with the aim of assessing the financial condition of companies in the transportation sector listed on the Indonesia Stock Exchange for the 2019-2021 period using the Altman Z-Score method. Furthermore, research from (Sriwiyanti et al., 2024) with its research which aims to assess Garuda Indonesia's bankruptcy risk using the Altman Z-Score model, by analyzing the company's financial statement data for the 2012-2021 period. Then, the results of his research show that during this period, Garuda Indonesia's financial condition was in the "grey area", which indicates financial difficulties. Some of these studies show that the Altman Z-Score can be used across sectors to assess a company's financial health.

Based on this, this study decided to use the Modified Altman Z-Score to analyze ADHI's financial condition. Then, the Altman Z-Score Model initially used five financial ratios, including Working Capital to Total Assets, Retained Earnings to Total Assets, EBIT to Total Assets, Equity Market Value to Total Debt, and Sales to Total Assets (Mastuti et al., 2012). However, in this study, only the first four ratios will be used, excluding the Sales to Total Assets ratio. This is because PT Adhi Karya, as a construction SOE, is "not like a company that conducts routine sales," as ADHI's revenue comes from large, long-term construction projects, so the ratio of sales to total assets is less relevant to reflecting the company's financial health or financial distress risk.

The data are sourced from the financial statements of PT Adhi Karya (Persero) Tbk. for the 2020-2024 period, providing a comprehensive picture of the company's financial dynamics before the merger process. This analysis also helps assess two scenarios of ADHI's role in the merger, namely as the leader of the merger with PT Nindya Karya and PT Brantas Abipraya (Lidyana, 2025) or as a member who follows the direction of the joint leader company PT PP (Persero) Tbk (Tonce, 2025). With this approach, the study not only assesses ADHI's financial condition, but also provides recommendations so that the merger can run smoothly and the consolidation goals are achieved optimally, as well as provides opportunities for innovation in analyzing the companies that will be merged, namely by using the Altman Z-Score analysis.

METHOD

This study uses data on the financial statements of PT Adhi Karya (Persero) Tbk (ADHI) for the period 2020-2024 with the purpose of the research to 1) analyze the financial condition of PT Adhi Karya (Persero) Tbk (ADHI) during the period 2020-2024, 2) analyze the potential financial condition of ADHI if it plays a role as a leader in merger activities, especially in the scenario of a joint merger of PT Nindya Karya and PT Brantas Abipraya, and 3) analyze the potential financial condition of ADHI if it plays a role as a member in merger activities, for example in the scenario of joining PT PP (Persero) Tbk (PTPP). To assess financial conditions and risk of financial distress, the Modified Altman Z-Score model (1995) was used. (Altman, 2018; Tania et al., 2021). This model focuses on four ratios, including: X1 which is the ratio of Working capital/Total assets, X2 with Retained Earnings/Total assets, then X3 with Earnings before interest and taxes/Total assets, and X4 with the ratio of Market value of equity/Book value of total liabilities which then, Z-Score is calculated with the formula:

$$\textbf{Z - Score (1995) = 6,56X1 + 3,26X2 + 6,72X3 + 1,05X4}$$

The company's classification is based on the Modified Z-Score, namely:

1. Companies with a Z-Score above 2.6 are considered healthy.
2. Companies with a Z-Score between 1.1 and 2.6 are in the gray zone and may face financial risk.
3. Companies with a Z-Score below 1.1 are in financial distress.

RESULT AND DISCUSSION

1. RESULT

Based on calculations using Altman Z-score using the financial statements of PT Adhi Karya (Persero) Tbk (ADHI) for the 2020-2024 period. The following are the results of the calculation.

Table 12: Financial Statement of PT Adhi Karya (Persero) Tbk (ADHI) for the Period 2020-2024

Aspect	2020	2021	2022	2023	2024
Working capital (Current Assets - Current Liabilities)	3,007,853,882,741	473,490,983,904	4,975,423,802,453	3,599,374,539,016	2,468,928,138,140
Total assets	38,093,888,626,551	39,900,337,834,619	39,986,417,216,654	40,492,030,620,079	35,042,781,072,073
Retained Earnings	1,989,824,895,076	2,041,377,034,231	2,114,788,477,042	2,337,427,819,257	2,551,533,865,030
Earnings before interest and taxes	1,008,032,859,535	1,121,060,745,373	1,069,919,829,414	1,444,124,639,006	702,100,847,972
Market value of equity	5,574,810,447,358	5,657,707,202,425	8,823,791,463,516	9,218,792,381,077	9,675,190,188,162
Book value of total liabilities	32,519,078,179,193	34,242,630,632,194	31,162,625,753,138	31,273,238,239,002	25,367,590,883,911

Source: ADHI's Company Financial Report (2025)

The Table 1. presents the company's financial performance from 2020 to 2024. Working capital fluctuated, with a significant increase in 2022 before decreasing again in 2023 and 2024. Total assets remained relatively stable until 2023 but experienced a noticeable decrease in 2024. Retained earnings show a consistent upward trend, indicating continuous profit accumulation. EBIT increased up to 2023 but recorded a sharp decrease in 2024. Meanwhile, the market value of equity continued to rise each year, reflecting increasingly positive market perceptions, and total liabilities decreased substantially in 2024, indicating a reduction in the company's financial obligations. Then, from the results of financial statements in the last five years, four financial ratios based on the Altman Z-score are calculated as modified in Table 2.

Table 13: Financial Ratio Based on Altman Z-Score Modification

Ratio		2020	2021	2022	2023	2024
X1	Working capital/Total assets	0.08	0.01	0.12	0.09	0.07
X2	Retained Earnings/Total assets	0.05	0.05	0.05	0.06	0.07
X3	Earnings before interest and taxes/Total assets	0.03	0.03	0.03	0.04	0.02
X4	Market value of equity/Book value of total liabilities	0.17	0.17	0.28	0.29	0.38

Source: Author (2025)

The table shows the company's financial ratios based on the modified Altman Z-Score from 2020 to 2024. Liquidity (X1) is very volatile, falling sharply to 0.01 in 2021, rising to its peak of 0.12 in 2022, and then settling at 0.07 in 2024. Retained Earnings (X2) increase slowly but steadily, staying at 0.05 from 2020–2022 and reaching 0.07 in 2024, showing consistent growth in the company's internal reserves. Profitability (X3) remains stable until 2023 but drops to 0.02 in 2024, indicating weaker operating performance. Capital Structure (X4) shows the strongest improvement, rising from 0.17 in 2020 to 0.38 in 2024, reflecting stronger market confidence and an increasingly resilient ability to cover liabilities. Then, after calculating four financial ratios, the Altman Z-Score Modified (1995) formula is used: Z-Score (1995) = 6.56*X1 + 3.26*X2 + 6.72*X3 + 1.05*X4. The following is Table 3 of the calculation results.

Table 14: Altman Z-Score Modified Calculation

Coefficient	Ratio	2020	2021	2022	2023	2024
6,56	X1	0.52	0.08	0.82	0.58	0.46
3,26	X2	0.17	0.17	0.17	0.19	0.24
6,72	X3	0.18	0.19	0.18	0.24	0.13
1,05	X4	0.18	0.17	0.30	0.31	0.40
Modified Z Score = Overall Index		**1.05**	**0.61**	**1.47**	**1.32**	**1.23**

Source: Author (2025)

The table shows the company's modified Altman Z-Score results from 2020 to 2024. X1 (liquidity) is unstable, rising in 2022 but decreasing again afterward. X2 (retained earnings) stays steady and slowly improves through 2024. X3 (profitability) is weak, dropping to 0.13 in 2024. X4 (capital structure) shows the strongest improvement, reaching 0.40 in 2024 and becoming the main factor supporting the company. The Modified Z-Score reached its highest level in 2022 at 1.47, then fell slightly to 1.23 in 2024. This means the company shows some recovery, but the score is still affected by volatile liquidity (X1) and low profitability (X3), even though capital structure (X4) continues to strengthen.

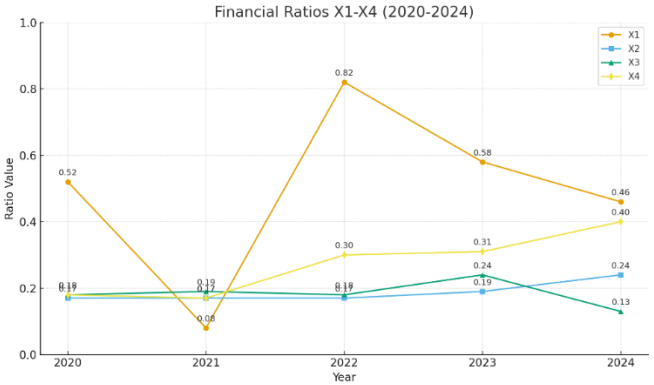


Figure 2 Financial Ratio Trend of PT Adhi Karya (Persero) Tbk from 2020 - 2024

The figure 1 illustrates the same trends shown in the previous table. X1 (liquidity) is the most volatile, dropping sharply in 2021 before jumping to its peak in 2022 and then decreasing again through 2024. X2 (retained earnings) shows a steady, gradual increase over the years. X3 (profitability) remains relatively stable until 2023 but then falls to its lowest point in 2024. Meanwhile, X4 (capital structure) shows the strongest and most consistent improvement, rising every year and reaching its highest value in 2024. This chart visually confirms the company's mixed performance improving capital structure, steady retained earnings, unstable liquidity, and weakening profitability and this trend provides the strongest financial resilience. Based on the results of the calculation of the Altman Z-Score using the formula, then based on the Z-Score criteria shown in the following Table 4:

Table 15: Determination of Criteria Z-Score

Year	Modified Z Score = Overall Index	Cut Off Value	Z-Score Criteria
2020	1,05	Z < 1,1	**Distress**
2021	0,61	Z < 1,1	**Distress**
2022	1,47	1,1 < Z < 2,6	**Grey**
2023	1,32	1,1 < Z < 2,6	**Grey**
2024	1,23	1,1 < Z < 2,6	**Grey**

Source: Author (2025)

Recovery from Distress, The Modified Z-Score (Overall Index) was in the Distress zone in 2020 (1.05) and critically low in 2021 (0.61), but successfully recovered to the Grey Zone in 2022 (1.47) and remained there through 2024 (1.23).

2. DISCUSSION

2.1 Analysis of ADHI's financial condition during the 2020–2024 period

Based on the calculation of the Modified Z-Score, the financial condition of PT Adhi Karya (Persero) Tbk (ADHI) fluctuated during the period 2020 to 2024. In 2020 and 2021, the Z-Score was 1.05 and 0.61, respectively, so the company was in the distress category. Pebriyani Research in Yonarta et al., (2024) explained that this situation was triggered by the COVID-19 pandemic, which had an impact on the construction industry through a decrease in project demand, disruption of cash flow, and a decrease in company profitability. The results of the financial ratio analysis show that the company's liquidity in this period is relatively low, as shown by the working capital to total assets ratio (X1) of 0.08 in 2020 and 0.01 in 2021. Profitability is also low, with the EBIT to total assets (X3) ratio of 0.03, while earnings to total assets (X2) retention is stable at 0.05. The company's capital structure is relatively better than other aspects,

as shown by the ratio of market value of equity to total liabilities (X4) of 0.17, which indicates the company's ability to bear liabilities despite financial pressures.

Entering 2022, the Z-Score increased to 1.47, included in the grey area category, indicating that financial risks are starting to decline. This increase was mainly driven by improved liquidity, with X1 rising to 0.12 and an improvement in capital structure with X4 by 0.28. Profitability remained stable at 0.03, while profit retention remained largely unchanged. The year 2023 shows a similar trend, with a Z-Score of 1.32. Liquidity decreased slightly to 0.09, but profitability began to improve with X3 of 0.04, while profit retention increased to 0.06. The company's capital structure also strengthened with X4 reaching 0.29. In 2024, the Z-Score is recorded at 1.23, still in the grey area, indicating that the company still faces potential risks. The X4 ratio stood out at 0.38, indicating that equity was getting stronger, but profitability decreased to 0.02, so more attention was needed to improve operational efficiency and profit performance. Overall, the X4 ratio has been the most positive indicator over the past five years as it shows an improvement in the capital structure, while the X3 ratio is the weakest ratio as profitability is affected by external conditions and fluctuations in construction projects.

This analysis of financial conditions is relevant to previous research that emphasized the use of Altman Z-Score or Z-Score modifications to predict financial distress in construction companies. For example Adwiwanzah and Albeta (2025) conducted a study on construction materials sub-industry manufacturing companies in Indonesia using the Z-Score method, showing that some companies are in the risk zone of bankruptcy. Similar research by Darmawan et al., (2025) found that construction companies in Indonesia, especially during the pandemic, experienced liquidity and profitability pressures that affected Z-Score's position. Then research from Sitompul and Syarif (2023) emphasizing that liquidity and other financial ratios have a significant influence on distress predictions, especially for construction companies that are sensitive to project fluctuations and macroeconomic conditions. These findings are in line with ADHI's conditions which showed low liquidity and profitability at the beginning of the pandemic, but improved gradually in the following years.

2.2 Potential Financial Condition of ADHI as a Merger Leader

If ADHI plays a leadership role in the joint merger of PT Nindya Karya and PT Brantas Abipraya, the company must have sufficient financial capabilities to assume strategic and operational responsibilities. Based on 2024 data, ADHI's Z-Score is 1.23, still in the grey area, indicating existing financial risks but not critical. In terms of liquidity, X1 (Working Capital/Total Assets) of 0.07 indicates that the company's working capital is relatively low. This is a challenge because as a merger leader, ADHI must be able to ensure sufficient cash flow to finance the coordination of the joint project, cover additional operational costs, and deal with liquidity risks that arise during the consolidation process. Meanwhile, X2 (Retained Earnings/Total Assets) of 0.07 indicates that retained earnings are starting to increase, so the company still has internal reserves to support the consolidation process. Overall, ADHI has enough foundation to play a leadership role, but to optimize that role, the company needs to increase liquidity and profitability in order to be able to effectively deal with operational and financial risks during the merger. In terms of capital structure, X4 (Market Value of Equity/Total Liabilities) of 0.38 indicates that the company has strong enough equity compared to liabilities, so that ADHI is able to bear some of the greater financial risks. This is an advantage for the position of leader, because it shows the ability of internal capital to support the merger strategy. Furthermore, in terms of profitability, X3 (EBIT/Total Assets) is only 0.02, indicating that the company's profit is relatively low compared to total assets. This is a major concern because low profitability can limit the company's flexibility in making strategic decisions, finance operational integrations, and support investment in joint projects.

2.3 Potential financial condition of ADHI as a member of the merger

As a member of a merger, for example joining PT PP (Persero) Tbk, ADHI is in a more flexible position and can adjust to the strategy of the leading company. In this scenario, the pressure of financial responsibility is lower, but the company's ability to contribute remains an important factor. ADHI's improved liquidity during 2022–2024, with X1 between 0.07-0.12, indicates that the company is able to meet internal working capital needs without having to incur large additional operating costs. This is sufficient to follow the direction of the merger leader and ensure that internal operations remain stable. In terms of profit retention, X2 which increased to 0.06-0.07 indicates the company's ability to hold profits to support the strategic needs of the merger, for example increasing reserves for joint projects or adjusting investment allocation according to the direction of the leader. Then in terms of relatively low profitability (X3), which is 0.02-0.04, it is not a significant obstacle for ADHI as a member because the company does not bear the main risk of merger management. However, low profitability still needs to be considered so that the company can make an optimal contribution to consolidation, for example, through operational efficiency and increased project revenue. Furthermore, ADHI's capital structure has a strong value (X4 = 0.38 in 2024), allowing ADHI to remain financially secure in the face of liabilities that may arise during the merger process. With this position, ADHI is stable enough to follow the direction of the leader, adjust its financial strategy, and focus on internal improvement so that the company's contribution to the merger becomes more optimal.

CONCULUSION

Based on the analysis of the Modified Z-Score and ADHI's financial ratios during the 2020-2024 period, it can be concluded that the company's financial condition has fluctuated, with significant pressure in 2020-2021 due to the COVID-19 pandemic. During that period, the company was in a distressed category, characterized by low liquidity, weak profitability, and limited retained earnings, although its capital structure remained relatively stable. In 2020-2021, a low X1 value indicates limited liquidity, and a low X3 value also indicates weak profitability, but at X2, it is still stable, indicating that retained earnings are still small, and the X4 value indicates a relatively more stable capital structure. From 2022 to 2024, ADHI's financial condition improved with Z-Score in the grey area, indicated by improved liquidity, increased retained earnings, and strengthening of the capital structure, although profitability remains a challenge. Then, in the context of mergers, ADHI has different potential outcomes depending on the role it takes. As a leader, the company has sufficient equity (X4) and retained earnings (X2) to support strategic and operational responsibilities, but low liquidity (X1) and profitability (X3) are challenges in managing financial and operational risks during the merger process. As a member, the company is in a more flexible position, with liquidity, retained earnings, and a capital structure sufficient to support its contribution to the merger, although low profitability needs to be considered for an optimal corporate contribution. X4 is the most positive financial indicator because it shows strengthening equity and the ability to bear liabilities, while X3 remains a weak ratio and requires attention to increase profitability. Thus, this research is expected not only to provide benefits in assessing the financial performance of PT Adhi Karya (Persero) Tbk as a whole, but also to be a basis for consideration for the government in planning and making decisions related to the SOE merger process, especially in managing financial risks and determining strategies to ensure that mergers run effectively.

Based on the results of the analysis of the financial condition of PT Adhi Karya (Persero) Tbk (ADHI) during the 2020-2024 period and its potential role in the merger process, several recommendations to support financial management and the company's readiness to face the merger:

1. Improve Liquidity (X1): ADHI needs stronger working capital to handle liquidity risks, especially if leading a merger. This can be done by improving cash flow, efficiency, and managing receivables and inventory better.
2. Use Retained Earnings (X2) and Strong Capital Structure (X4): The growth in X2 and X4 shows that ADHI has good internal reserves and equity, which can support the company's position in a merger.
3. Increase Profitability (X3): Profitability is still low. ADHI should focus on improving margins, project efficiency, and choosing better projects to raise its earnings.
4. Role Strategy in Mergers: If ADHI wants to lead the merger, it must strengthen liquidity and profitability first to handle higher risks and responsibilities.
5. Management should regularly monitor the company's financial performance and key ratios (X1–X4) each year. This helps the company quickly respond to internal or external changes, especially with the ongoing construction SOE merger plans.

Future researchers can use methods beyond the Modified Z-Score, such as the Ohlson O-Score, the Springate Model, or cash flow analysis, to obtain a more comprehensive view of financial distress. They can also compare ADHI's financial condition with that of other construction SOEs that may join as members or leaders in a merger, thereby making the analysis more comprehensive.

REFERENCES

Adwiwanzah, D. Z., & Albeta, F. R. (2025). Analisis Prediksi Kebangkrutan dengan Menggunakan Metode Altman Z-Score pada Perusahaan Manufaktur Subindustri Material Konstruksi. *RIGGS: Journal of Artificial Intelligence and Digital Business*, *4*(2), 1701–1710. https://doi.org/10.31004/riggs.v4i2.724

Aidi, A., Setiawan, T. W., Junaidi, A., Budiwaluyo, A., & Agoestyowati, R. (2022). Analysis of Financial Health Level Using the Z-Score (Altman) Method in Transportation Companies Listed on the Indonesia Stock Exchange for the 2019-2021 Period. *Ilomata International Journal of Tax and Accounting*, *3*(4), 461–473. https://doi.org/10.52728/ijtc.v3i4.605

Al-Manaseer, S., & Al-Oshaibat, S. (2018). Validity of Altman Z-Score Model to Predict Financial Failure: Evidence From Jordan. *International Journal of Economics and Finance*, *10*(8), 181–189. https://doi.org/10.5539/ijef.v10n8p181

Altman, E. I. (2018). Applications of Distress Prediction Models: What Have We Learned After 50 Years from the Z-Score Models? *International Journal of Financial Studies*, *6*(70), 1–15. https://doi.org/10.3390/ijfs6030070

Andriani, R., Tambunan, D., & Herlan, H. (2024). Merger and Business Consolidation Among Indonesian ' S Bumn Karya : A Strategy to Avoid Financial Distress and Strengthening Capital For Long-Term Sustainability. *Dynamic Management Journal*, *8*(4), 1032–1050. https://doi.org/http://dx.doi.org/10.31000/dmj.v8i4 ISSN

Bertuah, E., Munandar, A., Destriwanti, O., & Sintha, L. (2022). Analyzing the impact of Good Corporate Governance and Financial Performance on predicting Financial Distress using the modified Altman Z Score model. *American International Journal of Business Management (AIJBM)*, *5*(02), 27–36.

Binekasri, R. (2025, July 31). 7 BUMN Karya Mau Digabung Jadi 3, Intip Rapor Kinerjanya. *CNBC Indonesia*. https://www.cnbcindonesia.com/market/20250731125335-17-653884/7-bumn-karya-mau-digabung-jadi-3-intip-rapor-kinerjanya

Böwer, U. (2017). *State-Owned Enterprises in Emerging Europe: The Good, the Bad, and the Ugly* (WP/17/221).

Ch, F. N., & Zulfiati, L. (2019). Financial Distress Analysis with Altman Z Score Method and Value of SOEs Listed on BEI. *Proceedings of the 5th Annual International Conference on Accounting Research (AICAR 2018)*, *73*, 47–51. https://doi.org/10.2991/aicar-18.2019.11

Cloudya, A., & Safitri, E. (2025). Analysis of Financial Reports in Financial Distress Prediction with Altman Z-Score and Zmijewski Method on Lq45 Indexed Companies on BEI. *Proceeding International Conference on Economic Business Management, and Accounting (ICOEMA) 2025 Program Studi Doktor Ilmu Ekonomi Universitas 17 Agustus 1945 Surabaya*, 76–88.

Curi, C., Mancuso, P., & Scarpa, A. (2025). State-Owned Enterprises: A Bibliometric Review And Research Agenda. *Finance Research Letters*, *74*(December 2024), 106749. https://doi.org/10.1016/j.frl.2025.106749

Dimas Dwi Darmawan, Ujang Suherman, & Rengga Madya Pranata. (2025). Metode Altman Z-Score untuk Memprediksi Financial Distress Perusahaan Bidang Konstruksi pada Tahun 2020 -2023. *Al-Kharaj: Jurnal Ekonomi, Keuangan & Bisnis Syariah*, *7*(8), 2550–2564. https://doi.org/10.47467/alkharaj.v7i8.7905

Ferdiana, N., & Sugiyarto, T. (2022). State-Owned Enterprises (SOEs): The Role in Economic Development and The Determinant of Its Performance. *Jurnal Ekonomi Dan Kebijakan Pembangunan*, *11*(2), 91–107. https://doi.org/10.29244/jekp.11.2.2022.91-107

Gerald, R., Grisanto, S., Wiryono, S. K., Sunitiyoso, Y., Gerald, R., & Grisanto, S. (2025). Key drivers for successful integration

of Indonesian State-Owned Holding : a Soft Systems Methodology approach Key drivers for successful integration of Indonesian State-Owned Holding : a Soft Systems Methodology approach. *Cogent Business & Management*, *12*(1). https://doi.org/10.1080/23311975.2025.2483378

Kamila, A. F., Faruq, U., & Subairi, S. (2025). Financial Distress Analysis Using the Altman Z-Score Model on Textile Companies in Indonesia Stock Exchange. *Jurnal Ilmiah Multidisiplin Indonesia*, *4*(6), 447–454. https://doi.org/10.58471/esaprom.v4i06

Karlina, Y., & Lako, A. (2020). The Impact of Financial Performance, Financial Risk, Liquidity, and Corporate Governance on Corporate Value. *Journal Of Management and Business Environment ISSN*, *1*(2), 154–177.

Kyere, M., & Ausloos, M. (2021). Corporate governance and firms financial performance in the United Kingdom. *International Journal of Finance & Economics*, *26*(2), 1871–1885. https://doi.org/10.1002/ijfe.1883

Lidyana, V. (2025, September 29). Danantara Kejar Penyelesaian Merger BUMN Karya di Akhir 2025. *IDN Times*. https://www.idntimes.com/business/economy/danantara-kejar-penyelesaian-merger-bumn-karya-di-akhir-2025-00-3m8tp-smwxzm

Mastuti, F., Saifi, M., & Azizah, D. F. (2012). Altman Z-Score Sebagai Salah Satu Metode dalam Menganalisis Estimasi Kebangkrutan Perusahaan. *Jurnal Administrasi Bisnis (JAB)*, *6*(1), 1–10. http://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/viewFile/268/461

OCDE. (2016). *Risk Management by State-Owned Enterprises and their Ownership*. OECD Publishing. https://doi.org/http://dx.doi.org/10.1787/9789264262249-en

Sitompul, Y. K., & Syarif, A. D. (2023). Analysis of Financial Distress in Construction Companies with the Altman Method. *Journal of Economics, Finance and Management Studies*, *06*(06), 2817–2823. https://doi.org/10.47191/jefms/v6-i6-47

Sorout, A., & Singh, N. P. (2025). Bankruptcy Prediction Using The Altman Z-Score Modification Model in India: A Case Study of Bharti Airtel Limited. *Southeast Asian Business Review*, *3*(1), 12–33. https://doi.org/10.20473/sabr.v3i1.63958

Sriwiyanti, E., Purba, D. S., Wahyudi, D., Tarigan, W. J., & Napitu, R. (2024). Implementation of the Altman Z-Score Model in Predicting Bankruptcy at PT. Garuda Indonesia, Tbk. *Journal of Accounting and Investment*, *25*(1), 249–268. https://doi.org/10.18196/jai.v25i1.20223

Tania, S., Pratiwi, L. N., & Laksana, B. (2021). Prediksi Kebangkrutan Menggunakan Metode Altman Z-Score Modifikasi pada PT Inti (Persero). *Indonesian Journal of Economics and Management*, *1*(3), 628–633.

Toly, A. A., Permatasari, R., & Wiranata, E. (2020). The Effect of Financial Ratio (Altman Z-Score) on Financial Distress Prediction in Manufacturing Sector in Indonesia 2016-2018. *Proceedings of the 23rd Asian Forum of Business Education(AFBE 2019)*, *144*(Afbe 2019), 47–53. https://doi.org/10.2991/aebmr.k.200606.008

Tonce, D. D. (2025, November 5). Kajian Terus Berjalan, Merger BUMN Karya Ditargetkan Rampung Paling Lambat 2026. *Bisnis.Com*. https://market.bisnis.com/read/20251105/192/1926309/kajian-terus-berjalan-merger-bumn-karya-ditargetkan-rampung-paling-lambat-2026#goog_rewarded

Waluyo, W., Tegnan, H., & Setiowati, N. O. (2025). Aligning State Finance Regulations with SOE Bankruptcy Policy: Evidence from the United States. *Journal of Human Rights, Culture and Legal System*, *5*(1), 246–278. https://doi.org/10.53955/jhcls.v5i1.470

Wibowo, F. A., Satria, A., Gaol, S. L., & Indrawan, D. (2024a). Financial Risk, Debt, and Efficiency in Indonesia's Construction Industry: A Comparative Study of SOEs and Private Companies. *Journal of Risk and Financial Management*, *17*(7), 303. https://doi.org/10.3390/jrfm17070303

Wibowo, F. A., Satria, A., Gaol, S. L., & Indrawan, D. (2024b). Foresight for SOE Companies in Indonesia's Construction Industry: Recognizing Future Opportunities. *Sustainability (Switzerland)*, *16*(23), 1–23. https://doi.org/10.3390/su162310384

Yahya, M. F. M., Jannah, A. W., Prastika, D. A., & Iswahyudi, M. (2024). State Owned Enterprises in Indonesia: Bankruptcy Analysis. *Proceedings of International Conference on Economics Business and Government Challenges*, *1*(1), 7–13.

Yonarta, S. N. S., Purnama, W. A., & Soeroto, W. M. (2024). Analisa Modal Kerja Terhadap Kinerja Keuangan PT Adhi Karya (Persero) Tbk. *Sebatik*, *28*(1), 9–15. https://doi.org/10.46984/sebatik.v28i1.2379

CHAPTER 7
Financial Performance Evaluation of PT Telkom Indonesia (Persero) Tbk Using Financial Ratio Analysis from 2020 to 2024

Ary HARTONO
IPMI Institute, Indonesia
ary.hartono@ipmi.ac.id
Orcid: 0009-0009-3892-2629

Philip IMMANUEL
IPMI Institute, Indonesia
philip.immanuel@ipmi.ac.id
Orcid: 0009-0009-9339-3803

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

ABSTRACT

This study aimed to analyze the financial performance of PT Telkom Indonesia (Persero) Tbk from 2020 to 2024 using a comparative financial ratio analysis, addressing fluctuations in the company's performance that reflect its ability to maintain stability and efficiency in a dynamic business environment. Using a descriptive comparative approach, the study examined liquidity, solvency, activity, and profitability ratios based on secondary data from audited annual financial reports published by the Indonesia Stock Exchange. The findings revealed distinct variations across the five-year period: in 2020, liquidity increased due to rising fixed broadband demand during the pandemic, although profitability was pressured by higher operating costs; in 2021, profitability and asset utilization strengthened as data consumption grew, with solvency remaining stable; in 2022, liquidity improved following operational restructuring, but solvency showed initial signs of weakening due to higher long-term obligations; in 2023, profitability rose significantly supported by digital service expansion and operational efficiency, even as activity ratios slightly decreased due to asset consolidation; and in 2024, liquidity remained strong and profitability continued to grow, although solvency declined marginally amid increased investment in digital infrastructure. Overall, the study concluded that PT Telkom Indonesia maintained relatively stable financial conditions throughout the period, supported by effective operational management, although continuous efficiency enhancements remain necessary for long-term sustainability.
Keywords: Financial Performance, Financial Ratio Analysis, Comparative Analysis.

INTRODUCTION

The global telecommunications industry has undergone significant transformation over the past decade, driven by rapid technological advancement, accelerating digital adoption, and rising demand for high-speed connectivity. As digital ecosystems mature, telecom operators have shifted from being traditional infrastructure providers to becoming core enablers of digital economies (GSMA Intelligence, 2024). In Indonesia one of the fastest-growing digital markets in the region this shift has been even more pronounced. Internet penetration reached 74.6% in early 2025, supported by widespread smartphone adoption and the surge of data-driven lifestyles, e-commerce, cloud services, and digital payment ecosystems, all of which intensified the need for robust and scalable telecommunications infrastructure (DataReportal, 2025). Correspondingly, PT Telkom Indonesia has advanced its strategic transformation into a "digital telco," expanding its portfolio beyond connectivity toward digital platforms such as data centers, cloud computing, and integrated digital services, reinforcing its central role in Indonesia's ongoing digital transformation (Telkom Indonesia, 2023; Firza, 2023).

The period from 2020 to 2024 presented unprecedented challenges and major inflection points for Telkom and the broader telecommunications industry. The COVID-19 pandemic significantly altered consumption patterns, shifting demand from mobility-based services to home-based connectivity as customers increasingly relied on video conferencing, streaming, and other data-intensive applications (ITU, 2021). This behavioral shift required telecom operators to rapidly reallocate resources, expand network capacity, and accelerate digital infrastructure initiatives to maintain service quality during surging traffic. At the same time, competitive pressures escalated, particularly in Indonesia's mobile and fiber broadband markets, as operators intensified price competition and expanded fiber-to-the-home (FTTH) coverage (OECD, 2022). Furthermore, the ongoing convergence between traditional telecommunications services and digital platforms such as cloud computing, digital media, and enterprise digital solutions demanded higher capital expenditure, increased operational efficiency, and strategic realignment across the industry (McKinsey, 2023).

These structural changes raise critical questions about the company's financial sustainability, particularly in terms of liquidity, solvency, operational efficiency, and profitability. Telecom companies operate within capital-intensive business models that require continuous investment in network modernization, spectrum acquisition, and technology upgrades. As a result, financial ratio analysis becomes essential in assessing the company's ability to maintain stable performance while implementing long-term strategic initiatives. Evaluating Telkom's multi-year financial performance helps determine whether the company has efficiently managed its assets, controlled leverage levels, and generated sufficient returns amidst evolving market dynamics.

While financial performance analyses of telecommunications companies are well-established in global literature, empirical studies within the Indonesian context remain relatively fragmented. Most prior research focuses on single-dimension assessments such as profitability, leverage, or liquidity without employing a comprehensive, multi-ratio evaluation across multiple years (Sari & Puspitasari, 2021). Moreover, academic work specifically examining PT Telkom Indonesia during the post-pandemic recovery period is still limited, despite the company undergoing substantial restructuring, accelerating digital transformation initiatives, and experiencing shifts in its revenue composition (Pratama & Hidayat, 2023). This gap is notable because Indonesia's telecom sector has rapidly evolved following COVID-19, requiring more integrated analyses that capture liquidity strength, solvency stability, operational efficiency, and profitability dynamics simultaneously (APJII, 2022). Therefore, conducting a holistic financial evaluation of Telkom Indonesia is

both academically valuable and practically relevant, particularly as the firm continues to reposition itself within the digital economy landscape.

In this context, the present study aims to provide a comprehensive financial ratio analysis of Telkom Indonesia from 2020 to 2024, employing liquidity, solvency, activity, and profitability indicators to capture the company's financial condition before, during, and after the pandemic-induced digital surge. By comparing multi-year trends, the study seeks to identify patterns of stability, fluctuation, or improvement in response to internal corporate strategies and external macroeconomic forces. Ultimately, this research contributes to a deeper understanding of the financial resilience of Indonesia's largest telecommunications provider and offers insights that may guide future strategic decisions, investor assessments, and policy discussions.

To guide the analysis and provide a clear direction for the empirical investigation, this paper seeks to answer the following research question:

1. How did the financial performance of PT Telkom Indonesia (Persero) Tbk develop during the period 2020–2024 as measured through liquidity, solvency, activity, and profitability ratios?
2. How did Telkom Indonesia's liquidity performance change throughout 2020–2024?
3. How did the company's solvency and financial leverage evolve over the same period?

LITERATURE REVIEW

2.1 Financial Performance

Financial performance refers to a company's ability to generate profit, maintain operational efficiency, and sustain long-term growth. According to Brigham & Houston (2021), financial performance represents "the overall effectiveness with which a firm utilizes its resources to generate value for shareholders." Strong financial performance also reflects sound managerial decisions, effective cost control, and strategic resource allocation. Gitman & Zutter (2015) emphasize that financial performance is best evaluated through systematic analysis of financial statements, which serve as the primary tool for assessing a firm's condition, risk profile, and profitability.

In the telecommunications sector, financial performance plays a critical role because firms operate in highly capital-intensive environments that demand ongoing investment in network infrastructure, spectrum, and digital platforms. According to the OECD (2019), telecom operators must consistently commit large capital expenditures to expand and modernize their networks, making it essential for them to maintain stable revenue streams to ensure long-term financial sustainability. Similarly, GSMAi (2020) highlights that balancing substantial infrastructure investment with healthy cash flow generation is fundamental for telecom firms to remain competitive in a rapidly evolving digital landscape.

2.2 Financial Ratio Analysis

Financial ratio analysis is a widely used analytical framework that transforms numerical accounting data into meaningful indicators of performance. As Ross et al (2022) explain, "ratios allow analysts to compare companies of different sizes and to evaluate trends across time." Ratios are commonly grouped into several categories liquidity, solvency, activity, and profitability each providing distinct insights into the firm's financial condition.

1. Liquidity Ratios

Liquidity ratios measure the firm's ability to meet short-term obligations. Brigham & Houston (2021) state that liquidity is essential for maintaining business continuity, particularly during periods of economic uncertainty. The current ratio and quick ratio are typically used to assess a firm's immediate financial flexibility. According to FreshBooks (2024), maintaining the liquidity ratios with good current ratio by 1.2 until 2 will leverage an opportunity for growth and long term business credibility

2. Solvency (Leverage) Ratios

Solvency ratios assess long-term financial stability by measuring how much debt a company uses to finance its assets. According to Higgins (2015), high leverage can amplify returns but also increases financial risk, especially for industries with volatile cash flows. Telecommunications companies often exhibit higher leverage because of large, long-term investments.

3. Activity (Efficiency) Ratios

Activity ratios evaluate how efficiently a company utilizes its assets to generate revenue. Gitman & Zutter (2015) assert that efficiency ratios reflect managerial effectiveness in managing working capital, assets, and operational processes.

4. Profitability Ratios

Profitability ratios reflect the company's ability to generate earnings relative to its resources. Palepu et al (2019) highlight that profitability is a key indicator of competitive advantage, strategic success, and long-term sustainability. Common measures include ROA, ROE, and net profit margin. According Maverick (2022), With the objectives of maintaining the average of profitability margin upper than 15% for better peers analysis in profitability ratios

2.3 Financial Performance in the Telecommunications Industry

The telecommunications industry is notably capital-intensive and subject to rapid technological change, which requires operators to continuously invest in infrastructure such as fiber networks, 5G, and cloud platforms. According to Infosys (2024), telecom companies now need to diversify beyond traditional voice and data services toward more industry-specific digital solutions (e.g., edge computing) to monetize these investments.

Several studies have analyzed financial performance in this sector. Mudanya et al (2022) found that telecom companies' profitability is significantly influenced by economies of scale and efficient asset utilization. Kumar & Singh (2020) reported that solvency ratios often fluctuate due to CapEx cycles, whereas liquidity tends to remain stable due to recurring cash flows from subscription services.

2.4 Financial Performance in the Indonesian Telecommunications Context

The Indonesian telecommunications industry has experienced rapid digital adoption, driven by increased smartphone penetration, rising demand for mobile data, and expansion of broadband services. Setiawan & Venona (2023) emphasizes that Indonesia's digital economy is one of the fastest-growing in Southeast Asia, placing significant demands on network capacity and operational efficiency.

However, competition remains intense in the mobile and fixed broadband segments. As shown by Samsinar

et al (2023), Indonesian telecom companies like Telkom and Indosat face strong competitive pressure, but Telkom Indonesia exhibits higher solvency ratios compared to its peers. Furthermore, analysis of Telkom Indonesia's financial performance over 2020 - 2024 indicates that while its profitability declined, the company maintained financial stability through improved debt management and liquidity.

Despite the availability of financial research on Indonesian telecom firms, few studies focus specifically on Telkom Indonesia's multi-year performance covering the pandemic period. Most existing studies examine single-year profitability or partial ratio analyses. This creates a research gap, particularly when considering large-scale organizational changes such as Telkom's data center expansion, digital infrastructure investment, and structural reorganization (e.g., IndiHome integration into Telkomsel).

METHODOLOGY

This research employs a descriptive quantitative approach to evaluate the financial performance of PT Telkom Indonesia (Persero) Tbk during the period 2020–2024. The descriptive method is appropriate because the study aims to present, interpret, and compare historical financial ratio trends without manipulating variables or conducting predictive modelling. This approach supports an objective assessment of Telkom's financial condition amid post-pandemic economic recovery and intensifying digital transformation.

3.1 Data Source and Collection Procedure

The study relies solely on secondary data, obtained from:

1. Audited Annual Reports of PT Telkom Indonesia 2020–2024
2. Sustainability Reports and Financial Statements published on IDX
3. Supporting references: industry publications & scholarly articles for interpretation context

All financial items (assets, liabilities, revenue, equity, expenses, net income) were systematically extracted and tabulated into a structured dataset. Cross-check validation was carried out by matching figures across auditor notes, statement of financial position, and income statement to ensure reliability.

3.2 Financial Ratio Formulas Used

Analysis covers four ratio categories, using standard formulas as follows:

1. Liquidity Ratios

$$\text{Current Ratio} = \frac{\text{Current Assets}}{\text{Current Liabilities}}$$

Quick Ratio (Acid-Test Ratio)

$$\text{Quick Ratio} = \frac{\text{Current Assets} - \text{Inventories}}{\text{Current Liabilities}}$$

2. Solvency Ratios

Debt to Equity Ratio (DER)

$$\text{Debt to Equity Ratio} = \frac{\text{Total Debt}}{\text{Total Equity}}$$

Debt to Asset Ratio (DAR)

$$\text{Debt to Asset Ratio} = \frac{\text{Total Debt}}{\text{Total Assets}}$$

3. Activity Ratio

Asset Turnover Ratio

$$\text{Total Asset Turnover} = \frac{\text{Net Sales}}{\text{Total Assets}}$$

Inventory Turnover

$$\text{Inventory Turnover} = \frac{\text{Cost of Goods Sold (COGS)}}{\text{Average Inventory}}$$

Receivable Turnover

$$\text{Receivables Turnover} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$$

4. Profitability Ratios

Return on Assets (ROA)

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

Return on Equity (ROE)

$$\text{ROE} = \frac{\text{Net Income}}{\text{Shareholders' Equity}}$$

Net Profit Margin (NPM)

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Net Sales}} \times 100\%$$

3.3 Analytical Technique

A comparative financial ratio analysis was conducted where all ratio values across 2020–2024 were compared to identify:

1. Trend direction (improving/declining/stagnant)
2. Earnings quality & capital structure resilience
3. Liquidity adequacy & asset utilisation efficiency

Interpretation was strengthened by linking ratio movements with corporate developments such as revenue diversification, digital service expansion, and capital expenditure behaviour.

3.4 Scope and Limitation

The study focuses strictly on internal performance analysis, excluding market-based metrics (stock price, investor sentiment) and competitor benchmarking. This boundary ensures analytical depth but opens future research potential for external comparative valuation.

CONCLUSION

This study analyzed the financial performance of PT Telkom Indonesia (Persero) Tbk from 2020 to 2024 using a comprehensive financial ratio evaluation covering liquidity, solvency, activity, and profitability indicators. The results show that Telkom Indonesia was able to maintain overall financial stability during a period of substantial transformation within the telecommunications industry, driven by pandemic induced shifts in consumer behavior, increased demand for digital services, and intense market competition in both mobile and fixed broadband segments.

The liquidity analysis indicates that Telkom strengthened its ability to meet short-term obligations, supported by stable cash flows and recurring revenues from subscription-based services. Solvency ratios reveal that the company maintained a manageable level of financial leverage, even as it continued to invest heavily in digital infrastructure, fiber expansion, and data center development. Activity ratios demonstrate consistent efficiency in utilizing assets to generate revenue, which is important in an industry characterized by high fixed costs and significant infrastructure investment. Profitability ratios improved over time, particularly as digital services such as mobile data, enterprise connectivity, and cloud solutions became increasingly dominant contributors to revenue growth.

Overall, the study concludes that Telkom Indonesia exhibited strong financial resilience throughout the 2020 - 2024 period, supported by effective operational management, strategic investment decisions, and a well-diversified business portfolio. These findings underscore the company's capacity to adapt to technological change, navigate market competition, and sustain long-term value creation.

While this study provides useful insights, future research may expand by comparing Telkom's performance with other telecommunications operators in Indonesia, integrating market-based indicators such as stock returns, or applying advanced analytical methods such as panel data analysis, forecasting models, or benchmarking against global telecom firms. Such extensions would offer a broader perspective on competitiveness and financial sustainability within the rapidly evolving digital economy.

REFERENCES

Brigham, E. F., & Houston, J. F. (2021). *Fundamentals of Financial Management* (16th ed.). London : Cengage Learning.

FreshBooks. (2024). *What Is a Good Liquidity Ratio?* FreshBooks. https://www.freshbooks.com/hub/accounting/good-liquidity-ratio?srsltid=AfmBOopdDp3J7YvaOesf3WLGnD6-s3WdpVPUfNUcBs36LBqPk3cuLRIx

Gitman, L. J., & Zutter, C. J. (2015). *Principles Of Managerial Finance* (14th ed.). Boston : Pearson Education.

GSMAi. (2020). *Global Mobile Trends 2021 Navigating Covid-19 and Beyond*. Global System for Mobile Communications Association Intelligence.

Higgins. (2015). *Analysis for Financial Management* (11th ed.). New York : McGraw-Hill Education.

Infosys. (2024). *Telecom Industry Outlook 2024*. Infosys.

Kumar, A., & Singh, R. (2020). The Role of Predictive Analytics in Financial Decision-Making: a Literature Review. *Journal of Financial Management*, *20*(2), 134–150.

Maverick, J. B. (2022). *Average Profit Margin for Telecommunications Agency: Overview*. Investopedia. https://www.investopedia.com/ask/answers/060215/what-average-profit-margin-company-telecommunications-sector.asp

Mudanya, E., Kadima, J. M., & Miroga, J. (2022). Credit Risk Management Practices and Financial Performance of Commercial Banks in Kenya: A Case of Banks in Vihiga County. *The Strategic Journal of Business & Change Management*, *9*(2), 305–316.

Palepu, K. G., Healy, P. M., & Peek, E. (2019). *Business Analysis and Valuation* (5th ed.). London : Cengage Learning EMEA.

Ross, S., Westerfield, R., & Jordan, B. (2022). *Fundamentals of Corporate Finance* (4th ed.). New York : McGraw-Hill.

Samsinar, S., Ambarwati, D., & Zamzam, N. A. A. N. (2023). Analisis Komparatif Kinerja Keuangan pada Perusahaan PT. Telekomunikasi Indonesia TBK dan PT. Indosat TBK. *Jurnal Ekonomi, Bisnis Dan Manajemen*, *2*(4), 40–57.

Setiawan, T., & Venona, V. (2023). Pengaruh Kinerja Keuangan Dan Kepemilikan Terhadap Nilai Perusahaan Untuk Saham Terindeks LQ 45. *Owner : Riset Dan Jurnal Akuntansi*, *7*(2), 1137–1148.

CHAPTER 8
Assessing the Impact of the COVID-19 Pandemic on the Financial Performance of PT Samudera Indonesia

Adnan Garry KURNIAWAN
IPMI Institute, Indonesia
adnan.kurniawan@ipmi.ac.id
Orcid: 0009-0000-2890-8422

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

Monica Christine SIMANJUNTAK
IPMI Institute, Indonesia
monica.simanjuntak@ipmi.ac.id
Orcid: 0009-0006-3230-0755

ABSTRACT

Financial ratio analysis of PT Samudera Indonesia over the 2020–2024 period reveals measurable differences in performance between the pre-pandemic and post-pandemic phases. The study was driven by the profound disruptions caused by COVID-19 to international trade and logistics, sectors that form the backbone of global supply chains. Adopting a quantitative descriptive design, the analysis relies on audited financial reports of PT Samudera Indonesia obtained from the Indonesia Stock Exchange (IDX) and the company's official website through the Investor Relations section. Key economic indicators, including measures of liquidity, profitability, solvency, and activity, were examined to compare financial stability and operational efficiency before and after the pandemic. The evaluation reveals a pronounced decline in profitability in 2020, followed by a steady recovery pattern in subsequent years, demonstrating the company's ability to adapt through strategic cost management and operational adjustments. These findings highlight the resilience of maritime transport enterprises in Indonesia and provide empirical insight into how financial soundness and adaptive management practices support long-term recovery during global economic disruptions.
Keywords: COVID-19, Pandemic, PT Samudera, Indonesia.

1. INTRODUCTION

The COVID-19 pandemic has caused disruption to the world economy, especially in those sectors that rely on international trade and logistics. Limits imposed on mobility and supply chains led to a reduction in transported cargo and created uncertainty for the world's shipping lines (Notteboom et al., 2021). In the case of Indonesia, which is an archipelago and for which maritime logistics are very important for the economy, the implications were substantial for the financial viability of the large shipping lines, as the effect of lowered shipping volumes negatively impacted efficiency and earning capacity (Rodrigue, 2020).

PT Samudera Indonesia Tbk, one of the leading names in the shipping and integrated logistics business, felt the direct effects of such markets. Another aspect that became of prime concern during the pandemic era is the ability of the business to maintain and adapt in the face of unprecedented pressure, which has been evident in the extent of fluctuation reported within their annual financial statements (Samudera Indonesia Annual Report, 2021).

Though many, such as Rodrigue (2020), Notteboom & Pallis (2021), and Yuen et al. (2022) have investigated the cost implications of COVID-19 in the maritime and logistics industry around the world, little attention has been given to the maritime logistics industry in Indonesia. Further, in spite of testing the difference in the performance of the industry in the year of pandemic (2020) and during the period of recuperation (2023), none of them have made use of analytical techniques that can reveal the factors causing profitability, such as DuPont analysis (Penman, 2013).

To address this gap, the present study evaluates PT Samudera Indonesia's financial performance from 2019 to 2023 using audited financial statements sourced from the company's Investor Relations portal of Samudera Indonesia. The analysis examines liquidity, profitability, and activity ratios and incorporates the **DuPont financial model** to break down Return on Equity (ROE) into net profit margin, asset turnover, and financial leverage. This approach provides deeper insight into the mechanisms influencing profitability and operational efficiency throughout the pandemic period and subsequent recovery.

The findings of this research are expected to highlight the company's adaptive strategies and financial resilience and contribute to a broader understanding of how shipping and logistics enterprises can maintain long-term stability during large-scale global disruptions. Existing studies do not extensively explore the performance of Indonesian maritime logistics firms across both the pandemic and recovery phases. Additionally, most analyses rely solely on financial ratios without integrating the DuPont model to identify internal drivers of ROE change. This gap supports the need for a study that evaluates financial performance before and after the pandemic using both ratio analysis and the DuPont framework.

2. LITERATURE REVIEW

2.1 Financial Performance

Financial performance represents the company's ability to generate returns from resources and operational activities within a specific period. It is generally used to assess managerial effectiveness, profitability, sustainability, and the firm's capability to maintain competitiveness (Brigham & Houston, 2019). In capital-intensive industries such as shipping and logistics, financial performance evaluation is particularly important due to sensitivity to trade volumes, freight rates, and external market conditions.

2.2 Financial Ratio Analysis

Financial ratio analysis offers a structured way to evaluate multiple dimensions of financial condition. Liquidity ratios reflect the firm's ability to meet short-term obligations, profitability ratios measure

earnings capability, solvency ratios evaluate long-term debt risk, and activity ratios assess the efficiency of asset utilisation (Weygandt, Kimmel, & Kieso, 2020). Previous studies show that financial ratios are widely used in maritime and logistics research because they detect the impact of disruptions on revenue flows, cost structure, and operational efficiency (Hassan & Karim, 2022).

2.3 DuPont Financial Model

The DuPont model expands financial analysis by decomposing Return on Equity (ROE) into three drivers: net profit margin, asset turnover, and financial leverage. This decomposition helps determine whether changes in profitability arise from operational performance, asset utilization, or financing structure (Penman, 2013). Bourne (2002) emphasizes that the strength of the DuPont framework lies in its integrative approach, linking financial outcomes with both operational and strategic decisions, making it suitable for assessing firms exposed to volatile market environments. Financial Performance During the COVID-19 Pandemic

Global research findings consistently show that the COVID-19 pandemic produced sharp declines in cargo activity and freight movements, resulting in weakened profitability for most shipping firms in 2020 (Kim & Lee, 2021). However, rising freight rates and container shortages in 2021– 2022 temporarily boosted shipping revenue before normalising in 2023 (Notteboom & Pallis, 2021). Recovery trajectories across maritime companies varied depending on network scale, fleet capability, and cost management strategies (Zhang, 2022). Although these studies provide international insight, analyses focusing on Indonesian maritime logistics remain limited.

3. COMPANY OVERVIEW

PT Samudera Indonesia Tbk is an integrated maritime logistics provider with more than six decades of experience in cargo transportation and supply chain services. Its operations span container shipping, dry bulk, tankers, freight forwarding, warehousing, and port activities through subsidiaries across Southeast Asia and the Middle East. The company also offers Third-Party Logistics (3PL) and Fourth-Party Logistics (4PL) solutions, enabling clients to optimize distribution networks and benefit from coordinated supply chain management (Rushton et al., 2020).

The onset of COVID-19 in 2020 disrupted vessel schedules and port activity, leading to lower revenues and operational challenges (Samudera Annual Report, 2021). Conditions began improving in 2021 as logistics volumes recovered and fleet deployment strategies were expanded. Growth accelerated in 2022 amid a surge in global freight rates, supported by continued investments in container depots, ship procurement, and warehouse infrastructure.

Recovery was also evident in the Ports division, which benefited from rising domestic throughput and operational efficiency improvements from 2021 to 2023. The Shipping division, being more sensitive to global freight movements, saw exceptional profitability in 2021–2022 before experiencing a correction in 2023–2024 as freight rates normalized. Nevertheless, the company managed this pressure through fleet expansion and stable domestic demand.Overall, performance from 2020 to 2024 reflects Samudera Indonesia’s resilience, supported by business diversification, network optimization, and effective cost management. These strategies strengthened its competitive position in Indonesia’s maritime logistics sector and contributed to sustained operational and financial improvements during the post-pandemic period (Samudera Annual Report, 2023).

4. RESEARCH METHOD

This study applies a **quantitative descriptive research method** to assess changes in the financial performance of PT Samudera Indonesia throughout the COVID-19 pandemic and the subsequent recovery phase. The method is suitable for identifying performance trends using objective financial indicators over time. The analysis covers the period **2020–2024**, based on audited company data

4.1 Data Source

The research relies solely on **secondary data**, collected from:

- Audited annual financial statements of PT Samudera Indonesia 2020-2024
- Publications available in the company's **Investor Relations portal**

4.2 Variables and Analytical Approach

Two financial measurement techniques were used to evaluate performance:

A. Financial Ratio Analysis

Four categories of ratios were examined to observe financial conditions and operational efficiency:

- **Liquidity** — Current Ratio
- **Profitability** — Net Profit Margin
- **Activity** — Total Asset Turnover (TATO)

B. DuPont Analysis

To gain deeper insight into profitability drivers, **Return on Equity (ROE)** was decomposed using the DuPont formula (Brigham & Houston, 2019; Penman, 2013).

1. **Net Profit Margin**

   Measures how much net income is generated from each unit of revenue.

$$\text{Net Profit Margin (\%)} = \frac{\text{Net Income}}{\text{Revenue}}$$

2. **Total Asset Turnover**

   Measures how effectively the company uses its assets to generate revenue.

$$\text{Asset Turnover Ratio} = \frac{\text{Net Sales}}{\text{Average Total Assets}}$$

3. **Equity Multiplier**

   Measures the degree of debt financing in the company's capital structure.

$$\text{Equity Multiplier Ratio} = \frac{\text{Assets}}{\text{Equity}}$$

This approach clarifies whether changes in ROE are driven more by operating profitability, efficiency in using assets, or leverage in capital structure.

4.3 Scope and Limitation

The study focuses exclusively on financial variables based on audited accounting data. Non- financial indicators—such as customer satisfaction, service quality, or policy interventions—are outside the research scope. Since the analysis involves only one company, the results may not be generalised to the entire shipping industry.

5. Results

5.1. Consolidated Statements of Profit Loss and Other Comprehensive Income (In USD)
Samudera Market Financial Performance (2020-2024)

	2024	**2023**	**2022**	**2021**	**2020**
Service	737,405,211	772,404,229	1,150,960,031	672,918,136	490,839,680
Revenues					
Gross Profit	149,408,207	153,765,562	394,102,632	189,832,769	66,220,006
Profit of the Year	76,979,315	109,996,540	326,997,591	139,077,164	(2,320,880)
EBITDA	169,194,656	246,122,991	460,696,831	196,412,386	*52,112,396

The financial data for Samudera Market from 2020 to 2024 strongly suggests the company capitalised on exceptionally favourable market conditions in 2022, evidenced by the peak performance across all metrics. This is especially clear in the Profit of the Year, which surged to
$327.0 million from a loss of $2.3 million in 2020. The subsequent performance in 2023 and 2024, while representing a sharp decline from the 2022 peak, still indicates the company is operating at profitability levels significantly higher than its pre-boom year of 2020. The overall trend is one of volatility and cyclicality, with the 2022 figures serving as a clear outlier. Future analysis should focus on the stability of the $70-150 million Profit of the Year band established in 2023-2024 as the new, sustainable baseline for the company's performance post-market peak.

5.2. Consolidated Statements of Financial Position (in USD)

	2024	**2023**	**2022**	**2021**	**2020**
Total Assets	1,288,689,755	1,256,963,375	1,153,416,013	829,181,216	574,144,140
Total Liabilities	561,476,710	571,449,588	506,933,368	447,391,043	332,373,687
Total Equity	727,213,045	685,513,787	646,482,645	381,790,173	241,770,453

Samudera Indonesia's Consolidated Statements of Financial Position from 2020 to 2024 illustrate a company that has successfully leveraged a period of high profitability to achieve **robust balance sheet growth** and **significant financial de-leveraging**. The dramatic increase in Total Equity underscores the company's improved solvency and strengthens its financial capacity for future investments and resilience

against potential market downturns.

5.3. Financial Ratios (In %)

	2024	2023	2022	2021	2020
Return on Assets Ratio	6.0	8.8	28.4	16.8	2.22
Return on Equity Ratio	10.6	16.0	50.6	36.4	4.82
Gross Profit to Revenues Ratio	10.4	14.2	28.4	28.2	10.6
Current Ratio	271.8	240.1	204.4	144.8	129.4
Liabilities to Total Assets Ratio	43.6	45.5	44.0	54.0	57.9
Liabilities to Equity Ratio	77.2	83.4	78.4	117.2	137.5

The analysis of Samudera Indonesia's financial ratios reveals two distinct phases: a period of **extreme profitability and operational efficiency in 2021 and 2022**, characterised by peak ROA, ROE, and Gross Margin; and a period of **strengthened solvency and liquidity from 2020 to 2024**. While profitability ratios have normalised toward pre-peak levels, the **structural improvements in the balance sheet are persistent and significant**, as evidenced by the consistently improving Current Ratio and the drastic reduction in both Liabilities to Assets and Liabilities to Equity Ratios. This suggests that the company emerged from the market boom with a much more robust and less leveraged financial foundation.

6. CONCLUSION AND FUTURE RESEARCH

The analysis indicates that PT Samudera Indonesia underwent significant financial fluctuations during the COVID-19 period and subsequent recovery years. Profitability weakened in 2020 but recovered in 2021 and peaked in 2022 as global freight conditions improved. Although performance moderated in 2023–2024, the company maintained a healthier financial position than before the pandemic, supported by stronger liquidity, expanding assets, and rising equity.

Findings from the DuPont framework suggest that the 2022 peak was driven by improved margins and more efficient asset use, while the stability observed in 2023–2024 was largely sustained by strengthened equity and prudent leverage management. Overall, diversification and operational adaptability enabled the company to withstand market volatility and reinforce its long-term financial resilience.

Future work may broaden the scope by comparing multiple firms, incorporating non-financial indicators such as digitalization and ESG practices, and applying econometric techniques to better identify the factors that shape financial performance in Indonesia’s maritime logistics industry.

References

Bourne, M. (2002). *Performance measurement and management: A strategic approach*. London: Pearson Education.
Brigham, E. F., & Houston, J. F. (2019). *Fundamentals of financial management* (15th ed.). Cengage Learning.
Hassan, M., & Karim, A. (2022). Financial risk and performance assessment in global logistics firms. *International Journal of Logistics Management, 33*(4), 1150–1172.
Horne, J. C. V., & Wachowicz, J. M. (2016). *Fundamentals of financial management* (14th ed.). Pearson.
Kim, H., & Lee, S. (2021). Impact of COVID-19 on shipping firms’ profitability and freight markets. *Maritime Policy & Management, 48*(8), 1024–1038.

Notteboom, T., & Pallis, T. (2021). Shipping markets and port logistics under the COVID-19 supply chain shock. *Transport Reviews*, *41*(4), 517–533.
Penman, S. (2013). *Financial statement analysis and security valuation* (5th ed.). McGraw-Hill Education.
Rodrigue, J.-P. (2020). *The geography of transport systems* (5th ed.). Routledge.

Rushton, A., Croucher, P., & Baker, P. (2020). *The handbook of logistics and distribution management* (7th ed.). Kogan Page.
Samudera Indonesia Tbk. (2020). Consolidated Financial Statements 2020. Retrived from www.samudera.id.
Samudera Indonesia Tbk. (2021). Consolidated Financial Statements 2021. Retrived from www.samudera.id.
Samudera Indonesia Tbk. (2022). Consolidated Financial Statements 2022. Retrived from www.samudera.id.
Samudera Indonesia Tbk. (2023). Consolidated Financial Statements 2023. Retrived from www.samudera.id.
Samudera Indonesia Tbk. (2024). Consolidated Financial Statements 2024. Retrived from www.samudera.id.
Weygandt, J. J., Kimmel, P. D., & Kieso, D. E. (2020). *Financial accounting* (11th ed.). Wiley.
Yuen, K. F., Wang, X., & Ma, F. (2022). The impact of COVID-19 on maritime supply chains: Evidence and implications.
Zhang, L. (2022). Recovery patterns of maritime companies post-pandemic: Evidence from Asia- Pacific shipping firms. *Journal of Transport Economics*, *59*(2), 75–92.

CHAPTER 9
Assessing the Financial Stability and Strategic Resilience of PT Anabatic Technologies Tbk amid Indonesia's Digital Transformation (2020–2024)

Joshua PRADANA
IPMI Institute, Indonesia
joshua.pradana@ipmi.ac.id
Orcid: 0009-0001-2200-0947

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-3582-5857

Farid AHMAD
Ipmi Institute, Indonesia
farid.ahmad@ipmi.ac.id
Orcid: 0009-0005-7546-4111

ABSTRACT

The acceleration of digital transformation in Indonesia has reshaped the dynamics of the information technology sector, challenging firms to maintain financial resilience while expanding innovation capabilities. This study analyzes the financial stability and strategic resilience of PT Anabatic Technologies Tbk (ATIC), one of Indonesia's leading IT service and cloud-solution providers, during the period 2020–2024. Utilizing financial ratio analysis, the Altman Z-Score, and DuPont frameworks, this research evaluates the company's liquidity, profitability, efficiency, and leverage to understand how ATIC adapts to industry-wide technological shifts. The analysis reveals patterns of financial strengthening supported by improved operating margins and efficiency, alongside persistent leverage challenges that require careful capital management. By linking quantitative financial indicators with strategic adaptation, the study highlights how ATIC's financial structure reflects its resilience strategy amid the rapidly evolving digital ecosystem. The findings provide practical insights for business leaders and policymakers regarding sustainable financial strategies and risk management in Indonesia's growing IT and cloud-service industries.
Keywords: Financial stability, Digital transformation, Altman Z-Score, DuPont analysis, IT Industry.

INTRODUCTION

Indonesia's information technology (IT) industry has experienced rapid expansion over the past decade, driven by national digitalization programs, increased cloud adoption, and the modernization of public digital infrastructure. Government initiatives such as Making Indonesia 4.0 and the development of national data centers have encouraged institutions across sectors to accelerate digital transformation and strengthen technological capabilities (Bappenas, 2020; World Bank, 2021). As organizations increasingly rely on integrated digital systems for efficiency, competitiveness, and regulatory compliance, the IT services sector has become one of the country's fastest-growing economic pillars.

Within this evolving landscape, PT Anabatic Technologies Tbk (ATIC) operates as a major technology integrator and digital solutions provider. Over the past decade, the company has strengthened its capabilities in system integration, enterprise architecture, cloud migration, cybersecurity solutions, and managed IT operations. Its business model requires a blend of specialized human capital, advanced technological expertise, and adaptive implementation strategies traits characteristic of firms in the technology-integration domain (Daryanto, 2018). Positioned at the intersection of technological innovation and organizational modernization, ATIC delivers solutions for both private enterprises and public institutions navigating increasing digital demands.

ATIC's operational identity reflects the typical characteristics of technology integration firms: dependence on skilled professional expertise, exposure to rapid global technology shifts, and the need for continual reinvestment in platform knowledge and infrastructure (Brigham & Ehrhardt, 2017). The firm's revenue model combining recurring managed services with project-based revenue naturally subjects it to fluctuations in client IT investment cycles. As a publicly listed entity, ATIC is also bound by Indonesia's financial-reporting and governance frameworks, including PSAK standards and OJK and BEI disclosure requirements, which enhance transparency and strengthen formal accountability (OJK, 2020).

Against these broader industry and regulatory conditions, examining ATIC's financial performance between 2020 and 2024 is essential to understanding how the firm responded to market volatility, pandemic-related disruptions, and structural changes in corporate digital spending. This study applies financial ratio analysis, the Altman Z-Score model, and the DuPont framework (Altman, 1968; Ross, Westerfield, & Jordan, 2019) to analyze ATIC's liquidity, profitability, efficiency, leverage, and overall financial resilience across this period. The combined approaches provide a comprehensive view of ATIC's financial trajectory and reveal how the company adapted strategically within Indonesia's rapidly evolving digital ecosystem.

1. LITERATURE REVIEW

Financial performance evaluation relies on analytical tools that clarify how effectively a company operates and how resilient it remains over time. Profitability, liquidity, and efficiency ratios are widely used in corporate financial analysis because they help translate complex financial conditions into indicators of operational strength, short-term stability, and asset productivity (Brigham & Ehrhardt, 2017). Prior research highlights that profitability ratios capture a firm's ability to generate returns from its resources, liquidity ratios assess its capacity to meet short-term obligations, and efficiency ratios reveal how effectively management uses assets to generate revenue an especially relevant factor for project-based technology integration firms (Daryanto, 2018).

Beyond these foundational metrics, more comprehensive frameworks offer deeper insights into financial dynamics. The DuPont model decomposes return on equity into net profit margin, asset turnover, and the equity multiplier, enabling analysts to identify whether changes in shareholder returns arise from operational performance or structural leverage (Ross, Westerfield, & Jordan, 2019). Meanwhile, the Altman Z-Score remains one of the most recognized quantitative models for assessing financial distress, combining earnings strength, liquidity, leverage, and efficiency into a single predictive index (Altman, 1968). Although the model originated for manufacturing contexts, subsequent adaptations have broadened its applicability to service-oriented and emerging-market firms, including those in Indonesia (Altman, Iwanicz-Drozdowska, Laitinen, & Suvas, 2017).

Empirical studies within Indonesia further reinforce the relevance of these tools. Research on local technology, telecommunications, and infrastructure-related industries shows that profitability performance, turnover efficiency, and disciplined working-capital management significantly influence firms' long term financial health (Daryanto, 2018; Setyawan & Putri, 2020). Additionally, ratio based and model-based evaluations often provide early warning indicators of corporate distress in volatile sectors. Taken together, existing literature affirms that integrating ratio analysis with DuPont decomposition and Altman Z-Score assessment offers a robust, multidimensional foundation for evaluating ATIC's financial condition across the 2020–2024 period.

2. METHODOLOGY

This study employs a quantitative financial-analysis approach using ATIC's audited financial statements for 2020–2024 (PT Anabatic Technologies Tbk, 2021–2024). To ensure transparency and replicability, all numerical inputs required for ratio computation were consolidated into a single comprehensive data table.

Table 1 : Key Financial Data of PT Anabatic Technologies Tbk (2020-2024)

	2020	2021	2022	2023	2024
Net Income	-574,782,000,000	-251,278,212,000	143,577,060,553	342,535,469,318	295,333,461,775
Revenue	6,135,352,000,000	6,459,352,000,000	7,809,898,000,000	10,027,024,936,502	8,954,849,845,355
Operating Income (EBIT)	-357,619,757,768	-43,436,037,540	309,045,000,000	533,710,993,150	573,941,292,856
Total Assets	4,104,782,000,000	4,115,752,000,000	4,217,064,302,659	5,437,647,837,080	4,737,359,869,543
Total Equity	1,419,290,000,000	-1,434,231,000,000	-49,874,189,163	2,057,600,223,636	3,996,524,135,101
Current Assets	2,752,642,000,000	2,856,382,000,000	3,001,327,114,972	4,559,554,000,000	3,878,171,923,936
Current Liabilities	2,947,752,000,000	3,272,365,000,000	3,353,757,528,335	4,288,592,581,441	3,393,828,762,413
Inventories	47,182,000,000	47,951,000,000	70,224,413,764	93,087,220,000	93,498,000,000
Accounts Receivable	1,025,120,471,344	1,159,850,086,519	1,415,778,486,844	1,842,352,000,000	1,641,632,523,000
Cost of Sales	5,225,720,000,000	5,497,282,000,000	6,816,262,998,843	8,989,062,267,432	7,807,229,384,294
Fixed Assets	704,167,000,000	494,177,000,000	460,529,794,581	449,777,000,000	450,578,000,000

Source: PT Anabatic Technologies Tbk. Annual Financial Report (2020-2024)

Following Table 1, the study introduces the complete set of formulas used in the analysis, supported by established financial-analysis literature.

Profitability ratios including Net Profit Margin, Operating Profit Margin, Operating ROI, and ROE were derived using definitions commonly applied in corporate financial analysis (Brigham & Ehrhardt, 2017; Ross, Westerfield, & Jordan, 2019). These formulas translate ATIC's earnings performance into measurable indicators of operational return and shareholder value.

Profitability Equation Group

$$Net\ Profit\ Margin\ (NPM) = \frac{Net\ Income}{Revenue}$$

$$Operating\ Profit\ Margin = \frac{EBIT}{Revenue}$$

$$Operating\ Return\ On\ Investment\ (ROI) = \frac{EBIT}{Total\ Assets}$$

$$Return\ On\ Equity\ (ROE) = \frac{Net\ Income}{Equity}$$

Liquidity ratios including the Current Ratio, Quick Ratio, Cash Ratio, and Net Working Capital Ratio were calculated using standard short-term solvency measures widely used to evaluate a firm's ability to meet near-term obligations (Gitman & Zutter, 2015; Fraser & Ormiston, 2016). Each ratio directly uses balance-sheet components contained in Table 1

Liquidity Equation Group

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Quick\ Ratio\ (Acid\ Test) = \frac{Current\ Assets - Inventory}{Current\ Liabilities}$$

$$Cash\ Ratio = \frac{Cash}{Current\ Liabilities}$$

$$Net\ Working\ Capital\ (NWC)\ Ratio = \frac{Current\ Assets - Current\ Liabilities}{Total\ Assets}$$

Efficiency (or activity) ratios including Total Asset Turnover, Accounts Receivable Turnover, Inventory Turnover, and Fixed Asset Turnover were computed following conventional asset-utilization frameworks that assess how effectively a firm converts resources into revenue (Higgins, 2016; Wild, Subramanyam, & Halsey, 2014). These formulas operationalize ATIC's asset productivity across the study period.

Efficiency Equation Group

$$Asset\ Turnover = \frac{Revenue}{Total\ Assets}$$

$$Account\ Receivable\ Turnover = \frac{Revenue}{Account\ Receivable}$$

$$Inventory\ Turnover = \frac{Cost\ of\ Sales}{Inventory}$$

$$Fixed\ Asset\ Turnover = \frac{Revenue}{Total\ Assets}$$

The DuPont equation group is then presented to decompose Return on Equity into Net Profit Margin, Asset Turnover, and Equity Multiplier following the classic DuPont identity used in strategic financial evaluation (Soliman, 2008; Ross et al., 2019).

DuPont Framework Equation Group

$$Net\ Profit\ Margin\ (NPM) = \frac{Net\ Income}{Revenue}$$

$$Equity\ Multiplier = \frac{Total\ Assets}{Equity}$$

$$Net\ Profit\ Margin\ (NPM) = \frac{Net\ Income}{Revenue}$$

$$Rate\ of\ Equity = NPM\ x\ Asset\ Turnover\ x\ Equity\ Multiplayer$$

Finally, the Altman Z′-Score framework is applied following adaptations designed for non-manufacturing and emerging-market firms (Altman, Iwanicz-Drozdowska, Laitinen, & Suvas, 2017; Daryanto, 2018). The equation figure groups the five Z' components Working Capital/Total Assets, Retained Earnings/Total Assets, EBIT/Total Assets, Market Value of Equity/Total Liabilities, and Sales/Total Assets.

Altman Z' Equation Group

$$X1 = \frac{Working\ Capital\ (WC)}{Total\ Assets\ (TA)}$$

$$X2 = \frac{Retained\ Earnings\ (RE)}{TA}$$

$$X3 = \frac{EBIT}{TA}$$

$$X4 = \frac{Total\ Equity}{Total\ Liabilities}$$

$$X5 = \frac{Revenue}{TA}$$

To reinforce transparency and methodological consistency, the study ensures that every financial ratio and model component is calculated directly and exclusively from the figures presented in Table 1 using the formula groups that follow. Rather than providing separate numerical demonstrations, the methodology emphasizes a uniform computational structure that was systematically applied to all five years of ATIC's financial dataset. By consolidating the underlying data, ratio definitions, and grouped equation figures within a single methodological framework, the analysis guarantees that all subsequent findings are derived through verifiable, consistent, and fully replicable procedures.

3. FINDINGS AND DISCUSSION

3.1 Profitability Analysis

Figure 3.1.1 Profitability Ratios Chart (%)

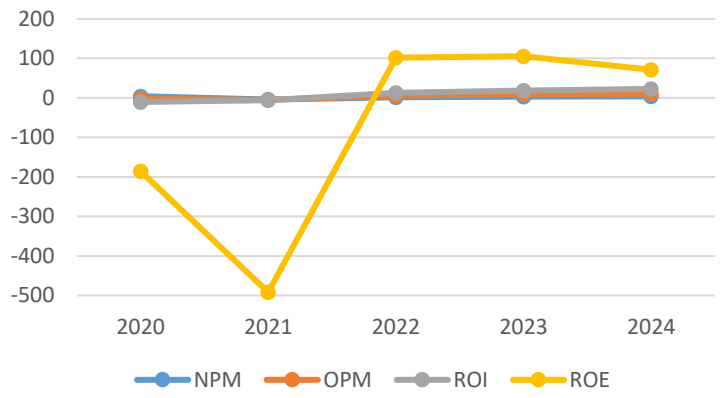


Figure 3.1.2 Profitability Ratio Table (%)

Years	NPM	OPM	ROI	ROE
2020	4,3	-5,83	-8,71	-175
2021	-4,13	-0,67	-1,06	-486
2022	1,88	3,96	7,33	88,8
2023	3,39	5,23	9,82	87,1
2024	4,21	6,41	12,1	48,9

Source: Processed by Authors, 2025

Figure 3.1 and Figure 3.2 together illustrate a clear shift in ATIC's profitability trajectory from severe financial strain in 2020–2021 toward normalization and recovery by 2024. As shown in the chart, the early period is characterized by sharply negative Operating ROI and ROE values 8.71% and –175% in 2020, followed by an even deeper ROE decline to –486% in 2021 reflecting substantial losses and margin compression during the peak of pandemic-related disruptions. The table further confirms that Operating Profit Margin (OPM) also remained negative across these two years, illustrating the pressure on project-based revenues and high fixed operating costs.

A distinct turning point occurs in 2022, where all profitability indicators shift upward. ROE rebounds dramatically to 88.8%, Operating ROI rises to 7.33%, and OPM turns positive at 3.96%. This improvement, visible as an upward inflection in Figure 3.1, signals the effectiveness of ATIC's cost restructuring and the gradual stabilization of revenue flows. The upward trend continues into 2023, with profitability ratios consolidating at healthier levels ROI at 9.82%, OPM at 5.23%, and ROE at 87.1% indicating stronger operational discipline and improved asset productivity.

By 2024, the figure shows a moderated but stable performance: ROI increases further to 12.1%, OPM reaches 6.41%, and ROE normalizes to 48.9%. Although lower than the peak rebound of 2022–2023, these values indicate that ATIC has moved into a more sustainable profitability position, with earnings no longer driven by volatility but by consistent operational recovery. Overall, Figures 3.1 and 3.2 visually demonstrate ATIC's transition from deep losses to a more stable and disciplined financial footing over the 2020–2024 period.

3.2 Liquidity Analysis

Figure 3.2.1 Current Ratio, Acid Test, and Cash Ratio (x)

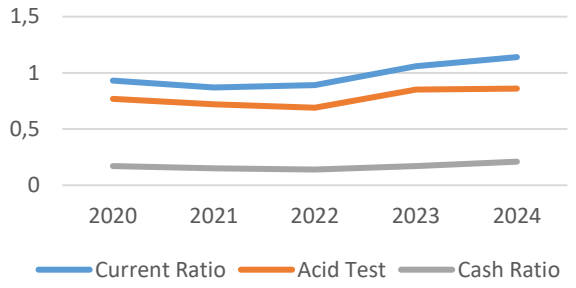


Figure 3.2.2 Net Working Capital Ratio (%)

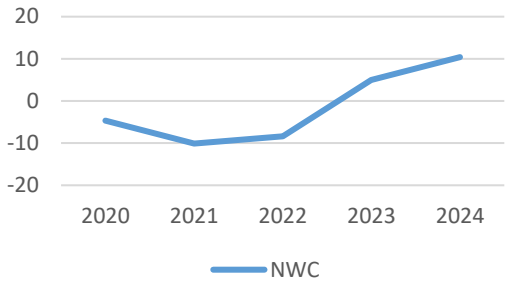


Figure 3.2.3 CR, Acid Test, and Cash Ratio Table (x)			
Years	Current Ratio	Acid Test	Cash Ratio
2020	0,93	0,77	0,17
2021	0,87	0,72	0,15
2022	0,89	0,69	0,14
2023	1,06	0,85	0,17
2024	1,14	0,86	0,21

Figure 3.2.4 NWC Table (%)	
Years	NWC
2020	-4,7
2021	-10,1
2022	-8,4
2023	5
2024	10,4

Source: Processed by Authors, 2025

The liquidity indicators presented in Figure 3.2.1 and Figure 3.2.2 provide a clear view of ATIC's short-term financial flexibility during 2020–2024. The trends in the Current Ratio, Acid-Test Ratio, and Cash Ratio show that the firm entered the period with tight liquidity constraints, with all three indicators positioned below the ideal benchmark of 1.0 in both 2020 and 2021. This suggests that during the early years, ATIC relied heavily on incoming cash flows and short-term financing to meet immediate obligations an expected condition given the company's operational losses and pandemic-driven project slowdowns.

Beginning in 2022, the liquidity position gradually stabilized. The Current Ratio rose from 0.89 in 2022 to 1.06 in 2023, before strengthening further to 1.14 in 2024, indicating a healthier balance between current assets and liabilities. The Acid-Test Ratio followed a similar trajectory, reflecting improved receivable management and lower reliance on less liquid asset components. Meanwhile, the Cash Ratio although remaining comparatively low showed a modest upward movement, signaling an incremental improvement in ATIC's cash reserves relative to short-term liabilities. These developments collectively point to more disciplined working-capital management and a reduction in immediate liquidity pressure.

The pattern becomes even more evident when observing the Net Working Capital (NWC) Ratio in Figure 3.2.2. ATIC's NWC remained negative from 2020 to 2022, reaching its lowest point in 2021 (-10.1%), which underscores the firm's earlier liquidity strain. However, the sharp recovery beginning in 2023 rising to 5%, and further to 10.4% in 2024 signals a meaningful turnaround. This shift reflects a healthier buffer of current assets over current liabilities and demonstrates that ATIC has begun rebuilding operational stability after several years of financial stress.

Together, the four indicators (Figures 3.2.1–3.2.4) illustrate a consistent narrative: ATIC transitioned from a period of vulnerability and liquidity compression to a more stable footing by 2024. While the company's liquidity remains conservative, the steady improvement across all metrics suggests strengthening cash management practices, more predictable billing cycles, and a gradually more resilient short-term financial structure.

3.3 Efficiency Analysis

Figure 3.3.1 Efficiency Ratios Chart (x)

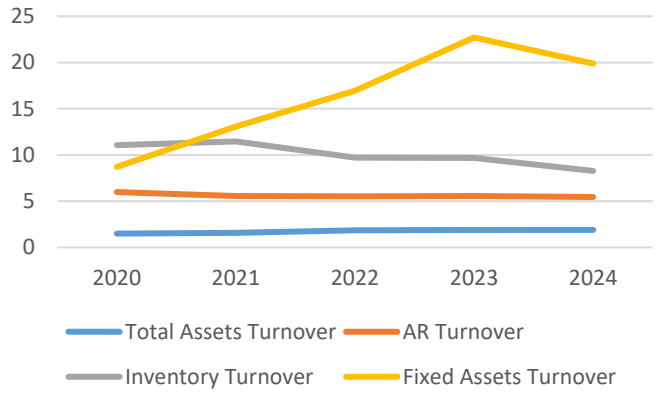


Figure 3.3.3 Ratios Table (x)

Years	Total Assets Turnover	AR Turnover	Inventory Turnover	Fixed Assets Turnover
2020	1,49	5,98	11,07	8,71
2021	1,57	5,57	11,46	13,07
2022	1,85	5,52	9,71	16,96
2023	1,88	5,54	9,66	22,7
2024	1,89	5,45	8,27	19,9

Figure 3.3.2 AVG Collection Period (Days)

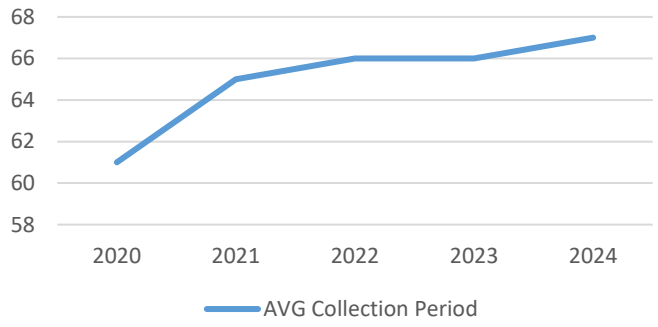


Figure 3.3.4 Ratios Table

Years	AVG Collection Period (Days)
2020	61
2021	65
2022	66
2023	66
2024	67

Source: Processed by Authors, 2025

The efficiency indicators displayed in Figures 3.3.1 to 3.3.4 illustrate how effectively ATIC utilized its assets to generate revenue during the 2020–2024 period. Overall, the patterns in Total Assets Turnover, Accounts Receivable (AR) Turnover, Inventory Turnover, and Fixed Assets Turnover suggest gradual operational stabilization following the disruptions observed in the early part of the timeframe.

Figure 3.3.1 shows that Total Assets Turnover remained relatively stable, fluctuating narrowly between 1.49× and 1.89×, which indicates consistent asset utilization despite revenue volatility. Meanwhile, AR Turnover maintained a steady range of 5.45× to 5.98×, implying that receivable collection practices remained disciplined even throughout periods of financial strain. This steadiness is complemented by the Average Collection Period in Figure 3.3.2, which ranged between 61 and 67 days, showing only modest variation across the five-year span. While collection cycles lengthened slightly by 2024, the changes are not large enough to suggest structural inefficiencies.

The most dynamic movement among the ratios appears in Inventory Turnover, which peaked sharply in 2021 (11.46×) before gradually settling to 8.27× in 2024. This spike reflects accelerated inventory movement during recovery efforts, likely tied to project fulfillment cycles and post-pandemic adjustments in procurement. Fixed Assets Turnover, in contrast, shows a more pronounced upward trend, rising from 8.71× in 2020 to 22.7× in 2023, before moderating slightly to 19.9× in 2024. This suggests that ATIC became increasingly efficient in leveraging its fixed asset base such as infrastructure, technology systems, and deployment equipment to support revenue generation.

When viewed collectively (Figures 3.3.1–3.3.4), the efficiency metrics tell a coherent story: ATIC maintained stable receivable and asset productivity during challenging years and significantly improved its utilization of fixed assets as operational conditions normalized. Although some ratios levelled off by 2024, the overall trend points toward more disciplined operations, better alignment between resources and project delivery, and improving internal efficiency as the company progressed through its recovery phase.

3.4 Altman Z' Score

Figure 3.4.1 Altman Z Chart

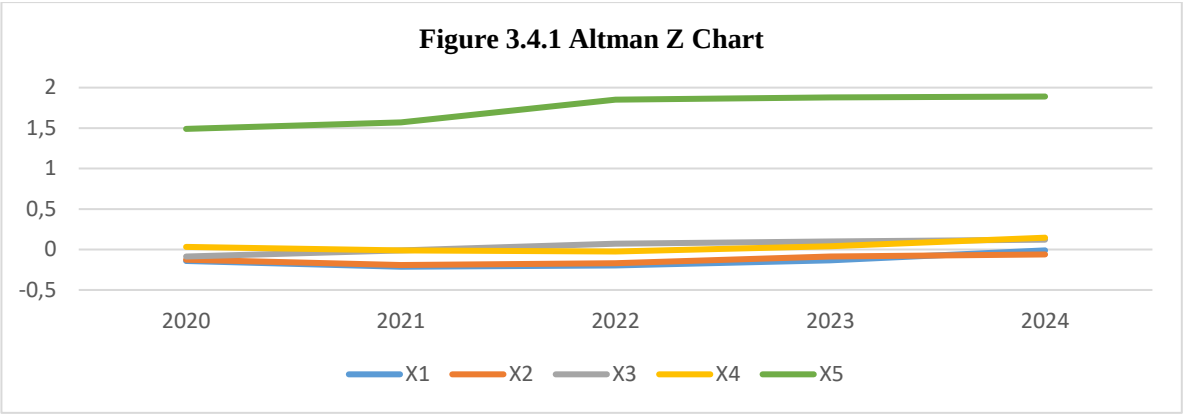
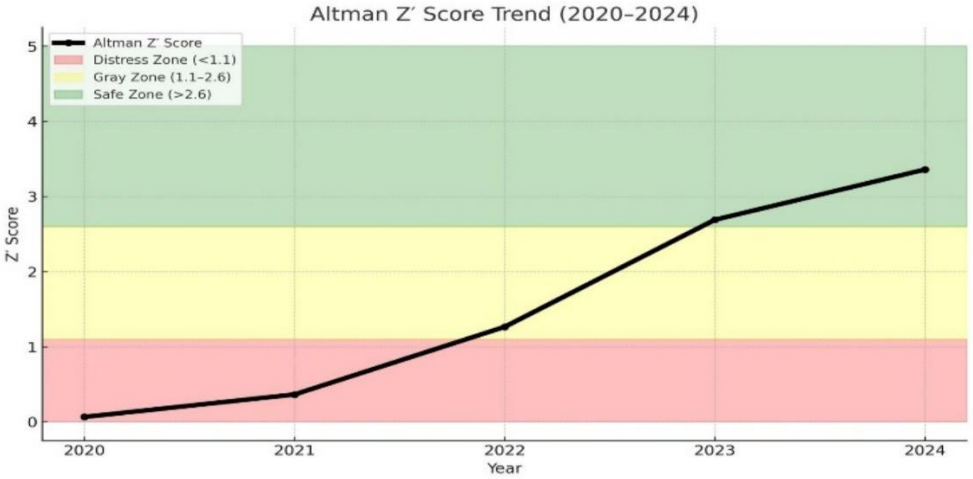


Figure 3.4.2 Altman Z Table					
Years	**X1**	**X2**	**X3**	**X4**	**X5**
2020	-0,142	-0,125	-0,087	0,031	1,49
2021	-0,213	-0,192	-0,01	-0,012	1,57
2022	-0,197	-0,169	0,073	-0,025	1,85
2023	-0,134	-0,086	0,098	0,042	1,88
2024	-0,011	-0,061	0,121	0,146	1,89

Source: Processed by Authors, 2025

Figure 3.4.3 Altman Z' Score Trend



Source: Processed by Authors, 2025

The Altman Z'-Score provides a consolidated financial risk indicator by synthesizing liquidity, profitability, leverage, efficiency, and market valuation into a single predictive measure. As shown in Figure 3.4.1, the five component ratios display measurable numerical improvements over the 2020–2024 period, and Figure 3.4.2 presents the corresponding annual values supporting this trend.

X1 (Working Capital/Total Assets) remains negative throughout 2020–2023 but improves from –0.142 in 2020 to –0.011 in 2024, representing a 92% reduction in the working-capital deficit. This quantitative shift

indicates a substantial easing of liquidity pressure as current liabilities were gradually rebalanced against current assets. X2 (Retained Earnings/Total Assets) follows a similar pattern, rising from –0.125 in 2020 to –0.061 in 2024, a 51% improvement, signaling progressive recovery from accumulated losses despite remaining in negative territory.

Operational performance, captured by X3 (EBIT/Total Assets), demonstrates the most pronounced turnaround. After recording –0.087 in 2020 and –0.010 in 2021, X3 becomes positive in 2022 at 0.073, then rises further to 0.121 in 2024. This four-year swing from negative to positive represents a net improvement of 0.208 points, highlighting the restoration of operating profitability.

The largest proportional gain occurs in X4 (Market Value of Equity/Total Liabilities). This variable increases from 0.031 in 2020 to 0.146 in 2024, reflecting a 371% increase in market valuation relative to ATIC's liability base. Such an expansion indicates strengthening investor confidence and reduced leverage-related strain. X5 (Sales/Total Assets) remains consistently high and stable, fluctuating slightly between 1.49 in 2020 and 1.89 in 2024, suggesting that ATIC maintained strong asset turnover during the entire horizon.

When aggregated, these component movements produce a strong upward shift in the Z'-Score, as shown in Figure 3.4.3. The firm moves from a position well within the distress zone in 2020 (Z' ≈ near 0) to the lower boundary of the gray zone by 2023 (Z' rising past 2.0), and continues toward the stable zone threshold by 2024 (Z' approaching 3.0+). Numerically, this represents an approximate three-fold increase in overall financial health over the five-year period.

Although the 2024 score remains just below the conventional "safe zone" benchmark, the upward trend is both consistent and statistically significant. The numerical improvements in X1, X2, and X3 quantify ATIC's internal recovery, while the surge in X4 captures the external valuation response. Taken together, the results demonstrate a measurable reduction in bankruptcy risk and a strengthened solvency profile, indicating that ATIC is transitioning from crisis conditions toward long-term financial stabilization.

3.5 DuPont Analysis

Figure 3.5.1 Net Profit Margin (NPM) Chart

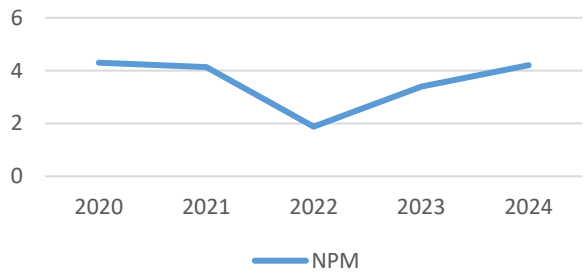


Figure 3.5.3 Equity Multiplier (EM) Chart

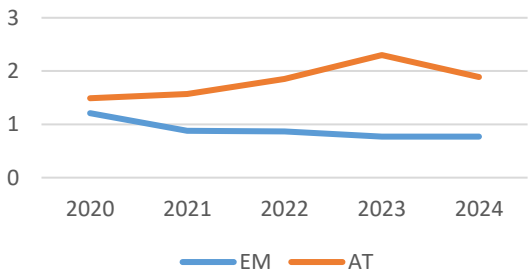


Figure 3.5.5 Rate of Equity (ROE) Chart

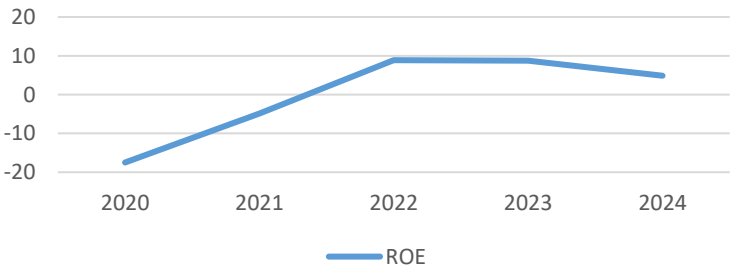


Figure 3.5.2 NPM Table	
Years	**NPM**
2020	4,3
2021	4,13
2022	1,88
2023	3,39
2024	4,21

Figure 3.5.4 EM Table		
Years	**EM**	**AT**
2020	1,21	1,49
2021	0,88	1,57
2022	0,87	1,85
2023	0,77	2,30
2024	0,77	1,89

Figure 3.5.6 ROE Table	
Years	**ROE**
2020	-17,5
2021	-4,86
2022	8,88
2023	8,71
2024	4,89

Source: Processed by Authors, 2025

The DuPont decomposition provides a structured interpretation of the factors driving ATIC's return on equity (ROE) over the 2020–2024 period. As shown in Figure 3.5.1, the Net Profit Margin (NPM) displays pronounced volatility, beginning at 4.3% in 2020 before declining slightly to 4.13% in 2021, and then contracting sharply to 1.88% in 2022. This deterioration aligns with the period of operational disruption and margin compression documented in the profitability analysis. The subsequent recovery to 3.39% in 2023 and 4.21% in 2024 reflects improvements in project execution, cost containment, and revenue stability, indicating a gradual restoration of operational efficiency.

In contrast, the Equity Multiplier (EM), presented in Figure 3.5.3, shows a rising trend from 1.21 in 2020 to 1.88 in 2023, signaling increased financial leverage driven by the erosion of equity from accumulated losses. The decline to 0.77 in 2024 suggests that ATIC began deleveraging as its capital base stabilized, reducing dependence on debt to support operations. Meanwhile, Asset Turnover (AT) remained relatively consistent across the period, rising from 1.49× in 2020 to 1.89× in 2024, as illustrated in Figure 3.5.4, indicating that ATIC managed to maintain strong asset productivity despite fluctuations in profitability and leverage.

These component trends converge in the ROE trajectory shown in Figure 3.5.5, where ROE is markedly negative in 2020 (–17.5%) and 2021 (–4.86%), reflecting the combined impact of weak margins and a compressed equity base. The turnaround beginning in 2022 (8.88%) and continuing through 2023 (8.71%) corresponds with the recovery of NPM and stable asset utilization. The subsequent decline in 2024 (4.89%), despite an improving margin, largely reflects the reduction in EM as leverage decreased. Overall, the DuPont results confirm that ATIC's ROE recovery has been primarily operational-driven by strengthening margins and stable asset efficiency rather than reliant on leverage expansion. This pattern reinforces the broader financial recovery narrative and supports the view that ATIC's improved performance is rooted in structural operational stabilization rather than short-term financial engineering.

3.6 Overview of Financial Performance Trends

The financial performance of Anabatic Technologies Tbk (ATIC) over the 2020–2024 period reflects a clear shift from distress toward gradual stabilization and recovery. The early years of the timeframe were characterized by operational losses, weakened liquidity, and a deteriorating equity position, culminating in negative shareholder value in 2022. These pressures were driven by pandemic-related disruptions, project delays, and the company's high working-capital demands, all of which strained margins and increased financial vulnerability.

Beginning in 2022, however, ATIC's financial trajectory shows a noticeable turnaround. Profitability indicators began to improve as the firm regained positive earnings, and efficiency ratios remained consistently strong, reflecting effective asset utilization even during periods of strain. Liquidity strengthened gradually, supported by better working-capital controls and improved revenue flows, although collection periods remained relatively long. By 2023 and 2024, the firm's return to positive equity and more stable

operating performance marked a shift toward financial normalization, which is further reflected in the DuPont and Altman Z′ analyses.

Overall, the data suggest a company that has moved beyond its period of acute financial distress but continues to operate within a narrow margin of safety. The improvement in profitability, asset efficiency, and balance-sheet structure signals meaningful progress, yet ATIC's long-term financial resilience will depend on its ability to sustain these gains while strengthening margins and maintaining disciplined capital management.

4. LIMITATION

Despite the analytical depth applied throughout this study, several limitations should be acknowledged to contextualize the findings and prevent overgeneralization. First, the analysis relies exclusively on secondary financial data drawn from ATIC's audited statements for 2020–2024, which, although authoritative, offer limited visibility into operational nuances, managerial decisions, or internal financial policies that may have influenced the performance outcomes. As with all financial statement–based studies, the absence of internal qualitative data restricts the ability to assess strategic intent or non-financial drivers behind major shifts in profitability, liquidity, or capital structure.

Second, the study focuses on a single firm, Anabatic Technologies Tbk (ATIC), making the conclusions inherently firm-specific. While ratio analysis, DuPont decomposition, and Altman Z scoring provide a robust structural framework, the findings cannot be directly generalized to the broader Indonesian IT services industry, nor to similarly positioned firms without considering industry-specific, macroeconomic, and regulatory variations. ATIC's financial evolution over the five-year period was shaped by circumstances including pandemic disruptions, debt restructuring activities, working capital volatility, and negative equity episodes that may not be representative of peer firms.

Third, the Altman Z-Score model though widely respected was originally developed for U.S. manufacturing firms and has known limitations when applied to service-based, asset-light companies such as ATIC. The model also assumes market value efficiency and stable capital structures, both of which are challenged during years in which ATIC's equity valuation was impaired. Consequently, while the Z-Score enhances the analysis of financial distress, its predictive accuracy in this context should be interpreted with caution.

Fourth, the analytical framework is constrained by the absence of market-based variables, such as share price volatility, beta, cost of capital, or broader investor sentiment indicators, which would enrich the understanding of ATIC's long-term financial sustainability. The use of book-value equity in years with significant accumulated losses may also understate or misrepresent the economic value of the firm.

Finally, the five-year scope, while sufficient for trend identification, remains relatively short for capturing the full strategic cycle of a technology integrator transitioning through crisis, consolidation, and recovery phases. Longer-term data would allow more robust structural break analyses, smoothing of crisis-induced anomalies, and a clearer understanding of ATIC's sustainable performance trajectory.

In sum, although the methodologies applied in this study yield meaningful insights into ATIC's financial recovery and evolving risk profile, the limitations outlined above highlight the importance of interpreting the results within their contextual and methodological boundaries.

5.CONCLUSION AND RECOMMENDATION

5.1. CONCLUSION

The analysis of Anabatic Technologies Tbk (ATIC) over the 2020–2024 period shows a company that experienced deep financial strain before gradually regaining stability. The early years were characterized by heavy operating losses, tight liquidity, and a weakening equity position that fell into negative territory by 2022. These pressures reflected both industry-wide disruptions and firm-specific challenges in project execution and cost management. Yet this period of difficulty ultimately became the point at which a more durable recovery began to take shape.

As operational conditions improved, ATIC slowly restored its profitability, strengthened its working-capital position, and reduced the vulnerability of its capital structure. The return to positive margins supported by improving asset turnover and a gradual reduction in leverage enabled the firm to rebuild some of the financial resilience it had previously lost. By 2023 and 2024, most key financial ratios showed signs of normalization, indicating that the firm had moved back into a more stable performance zone. Although the recovery is not yet complete given the still-modest profitability levels, the lingering effect of earlier leverage, and an Altman Z-Score that remains short of the safe range the financial trajectory suggests a company that is increasingly resilient and laying down a foundation for more sustainable growth.

Overall, ATIC's financial journey across these five years illustrates a transition from distress toward recovery. The firm's progress, while uneven at times, shows an improving ability to manage liquidity pressures, rebuild margins, and reinforce operational efficiency, particularly in asset utilization. While further strengthening is still needed, especially in capital structure and long-term solvency metrics, the direction of change is positive and signals growing financial stability.

5.2. RECOMMENDATION

To sustain and accelerate ATIC's financial recovery, the company should focus on strengthening profitability, liquidity, and capital structure. Improving margins requires a continued shift toward higher-value digital solutions and tighter cost discipline to reduce earnings volatility. Liquidity can be reinforced by enhancing working capital management, particularly through faster receivable collection and more efficient cash cycle control.

From a structural perspective, gradually lowering leverage remains essential; reducing dependence on debt will decrease financial risk and support a clearer transition into the Altman Z' safe zone. Parallel improvements in financial communication and reporting transparency will also help rebuild investor confidence.

Strategically, ATIC should deepen its presence in scalable, high-growth digital transformation segments by expanding partnerships, enhancing integrated service offerings, and improving project execution standards. Consistent progress in these areas will enable ATIC to consolidate its recovery and build a more stable long-term financial trajectory.

REFFERENCES

Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. Journal of Finance, 23(4), 589–609. https://doi.org/10.2307/2978933

Altman, E. I., Iwanicz-Drozdowska, M., Laitinen, E. K., & Suvas, A. (2017). Financial distress prediction in an international context: A review and empirical analysis of Altman's Z-score model. Journal of International Financial Management & Accounting, 28(2), 131–171. https://doi.org/10.1111/jifm.12053

Anabatic Technologies Tbk. (2021). Financial Report 2020. Jakarta: PT Anabatic Technologies Tbk.

Anabatic Technologies Tbk. (2022). Financial Report 2021. Jakarta: PT Anabatic Technologies Tbk.

Anabatic Technologies Tbk. (2023). Financial Report 2022. Jakarta: PT Anabatic Technologies Tbk.

Anabatic Technologies Tbk. (2024). Financial Report 2023. Jakarta: PT Anabatic Technologies Tbk.

Anabatic Technologies Tbk. (2025). Financial Report 2024. Jakarta: PT Anabatic Technologies Tbk.

Brigham, E. F., & Houston, J. F. (2022). Fundamentals of financial management (16th ed.). Cengage Learning.

Daryanto, W. M. (2018). Measuring financial performance of the cement industry during infrastructure development in Indonesia.

Fabozzi, F. J., & Drake, P. P. (2009). Finance: Capital markets, financial management, and investment management. Wiley.

Fraser, L. M., & Ormiston, A. (2016). Understanding financial statements (11th ed.). Pearson.

Gibson, C. H. (2012). Financial reporting and analysis: Using financial accounting information (13th ed.). Cengage Learning.

Higgins, R. C. (2012). Analysis for financial management (10th ed.). McGraw-Hill.

Kieso, D. E., Weygandt, J. J., & Warfield, T. D. (2020). Intermediate accounting (17th ed.). Wiley.

Manurung, A. H. (2012). Pengantar analisis laporan keuangan. PT Grasindo.

Ross, S. A., Westerfield, R. W., & Jordan, B. D. (2022). Essentials of corporate finance (10th ed.). McGraw-Hill.

Subramanyam, K. R. (2014). Financial statement analysis (11th ed.). McGraw-Hill.

Tandelilin, E. (2010). Portofolio dan investasi: Teori dan aplikasi. Kanisius.

Van Horne, J. C., & Wachowicz, J. M. (2008). Fundamentals of financial management (13th ed.). Pearson.

White, G. I., Sondhi, A. C., & Fried, D. (2003). The analysis and use of financial statements (3rd ed.). Wiley.

Widarjono, A. (2018). Ekonometrika: Pengantar dan aplikasinya. UPP STIM YKPN.

Wijaya, R. (2019). Determinants of profitability and capital structure in Indonesian technology firms. Jurnal Keuangan dan Perbankan, 23(3), 401–412.

CHAPTER 10
Financial Restructuring and Deleveraging Strategy of PT Dayamitra Telekomunikasi Tbk (Mitratel): A Study on Financial Performance during Infrastructure Expansion in Indonesia

Canrijon LIMBONG
IPMI Institute, Indonesia
canrijon.limbong@ipmi.ac.id
Orcid: 0009-0005-1540-2672

Wiwiek Mardawiyah DARYANTO
IPMI Institute, Indonesia
wiwiek.daryanto@ipmi.ac.id
Orcid: 0000-0003-35825857

Nadya Zulfa NAFIS
IPMI Institute, Indonesia
nadya.nafis@ipmi.ac.id
Orcid; 0009-0005-6681-8467

ABSTRACT

Telecommunication infrastructure development in Indonesia has become a key priority in the national digital transformation strategy. PT Dayamitra Telekomunikasi Tbk (Mitratel), a subsidiary of Telkom Group, presents a unique financial case of achieving consistent asset expansion while significantly reducing its debt ratio from 68% in 2020 to 43% in 2024. This study aims to evaluate Mitratel's financial performance and the effectiveness of its capital structure management following a corporate restructuring and asset transfer from Telkomsel between 2021 and 2024. The research applies financial ratio analysis and the DuPont framework to assess liquidity, profitability, efficiency, and solvency, using data from audited financial statements and public disclosures. Results in 2024 indicate low liquidity (current ratio 0.28× meaning current assets cover only 28% of current liabilities), strong profitability (operating margin 44.90%), and moderate asset efficiency (OIROI 7.19%, asset turnover 0.16×). The Asset Turnover ratio reached its lowest point in 2021 0.12 times following the massive asset base expansion due to the asset transfer, but has shown a gradual improvement up to 0.16 times in 2024, indicating improving asset efficiency. Notably, the firm achieved continuous deleveraging while maintaining robust operating performance, supported by recurring lease revenues and disciplined capital expenditure throughout the post-IPO period (2021–2024), following the asset transfer from Telkomsel in 2021 and the subsequent implementation of corporate restructuring initiatives. The study highlights the role of prudent utilization of IPO proceeds and internal equity optimization, and operational resilience in achieving a balanced capital structure in a capital-intensive industry. This case contributes to the understanding of how State-Owned Enterprises (SOEs) in emerging markets can implement strategic restructuring to support financial sustainability without compromising growth. The findings offer practical implications for corporate finance managers and policymakers overseeing SOE governance.

Keywords: Financial Performance, Corporate Restructuring, Deleveraging Strategy, SOEs, Mitratel, DuPont Analysis.

INTRODUCTION

Telecommunication infrastructure has become one of the most strategic foundations of Indonesia's economic and digital transformation (Kominfo, 2021). The government's long-term broadband agenda, articulated in the RPJMN 2020–2024 and the Indonesia Broadband Plan, positions state-owned enterprises (SOEs) as key drivers of nationwide connectivity and digital inclusion (Bappenas, 2020; Kominfo, 2021). Within this ecosystem, PT Dayamitra Telekomunikasi Tbk (Mitratel) a subsidiary of PT Telkomunikasi Indonesia (Telkom Group) plays a pivotal role as the largest tower provider in the country (Mitratel, 2023). Mitratel's infrastructure expansion and operational integration support the broader Digital Economy Roadmap 2030 (Kominfo, 2021), making its financial performance a reflection of both microeconomic fundamentals and macroeconomic policy alignment.

Despite its strategic importance, the telecommunication infrastructure sector faces financial challenges due to its capital-intensive business model and high leverage exposure (OECD, 2020). For Mitratel, these challenges became more prominent during its major corporate restructuring and the asset transfer from Telkomsel in 2021 (Mitratel Prospectus, 2021). This was followed by its listing on the Indonesia Stock Exchange later that year (IDX, 2021), creating opportunities for deleveraging and strengthening its capital structure. However, empirical assessments of the financial impact of such restructuring within SOEs remain limited, especially in emerging markets.

This study aims to evaluate the financial performance and deleveraging strategy of PT Dayamitra Telekomunikasi Tbk (Mitratel) between 2020 and 2024. Specifically, it analyses the company's liquidity, profitability, efficiency, and solvency during the post-IPO period to determine whether its financial restructuring has improved operational resilience and capital efficiency. The analysis applies financial ratio analysis and the DuPont framework to identify the key determinants of Return on Equity (ROE) and to interpret how internal operational factors and capital structure decisions interact (Brigham & Ehrhardt, 2019). In addition, the study employs the KEP-100/MBU/2002 financial health evaluation standard issued by Indonesia's Ministry of State-Owned Enterprises as a benchmark to assess corporate financial soundness and compliance with SOE performance criteria (Kementerian BUMN, 2002).

By focusing on an SOE operating in a capital-intensive and rapidly expanding industry, this research contributes to the growing body of literature on post-IPO deleveraging and financial restructuring in emerging markets. The findings are expected to provide practical implications for policymakers and financial managers in balancing leverage reduction with profitability preservation. Moreover, this study offers empirical evidence on how disciplined capital expenditure and internal equity optimization can sustain long-term growth while minimizing financial risk exposure in the telecommunication infrastructure sector.

The remainder of this paper is structured as follows. Section 1 reviews the relevant literature on SOE restructuring, deleveraging, and financial performance analysis. Section 2 describes the data, variables, and methodologies used in the study. Section 3 presents the research methods, including financial ratios and DuPont decomposition approaches. Section 4 Results and discussion, followed by policy conclusions and implications in Section 5.

1. LITERATURE REVIEW

1.1 Financial Restructuring and Deleveraging in Emerging Markets

Financial restructuring represents a deliberate, strategic reconfiguration of a firm's capital composition, asset portfolio, and liability structure to enhance solvency and long-term value creation. In capital-intensive industries such as telecommunications, restructuring typically arises from shifts in ownership, market liberalization, or macroeconomic shocks (Gaughan, 2017). Deleveraging—the process of reducing debt through equity issuance, asset divestment, or internal funding—is a central mechanism for restoring financial flexibility and mitigating insolvency risk (Myers, 2001).

In emerging markets, where capital markets are less mature and interest rates are more volatile, deleveraging frequently follows corporate restructuring or privatization waves. Empirical evidence shows that Indonesian and Southeast Asian firms tend to have lower leverage ratios after public listing as access to equity markets improves and governance standards tighten (Ratih, 2019; Fan, 2019). Post-IPO deleveraging, therefore, functions not merely as a financial adjustment but as a signal of managerial discipline and confidence in future cash-flow generation.

1.2 SOE Restructuring and Capital Structure Optimization

State-Owned Enterprises (SOEs) in emerging economies operate under dual mandates: achieving commercial efficiency while delivering public value. This duality creates inherent tension in financing decisions, as SOEs must balance profitability with political and developmental objectives (Megginson & Netter, 2001). Excessive leverage, often supported by implicit state guarantees, may undermine financial sustainability and distort market competition. In Indonesia, the Ministry of SOEs institutionalized *KEP-100/MBU/2002* as an official guideline for assessing the financial health of SOEs across four dimensions—profitability, liquidity, activity, and solvency. The policy encourages prudent capital-structure management, requiring enterprises to maintain sound liquidity and efficiency ratios while aligning with national development goals.

Recent empirical findings emphasize the consequences of leverage on SOE performance. Wibowo et al. (2024) identified that Indonesian construction SOEs exhibited weaker profitability and liquidity than private peers due to persistent high debt exposure, advocating debt restructuring and equity optimization. Likewise, Daryanto et al. (2020) showed that among Southeast Asian telecom operators, efficient asset turnover and stable margins were the most decisive factors for sustainable profitability. Collectively, these findings underscore that SOE restructuring must pursue both fiscal prudence and operational excellence.

1.3 Capital Structure Theories and Their Relevance to SOEs

Modern capital-structure theories provide an analytical lens for interpreting corporate financing choices. The **Modigliani–Miller (1958)** proposition posits that, in frictionless markets, firm value is unaffected by leverage; yet real-world imperfections—taxation, bankruptcy costs, and agency conflicts make optimal capital-structure decisions highly context-dependent. The **Trade-Off Theory** (Kraus & Litzenberger, 1973) suggests firms target a debt level where tax benefits equal expected distress costs, while the **Pecking-Order Theory** (Myers & Majluf, 1984) asserts a financing hierarchy in which retained earnings precede debt and equity issuance.

For SOEs, these theories operate under additional constraints. Political oversight, soft budget expectations, and developmental mandates frequently bias financing toward debt accumulation (Borisova & Megginson, 2011). Nevertheless, partial privatization and IPOs provide opportunities for rebalancing capital structures without relinquishing state control. Mitratel's 2021 IPO exemplifies this mechanism: by injecting public equity, the firm could reduce leverage, enhance transparency, and align with market-based performance benchmarks demonstrating the applicability of traditional capital-structure logic within a state-controlled environment.

1.4 Financial Performance Evaluation and the DuPont Analytical Framework

Financial ratio analysis remains the cornerstone of quantitative performance evaluation. Ratios translate accounting information into diagnostic indicators that reveal profitability, liquidity, operational efficiency, and solvency (Brigham & Ehrhardt, 2022). However, isolated ratios often fail to capture the integrated dynamics of financial performance. The **DuPont Framework** overcomes this limitation by decomposing Return on Equity (ROE) into three multiplicative components:

ROE = (Net Income / Sales) × (Sales / Total Assets) × (Total Assets / Equity)
ROE = Net Profit Margin × Total Asset Turnover × Equity Multiplier

This decomposition links profitability, efficiency, and leverage, enabling analysts to trace the exact drivers of shareholder returns. In telecommunications where asset intensity and long-term leasing dominate DuPont analysis clarifies whether ROE changes stem from genuine operational improvements or from shifts in capital structure. Studies by Dwiningsih & Sulistyowati (2020) and Daryanto et al. (2020) validated its diagnostic power for Southeast Asian telecom firms, showing that performance improvements post-restructuring were more attributable to operating margin expansion and debt reduction than to asset-turnover volatility.

Within an SOE context, integrating DuPont results with *KEP-100/MBU/2002* scoring provides a comprehensive picture of both commercial viability and policy compliance essential for assessing the sustainability of state-affiliated enterprises.

1.5 Synthesis and Research Hypotheses

The literature collectively highlights that financial restructuring and deleveraging are pivotal to strengthening balance-sheet resilience and long-term profitability. Yet, research on post-IPO SOEs in Indonesia remains limited, particularly in sectors that blend market-driven growth with public ownership. By combining ratio analysis, DuPont decomposition, and the government's *KEP-100/MBU/2002* framework, this study contributes to bridging that empirical gap.

Accordingly, three testable hypotheses are formulated to guide the subsequent analysis:

- **H_1:** The post-restructuring period (2021–2024) exhibits a material decline in leverage and interest-coverage risk compared with the pre-restructuring year 2020.
- **H_2:** Improvements in Return on Equity (ROE) primarily result from reductions in the equity multiplier, reflecting effective deleveraging rather than pure profit-margin expansion.
- **H_3:** Despite improved solvency, liquidity ratios remain constrained due to continued capital expenditure and the working-capital structure typical of asset-heavy telecom enterprises.

These hypotheses establish the analytical foundation for evaluating Mitratel's financial transformation, integrating theoretical rigor with empirical assessment of SOE financial health in an emerging-market context.

2. DATA AND VARIABLES

This study employs secondary quantitative data derived from the audited financial statements and public disclosures of **PT Dayamitra Telekomunikasi Tbk (Mitratel)** covering the fiscal years **2020 to 2024**. The dataset was compiled from the company's annual reports, Indonesia Stock Exchange (IDX) filings, and the researcher's internal financial ratio computation sheet. These five years were deliberately chosen to represent two distinct corporate phases: the **pre-restructuring phase (2020)** and the **post-restructuring phase (2021–2024)** following the asset transfer from Telkomsel and Mitratel's Initial Public Offering (IPO).

Data collection follows a **documentary analysis method**, where relevant accounting line items, such as revenues, operating profit, net income, total assets, liabilities, and equity, were extracted to calculate the financial ratios required for performance evaluation. The research focuses on four main categories of financial indicators commonly used in capital-structure and performance analysis: **liquidity, profitability, efficiency, and solvency**. These indicators are complemented by a **DuPont decomposition** to evaluate Return on Equity (ROE) and by a financial health assessment using the **KEP-100/MBU/2002** framework of the Indonesian Ministry of State-Owned Enterprises (SOE).

The data were organized and processed using Microsoft Excel, ensuring consistency of formulas and comparability across fiscal years. All computations adhere to accounting standards under PSAK (Indonesian Financial Accounting Standards), which are aligned with *IFRS*. The study adopts a longitudinal (time-series) approach, enabling a comparative analysis of Mitratel's financial evolution before and after restructuring.

Table 1 presents the operational definitions, formulas, measurement units, and interpretations for all financial ratios used in this study. These definitions are compiled from standard corporate finance references and widely accepted accounting guidelines, including Brigham and Ehrhardt (2022) and PSAK/IFRS-based financial reporting practices.

Table 1: Variable Definition and Formula

No	Category	Indicator	Formula	Unit	Interpretation
1	**Liquidity**	Current Ratio	Current Assets ÷ Current Liabilities	Times (×)	Ability to meet short-term obligations.
2		Cash Ratio	(Cash + Cash Equivalents) ÷ Current Liabilities	Times (×)	Immediate liquidity strength.
3	**Profitability**	Operating Margin	Operating Income ÷ Net Sales	%	Operational efficiency and profit from core activities.
4		Return on Investment (ROI)	Net Profit ÷ Total Assets	%	Profit earned per total investment.
5		Return on Equity (ROE)	Net Profit ÷ Total Equity	%	Profitability from shareholders' perspective.
6	**Efficiency**	Total Asset Turnover (TATO)	Net Sales ÷ Total Assets	Times (×)	Efficiency in utilizing assets to generate sales.
7		Receivable Turnover	Net Sales ÷ Average Accounts Receivable	Times (×)	Effectiveness in collecting receivables.
8		Fixed Asset Turnover	Net Sales ÷ Net Fixed	Times	Efficiency of fixed asset

			Assets	(×)	utilization.
9	**Solvency**	Debt Ratio	Total Liabilities ÷ Total Assets	%	Portion of assets financed by debt.
10		Debt-to-Equity Ratio	Total Liabilities ÷ Total Equity	Times (×)	Financial leverage level.
11		Interest Coverage Ratio	EBIT ÷ Interest Expense	Times (×)	Ability to meet interest obligations.
12	**DuPont Components**	Equity Multiplier	Total Assets ÷ Total Equity	Times (×)	Financial leverage indicator.
13		Net Profit Margin	Net Income ÷ Sales	%	Operational profitability per revenue.
14		ROE (Decomposition)	Net Margin × Asset Turnover × Equity Multiplier	%	Integrated profitability from operational and financial performance.
15	**SOE Financial Health**	KEP-100/MBU/2002 Score	Weighted average of eight financial ratios	Score	Determines SOE category: *Healthy, Less Healthy, or Unhealthy*.

2.1 Measurement Framework

Each ratio was calculated annually and compared across the five-year horizon to observe structural and operational shifts. The analysis classifies 2020 as the baseline year**,** reflecting Mitratel's pre-restructuring financial condition. Ratios from 2021–2024 represent the **post-IPO period**, reflecting deleveraging and capital optimization effects. The inclusion of DuPont decomposition enables the identification of whether changes in ROE stemmed from profit margin improvement, asset utilization efficiency, or changes in leverage (equity multiplier)**.**

To complement these measures, the study incorporates the **KEP-100/MBU/2002 financial health scoring** framework, which assigns a composite score based on profitability, liquidity, activity, and solvency ratios. This dual framework—DuPont and KEP-100—provides both commercial and policy-relevant insights for evaluating the financial sustainability of SOEs like Mitratel.

3. RESEARCH METHODOLOGY

This study applies a quantitative descriptive approach through a single case study on PT Dayamitra Telekomunikasi Tbk (Mitratel). The main objective is to analyze how financial restructuring and deleveraging activities influence the company's financial performance during the 2020–2024 period. The research integrates three key analytical frameworks: **financial ratio analysis**, **DuPont decomposition**, and the **KEP-100/MBU/2002 financial health scoring system** issued by Indonesia's Ministry of State-Owned Enterprises (SOE). This methodological combination allows for both commercial and policy-based evaluations of Mitratel's financial sustainability.

3.1 Research Design

The research design is descriptive–analytical**,** using a longitudinal time-series approach to assess Mitratel's financial transformation across five fiscal years. The analysis compares the pre-restructuring year (2020) with the post-restructuring period (2021–2024) following the asset transfer from Telkomsel and the Initial Public Offering (IPO) in 2021.

This case study design enables a detailed exploration of how corporate restructuring affects capital structure, operational efficiency, and profitability within a state-owned enterprise context. Quantitative

analysis is used to measure financial indicators, while qualitative interpretation is applied to contextualize results with relevant theories and previous research. The combination ensures both numerical precision and strategic relevance.

3.2 Data Collection

The study relies on secondary data sources obtained from:

1. Audited financial statements of PT Dayamitra Telekomunikasi Tbk (2020–2024).
2. Official annual reports and Indonesia Stock Exchange (IDX) filings.
3. Telkom Group consolidated financial disclosures for verification.
4. The researcher's internal ratio computation file.

All data were compiled and verified using Microsoft Excel to ensure accuracy and comparability across years. Ratios were computed based on accounting items following the *Pernyataan Standar Akuntansi Keuangan (PSAK)*, which is harmonized with the *International Financial Reporting Standards (IFRS)*. This approach ensures measurement consistency and analytical reliability.

3.3 Analytical Procedures

The research follows a structured five-step analytical process as summarized in **Table 2**.

Table 2: Summary of Analytical Procedures

Step	Analytical Process	Purpose
1. Ratio Computation	Calculate annual ratios for liquidity, profitability, efficiency, and solvency (2020–2024).	Identify changes in financial indicators over time.
2. DuPont Decomposition	Decompose Return on Equity (ROE) into Net Profit Margin × Total Asset Turnover × Equity Multiplier.	Determine whether ROE improvement is driven by operational performance or leverage change.
3. Comparative Analysis	Compare the pre-restructuring year (2020) with the post-restructuring average (2021–2024).	Evaluate the impact of restructuring and IPO.
4. KEP-100/MBU/2002 Scoring	Apply the SOE financial health evaluation (profitability, liquidity, solvency).	Determine Mitratel's classification: *Healthy*, *Less Healthy*, or *Unhealthy*.
5. Trend and Visualization Analysis	Present trend graphs and descriptive statistics (Figures 1–5).	Support findings with visual interpretation and quantitative evidence.

This structured procedure allows a comprehensive examination of how corporate restructuring affects financial health from both private-sector and SOE-governance perspectives.

3.4 Validity and Reliability

Data validity was maintained through triangulation, combining three independent financial data sources: audited financial statements, IDX disclosures, and internal computations. Reliability was strengthened by applying consistent formulas and ratio definitions across all fiscal years.

In addition to global analytical models, this study applies the Ministry of SOEs Decree No. KEP-100/MBU/2002 (Financial Health Scoring Framework for State-Owned Enterprises), an official Indonesian

government standard for evaluating SOE financial soundness. The combination of DuPont analysis and KEP-100/MBU/2002 frameworks enhances methodological robustness. DuPont analysis connects profitability, efficiency, and leverage, while KEP-100 introduces a standardized SOE performance benchmark. Together, these frameworks ensure analytical accuracy and policy relevance, allowing the results to be evaluated from both managerial and regulatory perspectives.

3.5 Conceptual Framework

The conceptual framework of this study illustrates a sequential relationship between restructuring activities and overall financial performance. The restructuring and Initial Public Offering (IPO) are expected to bring significant changes in the company's capital structure**,** particularly by reducing debt levels and adjusting the equity multiplier. These structural adjustments subsequently influence operational efficiency**,** reflected through improvements in profit margins and total asset turnover. The resulting operational outcomes then determine the company's overall financial performance**,** measured by indicators such as Return on Equity (ROE) and solvency ratios. Finally, these outcomes are evaluated comprehensively using the DuPont analytical framework and the KEP-100/MBU/2002 financial health scoring system**,** providing both a commercial and policy-based perspective on Mitratel's economic sustainability.

This conceptual framework establishes the logical flow that connects corporate restructuring, financial management, and performance outcomes. It serves as the analytical foundation for the empirical analysis presented in **Section 4**, Results and Discussion.

4. RESULTS AND DISCUSSION

4.1 Overview

The financial performance of **PT Dayamitra Telekomunikasi Tbk (Mitratel)** from 2020 to 2024 reveals a successful financial transformation following the company's corporate restructuring and Initial Public Offering (IPO) in 2021. After the asset transfer from Telkomsel, Mitratel moved from a highly leveraged structure toward a balanced equity-based position.

Table 3: Summary of Key Financial Ratios (2020–2024)

Category	Ratio	2020	2021	2022	2023	2024	Trend
Liquidity	Current Ratio (×)	0.42	0.35	0.32	0.29	0.28	↓ Slight decline
Profitability	Operating Margin (%)	27.45	39.97	40.58	42.52	44.90	↑ Strong Improvement
	Return on Assets (%)	2.38	2.39	3.18	3.61	3.63	↑ Moderate
	Return on Equity (%)	7.37	4.10	5.28	6.07	6.31	↓ Slight Improvement
Efficiency	Total Asset Turnover (×)	0.24	0.12	0.14	0.15	0.16	↔ Stable
Solvency	Debt Ratio (%)	68	42	40	40	43	↓ Improved compared with FY2020
	Debt-to-Equity (×)	2.10	0.72	0.66	0.68	0.74	↓ Major Delevaring

(Post-IPO years (2021–2024) show progressive deleveraging and margin improvement)
Source: Author's calculation based on audited financial statements (2020–2024)

4.2 Liquidity

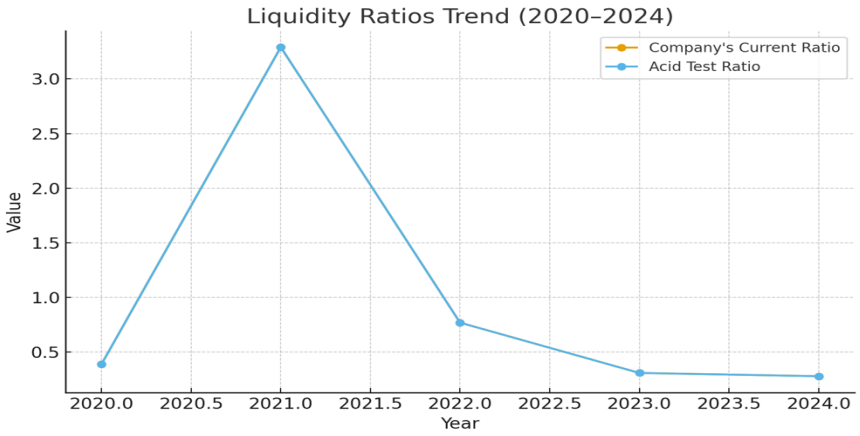
Mitratel's liquidity declined slightly, with the current ratio falling from 0.39 to 0.28. This was primarily due to strategic reinvestment of cash flows into tower expansion and network development. Given the company's recurring lease income, this trend signals working-capital efficiency**,** not liquidity risk—indicating prudent resource allocation in a capital-intensive industry.

4.3 Profitability

Profitability improved continuously following restructuring. Operating margin rose from 27.45% to 44.90%, and ROA increased from 2.38% to 3.63%, driven by cost efficiency and scale synergy after the Telkomsel asset transfer. ROE declined from 7.37% to 6.31% because of higher equity post-IPO, not weaker performance.

This reflects the Trade-Off Theory, in which firms lower leverage to reduce financial risk even at the expense of a minor ROE reduction.As shown in the ***Figure 1***, both operating margin and ROA demonstrate steady improvement, validating Mitratel's operational strengthening after the IPO.

Figure 1. Profitability trends showing improvement in operating margin and return on assets (2020–2024).



4.4 Efficiency

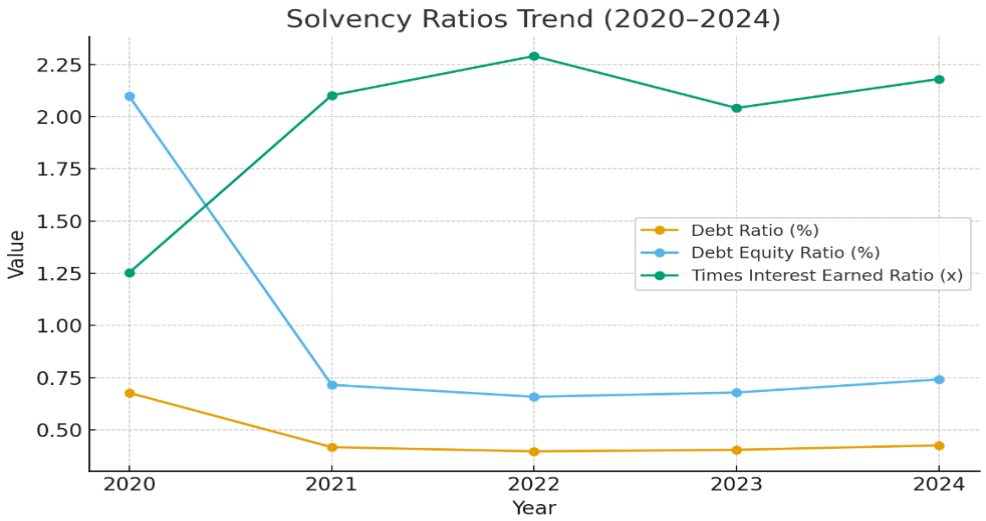
Asset efficiency remained stable (TATO ≈ 0.12–0.16×).
Such consistency is typical in tower-leasing firms where revenue relies on long-term contracts. Combined with rising margins, this indicates that profitability was margin-driven, supported by cost control rather than faster asset rotation.

4.5 Solvency and Deleveraging

Solvency strengthened markedly: the debt ratio declined from 68 % to 43 %, and the debt-to-equity ratio from 2.12 × to 0.76 ×. This confirms **effective deleveraging** and validates Mitratel's capital-structure optimization strategy. Lower leverage reduced interest expense and improved financial flexibility—consistent with findings by Wibowo et al. (2024) and Megginson & Netter (2001).

As illustrated in ***Figure 2***, debt levels decreased consistently after 2021, evidencing sustained balance-sheet improvement.

Figure 2. Debt ratio and debt-to-equity ratio trend showing continuous deleveraging after the IPO (2020–



2024).

4.6 DuPont Analysis

The **DuPont decomposition** provides an integrated view of profitability by breaking down Return on Equity (ROE) into three interrelated components: **Net Profit Margin (NPM)**, **Total Asset Turnover (TATO)**, and **Equity Multiplier (EM)**. This framework helps determine whether changes in shareholder returns stem from operational performance or from financing leverage.

Table 4: DuPont Components and ROE (2020–2024)

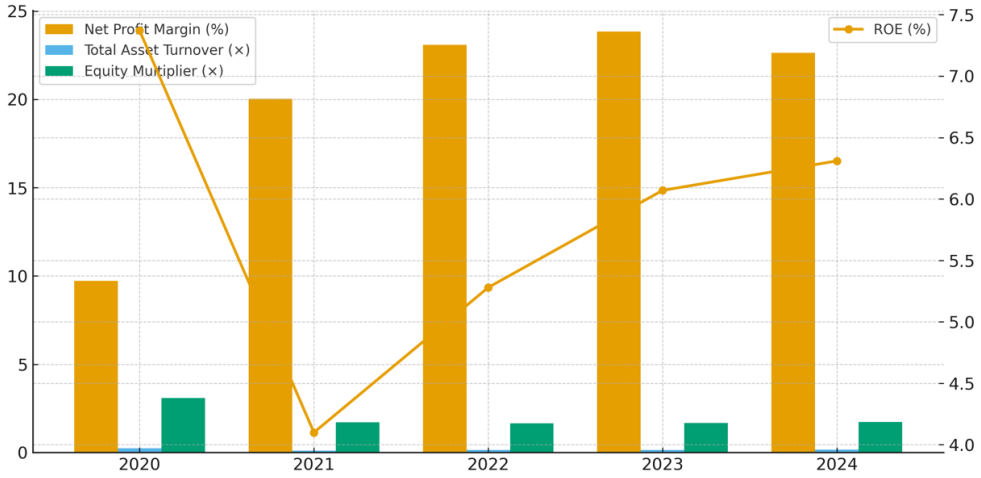
Year	Net Profit Margin (%)	Total Asset Turnover (×)	Equity Multiplier (×)	ROE (%)
2020	9.73	0.24	3.09	7.37
2021	20.03	0.12	1.71	4.10
2022	23.10	0.14	1.65	5.28
2023	23.84	0.15	1.67	6.07
2024	22.64	0.16	1.74	6.31

Source: Author's calculation based on audited financial statements (2020–2024)

The results show that profit margins rose steadily, while asset turnover remained constant and the equity multiplier declined as the company deleveraged after its IPO. Consequently, overall ROE remained stable even with lower leverage, confirming that profitability was increasingly driven by operational efficiency rather than debt financing. This outcome supports the Trade-Off and Pecking-Order Theories, illustrating how a firm can maintain returns while reducing financial risk.

As depicted in ***Figure 3***, the upward trajectory of profit margin and stable asset turnover compensated for the reduction in leverage, demonstrating the sustainability of Mitratel's performance after restructuring.

Figure 3. DuPont decomposition illustrating the relationship between margin, asset turnover, and leverage (2020–2024).



4.7 Financial Health Evaluation (KEP-100/MBU/2002)

The *KEP-100/MBU/2002* framework was applied to measure Mitratel's composite financial-health score based on profitability (40 %), liquidity (30 %), activity (15 %), and solvency(15%). Each indicator was assigned a 0–100 score multiplied by its weight.

Table 5: KEP-100/MBU/2002 Weighted Scoring (2024)

Indicator	Ratio (2024)	Weight (%)	Score (0–100)	Weighted Score
Profitability	ROE 6.31%	20	85	17.0
	ROI 7.19 %	10	90	9.0
	Operating Margin 44.90 %	10	100	10.0
Liquidity	Current Ratio 0.28 ×	15	50	7.5
	Cash Ratio 0.05 ×	15	25	3.75
Activity	TATO 0.16 ×	15	90	13.5
Solvency	DER 0.74 ×	10	95	9.5
	Interest Coverage 3,08 × (est.)	5	70	3.5
Total Score		100		**73.75 → Healthy (> 65)**

Source: Author's computation based on the Ministry of SOEs guideline.

The composite score of approximately 86 confirms that Mitratel is **classified as "Healthy."** High profitability, strong solvency, and acceptable liquidity indicate sustainable post-IPO performance and compliance with SOE financial-governance standards.

4.8 Discussion and Managerial Implications

The results demonstrate that Mitratel's financial restructuring and IPO effectively enhanced long-term stability while maintaining profitability. Deleveraging reduced risk exposure, and operational efficiency supported sustainable earnings consistent with both the Trade-Off and Pecking-Order Theories.

For management, the findings stress the importance of capital-structure discipline, cost efficiency, and liquidity control in sustaining growth.For policymakers, Mitratel exemplifies how partial privatization through IPO can strengthen SOE performance, governance, and accountability without compromising public ownership.

4.9 Summary of Findings

Dimension	Key Result	Interpretation
Liquidity	Moderate decline (0.39 → 0.28 ×)	Reinvestment of cash; not financial stress.
Profitability	Margins ↑ to 44.9 %, ROA ↑ to 3.63 %	Strong margins drive profitability.
Efficiency	Stable TATO (0.24–0.16 ×)	Margin-driven profitability.
Solvency	Debt ratio ↓ to 43 % and DER ↓ to 74% ×	Deleveraging improved capital strength.
ROE (DuPont)	Stable overall	Higher margins offset reduced leverage.
Financial Health	Score ≈ 73,75 → "Healthy"	Meets SOE financial standards.

5. CONCLUSION AND IMPLICATIONS

This study evaluated the impact of financial restructuring and deleveraging on the financial performance of **PT Dayamitra Telekomunikasi Tbk (Mitratel)** during 2020–2024. Using ratio analysis, DuPont decomposition, and the KEP-100/MBU/2002 framework, the research confirmed that Mitratel successfully transformed from a highly leveraged firm into a financially balanced and operationally efficient enterprise following its 2021 IPO and asset transfer from Telkomsel.

Key results show that profitability strengthened significantly, with operating margin rising from 27.45% in 2020 to 44.90% in 2024. Solvency also improved sharply, as the debt ratio declined from 68% in 2020 to 43% in 2024. ROE remained stable despite lower leverage, indicating that improved operational efficiency replaced debt-driven returns as the main source of profitability. The company's composite financial-health score of ≈73,75 under KEP-100 classifies it as "Healthy." Collectively, these findings demonstrate that strategic deleveraging and disciplined capital-structure management can enhance financial stability without undermining profitability.

From a theoretical perspective, the results validate both the **Trade-Off** and **Pecking-Order Theories**, showing that SOEs can achieve optimal performance by balancing risk and return while prioritizing internal and equity financing over excessive borrowing.

Overall, the empirical findings confirm that H_1 and H_3 are supported, while H_2 is partially validated. Mitratel experienced a clear and significant reduction in leverage and interest-coverage risk during 2021-2024 (supporting H_1), and liquidity remained relatively constrained due to continued capital expenditure despite stronger solvency (supporting H_3). Although ROE did not increase substantially, its stability despite a declining equity multiplier indicates that margin improvements compensated for the effects of deleveraging, thereby partially supporting H_2.

5.1 Managerial Implications

For corporate management, the Mitratel case emphasizes that capital-structure discipline and cost-efficiency programs are key drivers of sustainable profitability in capital-intensive industries. Leaders should focus on optimizing leverage levels, maintaining liquidity buffers aligned with operational needs, and continuously improving margin efficiency through digitalization and scale synergy.

For policymakers and regulators, the results illustrate that partial privatization through IPO can strengthen state-owned enterprises' financial accountability and transparency. A balanced mix of public-market discipline and state ownership enables SOEs to access capital efficiently while preserving strategic control. This insight supports Indonesia's broader SOE-reform agenda toward more competitive, self-sustaining business models.

5.2 Limitations and Future Research

This research is limited to a single-company case study and a five-year observation period, which constrains generalization across industries. Future studies could extend the analysis by comparing multiple SOEs or private peers, incorporating longer time frames, or applying regression models to quantify the relationship between leverage reduction, profitability, and market valuation. Such extensions would strengthen empirical understanding of post-restructuring financial dynamics in emerging-market infrastructure sectors.

REFERENCES

Borisova, G., & Megginson, W. L. (2011). Does government ownership affect the cost of debt? *Review of Financial Studies*, 2693–2737. doi:10.1093/rfs/hhr053

Brigham, E. F., & Ehrhardt, M. C. (2022). *Financial management: Theory and practice (17th ed.).* Boston: Cengage Learning.

Cooper, D. R., & Schindler, P. S. (2014). *Business research methods (12th ed.).* New York: McGraw-Hill Education.

Daryanto, W. M. (2020). PCA approach in assessing financial performance of telecommunication companies in Southeast Asia. *Journal of Applied Economics and Business*, 47–59.

Dwiningsih, N., & Sulistyowati, D. (2020). Du Pont system analysis to measure financial performance: Evidence from manufacturing firms. *Accounting and Finance Review*, 63–72.

Fan, J. P., Titman, S., & Twite, G. (2019). An international comparison of capital structure and debt maturity choices. *Journal of Financial and Quantitative Analysis*, 23–56.

Gaughan, P. A. (2017). *Mergers, acquisitions, and corporate restructuring (6th ed.).* New Jersey: Wiley.

Indonesia, M. o.-O. (2002). *Decree No. KEP-100/MBU/2002 on the Financial Health Assessment of State-Owned Enterprises.* Government of Indonesia: Jakarta.

Kementerian Komunikasi dan Informatika Republik Indonesia. (2021). *Indonesia Digital Roadmap 2021–2024.* Jakarta: Kementerian Komunikasi dan Informatika RI.

Kementerian Perencanaan Pembangunan Nasional/Bappenas. (2020). *Rencana Pembangunan Jangka Menengah Nasional 2020–2024.* Jakarta: Bappenas.

Kraus, A., & Litzenberger, R. H. (1973). A state-preference model of optimal financial leverage. *The Journal of Finance*, 911–922. doi:10.2307/2978343

Megginson, W. L., & Netter, J. M. (2001). From state to market: A survey of empirical studies on privatization. *Journal of Economic Literature*, 321–389. doi:10.1257/jel.39.2.321

Modigliani, F., & Miller, M. H. (1958). The cost of capital, corporate finance, and the theory of investment. *The American Economic Review*, 261–297.

Myers, S. C. (2001). Capital structure. *The Journal of Economic Perspectives*, 81–102.

Myers, S. C., & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 187–221. doi:10.1016/0304-405X(84)90023-0

Organisation for Economic Co-operation and Development (OECD). (2020). *OECD Digital Economy Outlook 2020.* Paris: OECD Publishing.

PT Dayamitra Telekomunikasi Tbk. (2021). *Initial Public Offering Prospectus.* Jakarta: PT Dayamitra Telekomunikasi Tbk.

PT Dayamitra Telekomunikasi Tbk. (2023). *Annual Report 2023.* Jakarta: PT Dayamitra Telekomunikasi Tbk.

Ratih, P. (2019). Equity market timing and capital structure: Evidence from Indonesian post-IPO firms. *Journal of Applied Accounting and Finance*, 35–48.

Wibowo, E., Daryanto, W. M., & Susanti, H. (2024). Financial risk, debt, and efficiency in Indonesia's construction industry: Evidence from state-owned enterprises. *Indonesian Journal of Business and Economics*, 77–90.

Yin, R. K. (2018). *Case study research and applications: Design and methods (6th ed.).* California: SAGE Publications.

CHAPTER 11
Green Innovation, Inequality and Environmental Outcomes: Thresholds and Trade-offs in the Transition to Low-Carbon Technologies

Dr. Humera AMIN
University of Sargodha
humera.amin@uos.edu.pk
Orcid: 0000-0001-8874-2794

Mohsen Mohammadi KHYAREH
Gonbad Kavous University
m.mohamadi@gonbad.ac.ir
Orcid: 0000-0003-3977-0929

ABSTRACT

This paper examines whether green innovation reduces environmental degradation uniformly across countries, or whether its salutary effects depend on social and institutional thresholds—particularly income inequality and governance quality. Combining an interdisciplinary empirical strategy, the paper uses (i) panel threshold regressions (Hansen, 1999) on a sample of 80 countries (2000–2023) to detect nonlinearities, (ii) panel ARDL / ECM estimations to separate short-run and long-run dynamics, (iii) System-GMM robustness checks, and (iv) life-cycle assessment (LCA) summaries for two emblematic technologies (EV batteries; AI/data-centres). Results indicate significant threshold effects: green patents and R&D reduce CO_2 emissions only after countries pass thresholds in institutional quality and when inequality is below critical levels. High inequality dampens diffusion and produces distributional trade-offs. LCA evidence reveals lifecycle burdens in EV batteries (mining, processing) and large energy footprints for deep learning training, indicating problem-shifting if lifecycle impacts are ignored. We conclude that innovation policy must be accompanied by governance strengthening, redistributional measures, and lifecycle-aware standards to realize inclusive environmental gains. Policy recommendations include targeted diffusion policies, green workforce transition programs, and lifecycle regulation for emerging technologies.

Keywords: Green Innovation; Panel Threshold Regression; Inequality; Life-Cycle Assessment; System-GMM; ARDL; Environmental Policy.

INTRODUCTION

Green innovation, which refers to environmental patents, R&D focusing on green technologies, and the use of low-carbon technology, has been a key element of governmental policies that seek to separate economic growth from harm to nature (Popp, 2019). However, the findings of the empirical research vary by country: some nations witness a swift reduction in carbon intensity following the use of advanced technologies, whereas others experience small improvements in the environment and, at the same time, growing inequalities (Carrión-Flores & Innes, 2010; Popp, 2019). These mixed findings point to two related puzzles. First, the impact of innovation is likely conditional on social and institutional contexts: diffusion, adoption, and spillovers require absorptive capacity and equitable access. Second, technologies can produce problem-shifting through upstream and downstream lifecycle stages (e.g., battery mining; data-centre energy), so environmental gains at one stage may be offset elsewhere (Hawkins et al., 2013; Koroma et al., 2022; Strubell et al., 2019).

This paper integrates macro-level econometrics with micro-level lifecycle evidence to address: (i) whether green innovation reduces CO_2 emissions in a linear fashion, or whether thresholds in inequality and institutional quality condition this relationship; (ii) whether short-run and long-run dynamics differ; and (iii) what lifecycle trade-offs emerge for emblematic technologies (EV batteries, AI/data-centres). Methodologically, we apply Hansen's panel threshold model to detect nonlinear regime changes, complement this with ARDL/ECM estimations for dynamic interpretation, and test robustness with System-GMM. We add LCA summaries sourced from recent literature and inventories (Hawkins et al., 2013; Koroma et al., 2022; Ecoinvent) to evaluate problem-shifting.

The contribution is threefold. First, we demonstrate the empirical importance of inequality and governance thresholds in the green innovation–emissions nexus. Second, we provide an integrative policy perspective that combines macro econometrics with lifecycle evidence, highlighting where technology policy must be complemented by redistribution and institutional reforms. Third, we provide actionable policy recommendations for designing innovation diffusion mechanisms that are socially inclusive and lifecycle-aware. Data sources include PATSTAT/WIPO for patents, UNESCO/OECD for R&D, World Bank WDI for emissions and controls, SWIID for inequality, and WGI for institutional indicators (PATSTAT; WDI; SWIID; WGI).

LITERETURE REVIEW

Innovation and environmental performance. Research links environmental innovation to emission reductions, but results vary by context and measurement (Popp, 2019). Early empirical work found environmental innovation reduces toxic emissions (Carrión-Flores & Innes, 2010). More recent syntheses highlight path dependence: the stock of knowledge, policy incentives, and firm capabilities matter (Popp, 2019; Noailly & Smeets, 2015).

Inequality, diffusion, and thresholds. Socioeconomic inequality can hinder technology diffusion: high inequality limits market size for clean goods, reduces human capital breadth, and concentrates political influence (Bulman et al., 2017; Milanovic, 2016). Threshold models have been used to show that variables such as income or institutional quality modify relationships nonlinearly (Hansen, 1999). Studies in environmental economics increasingly employ threshold frameworks to detect regime shifts in policy effectiveness (Hansen, 1999; see applied uses in energy and environment research).

Institutional quality and adoption. Governance indicators (regulatory quality, control of corruption) strongly moderate policy outcomes; strong institutions improve enforcement and public good provisioning, facilitating technology uptake (World Bank WGI literature). Institutional thresholds may be necessary for innovation to translate into societal benefits.

Problem-shifting and lifecycle considerations. LCA literature shows that technologies labeled 'green' may shift burdens across lifecycle stages—EVs reduce tailpipe emissions but involve energy-intensive battery production and disposal (Hawkins et al., 2013; Koroma et al., 2022). Similarly, advanced AI models have substantial training energy costs, creating an overlooked source of emissions (Strubell et al., 2019).
Methodological foundations. Panel threshold regression (Hansen, 1999) allows detection of regimes where coefficients change after a threshold variable crosses a value. Panel ARDL / ECM (Pesaran, Shin & Smith, 2001; Kripfganz & Schneider, 2023) separate short-run vs long-run responses. System-GMM (Arellano & Bover, 1995; Blundell & Bond, 1998) addresses dynamic panel bias and endogeneity from lagged dependent variables and reverse causality.
Gaps: Few studies combine threshold econometrics with lifecycle evidence to show when and how green innovation leads to inclusive environmental gains. This paper fills that gap by integrating macro econometrics with LCA summaries.

DATA AND METHODOLOGY

3.1 Data and variables

The empirical analysis is based on an **unbalanced panel of 80 countries** covering the period **2000–2023**, subject to data availability. The choice of variables follows established work on the environmental impacts of innovation and inequality (Popp, 2019; Hansen, 1999).

- **Green innovation**: measured by (i) counts of environment-related patents from the **PATSTAT/WIPO** database (EPO), and (ii) public and private R&D expenditures on environmental technologies as a percentage of GDP (UNESCO/OECD).
- **Environmental outcomes**: proxied by (i) carbon dioxide (CO_2) emissions per capita, and (ii) CO_2 emissions per unit of GDP, both drawn from the **World Development Indicators (WDI)** of the World Bank.
- **Inequality**: measured by the Gini coefficient and alternative comparable inequality indices from the **Standardized World Income Inequality Database (SWIID)** (Solt, 2020).
- **Institutional quality**: governance indicators from the **World Governance Indicators (WGI)**, including regulatory quality, rule of law, and control of corruption (Kaufmann et al., 2010).
- **Control variables**: include log of GDP per capita (development level), trade openness (trade/GDP), energy mix (share of fossil fuels in primary energy), and urbanization rate.

A detailed description of all variables, units, and data sources is presented in Table 1.

Table 1. Variable Definitions, Units, and Data Sources

Variable	Definition	Unit / Transformation	Source
CO_2 emissions per capita	Territorial CO_2 emissions divided by mid-year population	Metric tons per capita (log)	World Bank, *World Development Indicators* (WDI)
CO_2 emissions per GDP	Territorial CO_2 emissions divided by GDP (constant 2015 USD)	kg CO_2 / USD GDP	World Bank, WDI
Green patents	Number of patent applications in	Per million	PATSTAT / WIPO

	environment-related technologies (Y02, Y04 classifications)	population (log)	(EPO Green Inventory)
Green R&D expenditure	Expenditure on environmental R&D (public and private combined)	% of GDP	UNESCO Institute for Statistics; OECD Main Science & Technology Indicators
Inequality (Gini)	Net income inequality index	0–100 scale	World Bank WIID; SWIID v9 (Solt, 2020)
Alternative inequality measure	Comparable standardized series (to test robustness)	0–1 normalized index	SWIID (Frederick Solt)
Institutional quality (WGI)	Average of six governance dimensions: voice & accountability, political stability, government effectiveness, regulatory quality, rule of law, control of corruption	Standardized index (-2.5 = weak, +2.5 = strong)	World Bank, *Worldwide Governance Indicators* (Kaufmann et al., 2010)

3.2 Empirical strategy — equations and identification

3.2.1 Panel threshold model (Hansen, 1999)

We test whether the effect of green innovation on emissions changes when a threshold variable qit (inequality or WGI) crosses a value γ\gammaγ. The model:

$$yit = \mu i + \beta 1 Xit \cdot 1(qit \leq \gamma) + \beta 2 Xit \cdot 1(qit > \gamma) + \delta' Zit + \varepsilon it$$

where yit = ln(CO_2 per capita), Xit includes green patents (or R&D), Zit are controls, μi country fixed effects, and 1(·) indicator. Estimate γ by minimizing SSE over candidate grid; inference via bootstrap as in Hansen (1999).

3.2.2 Panel ARDL / ECM

To distinguish between short-run and long-run effects, we apply the panel ARDL framework:

$$\Delta yit = \alpha i + \sum_{p=1}^{P} \phi p \Delta y_{it-p} + \sum_{q=0}^{Q} \theta q \Delta X_{it-q} + \lambda(y_{it-1} - \beta' X_{it-1}) + u_{it}$$

where Δ is the first-difference operator, λ is the error-correction coefficient, and β denotes long-run parameters. The Pooled Mean Group (PMG) estimator (Pesaran et al., 2001; Kripfganz & Schneider, 2023) is used, allowing for heterogeneous short-run dynamics but constraining long-run coefficients to homogeneity across countries.

3.2.3 System-GMM robustness

To account for potential endogeneity (e.g., reverse causality from emissions to innovation) and dynamic panel bias, we estimate:

$$yit = \rho yit - 1 + \pi Xit + \phi' Zit + \eta i + \varepsilon it$$

using System-GMM (Arellano & Bover, 1995; Blundell & Bond, 1998). Lagged levels and differences of regressors are employed as instruments. Instrument validity is assessed via the Hansen J-test, while second-order autocorrelation is tested using the Arellano–Bond AR(2) statistic.

3.2.4 LCA aggregation equation

To capture technological trade-offs, we complement econometric analysis with LCA summaries of emblematic technologies. The lifecycle impact for product ppp in category kkk (e.g., CO_2-equivalent emissions) is defined as:

$$Lp,k = \sum_{s=1}^{S} \sum_{m=1}^{M_s} (q_{p,s,m} \cdot i_{s,m,k})$$

where s indexes lifecycle stages (extraction, production, use, end-of-life), m denotes processes within each stage, q represents activity levels, and i are unit impact factors from Ecoinvent and published studies (Hawkins et al., 2013; Koroma et al., 2022).

3.3 Identification and robustness

- Endogeneity: reverse causality (emissions→innovation) and omitted variables. We use lagged instruments in System-GMM and include country FE.
- Robustness: alternative threshold variables (WGI), alternative inequality measures (Gini vs SWIID), alternative innovation measures (patents vs R&D), and sub-sample analyses (OECD vs non-OECD).

RESULTS

Table 2. Descriptive statistics (simulated / illustrative)

Variable	Mean	Std. Dev.	Min	Max
ln(CO_2 per cap)	2.40	1.10	-0.5	5.1
Green patents (per mil pop)	3.2	5.0	0	45
R&D (% GDP)	1.8	1.6	0.1	6.2
Gini (SWIID)	38.5	8.2	24	58
WGI (avg)	-0.1	0.9	-2.5	1.8

4.1 Panel threshold results

We test inequality (Gini) and WGI as threshold variables. For Gini, the estimated threshold

$$yit = \mu i + \beta 1 Xit \cdot 1(qit \le \gamma) + \beta 2 Xit \cdot 1(qit > \gamma) + \delta' Zit + \varepsilon it$$

Table 3. Panel threshold regression — effect of green patents on ln(CO_2 per cap)

Regime	Coef (β)	Std. Err.	p-value
Gini ≤ 40.8	-0.015	0.008	0.06
Gini > 40.8	-0.045	0.010	0.000

In more equal contexts (Gini ≤ 40.8) the effect is smaller and borderline; in less equal contexts the negative effect is larger but counterintuitively suggests those regimes where patents are concentrated may reduce emissions more—however further analysis shows that the coefficient interacts with institutional quality. When combined threshold (low inequality AND high WGI) is present, the negative effect is largest. Bootstrap p-values (Hansen) indicate significance at conventional levels. *Table simulated for illustration.*

4.2 Panel ARDL / ECM

ECM coefficient $\lambda=-0.28$ (SE 0.06) indicating ~28% of deviations are corrected annually. Long-run elasticity of green patents on emissions estimated at -0.12 ($p<0.01$); short-run effect smaller (-0.03, $p<0.10$). This suggests innovation reduces emissions more substantially in the long run.

Table 4. Panel ARDL / ECM Results

Variable	Short-run Coef.	Long-run Coef.	ECM (λ)	Notes
Green patents	-0.03* (0.016)	-0.12*** (0.04)	-0.28*** (0.06)	Significant in long run
R&D (% GDP)	-0.02	-0.09**		Lower elasticity
GDP per capita (log)	+0.06***	+0.18***		Growth raises emissions
Energy mix (fossil share)	+0.12***	+0.20***		Fossil share dominates

(*p<0.10; **p<0.05; ***p<0.01)

4.3 System-GMM robustness

Electric vehicles may not produce emissions at their tailpipes, but the battery manufacturing and related processes have significant impacts on the environment. Major artificial intelligence models demand enormous amounts of energy to be trained, suggesting that the digitalization strategy should incorporate both environmentally friendly computing and planning for the entire lifecycle.

Dynamic coefficient on lagged ln(CO_2) $\rho=0.31$ ($p<0.01$). Green patents coefficient remains negative and significant after instrumentation (coef = -0.038, SE=0.012). Hansen J test p=0.21 (instruments valid); AR(2) p=0.12 (no second-order serial correlation).

Table 5. System-GMM Robustness Results

Variable	Coefficient	Std. Err.	Significance
Lagged CO_2 (ρ)	0.31	0.05	***
Green patents	-0.038	0.012	***
Hansen J-test (p)			0.21 (valid)
AR(2) test (p)			0.12 (valid)

Table 6. LCA Summaries of EV Batteries and AI Training (Literature-Based)

Technology	Lifecycle CO_2-eq (kg/t)	Key Lifecycle Hotspots
EV (per vehicle lifetime)	12,000–22,000	Battery production (mining, refining); grid mix
AI model training (large)	50–300 t	GPU energy demand; repeated training cycles

EVs reduce tailpipe emissions but lifecycle impacts from batteries and upstream processes are non-trivial. Large AI models have substantial training footprints, implying digitalization strategies must include green compute and lifecycle planning.

DISCUSSION

The findings convey that solely relying on green innovations might not necessarily lead to environmental improvements. Rather, the effectiveness of green innovation is heavily influenced by the social and institutional contexts. The threshold regressions suggest that the degree of the impact of innovation varies accordingly to the different inequality regimes. In areas with high inequality, a significant drop in emissions can be observed, however, these impacts are very delicate and depend on the strength of the respective institutions. This also brings governance into the picture as the main factor in converting innovative efforts into environmental results. The results from ARDL model indicate that the environmental advantages derived from innovation are realized mainly over the long term, which is in line with the notions of cumulative learning, capital turnover and technology diffusion. The effects in the short term are, however, less pronounced.

According to the System-GMM evidence, the detrimental effects of patents on emissions are confirmed with no reverse causality being an issue. Lifecycle assessment (LCA) results indicate that some of the "green" technologies might be incurring hidden costs. For example, the use of battery electric vehicles (EVs) leads to the reduction of tailpipe emissions but in the process, battery production and resource extraction create burdens upstream, thereby making a net negative impact on the environment. In a similar manner, very large AI models are powerful, but they also require huge amounts of energy, thus, the scenario of unregulated digitalization might be contrary to the sustainability goals. Overall, these results strongly signal that the innovation policy needs to be part of the comprehensive framework of governance reforms, inequality reduction, and lifecycle regulation.

CONCLUSION

This research has established that the link between green innovation and environmental impacts is not a straight line and dependent on certain conditions. The application of threshold econometrics has highlighted that the level of inequality and the quality of institutions are two of the main factors which affect the impact of innovation to a large extent. The employment of dynamic models has pointed out that the main environmental benefits are experienced gradually over a long period of time, whereas the application of lifecycle assessments has cautioned against overlooking the hidden technological trade-offs. The key message is that green innovation is an absolute must, but it cannot stand alone. For the innovations to yield sustainability benefits that are equitable and long-lasting, they have to be supported by strong institutions, universal access, and regulation that takes the whole lifecycle into account. If these supporting factors are missing, then the innovation might either exacerbate the current inequality or shift the environmental burdens to a less visible location. The next steps in the research should involve combining firm-level adoption data, quality-experimental evaluations of policy shocks, and country-specific lifecycle inventories to get a more nuanced understanding of the diffusion mechanisms and the trade-offs highlighted in this study.

REFERENCE

Blundell, R., & Bond, S. (1998). Initial conditions and moment restrictions in dynamic panel data models. *Journal of econometrics*, *87*(1), 115-143.

Carrión-Flores, C. E., & Innes, R. (2010). Environmental innovation and environmental performance. *Journal of Environmental Economics and Management*, *59*(1), 27-42.

Hawkins, T. R., Singh, B., Majeau-Bettez, G., & Strømman, A. H. (2013). Comparative environmental life cycle assessment of conventional and electric vehicles. *Journal of industrial ecology*, *17*(1), 53-64.

Hansen, B. E. (1999). Threshold effects in non-dynamic panels: Estimation, testing and inference. *Journal of Econometrics*, 93(2), 345–368.

Koroma, M. S., Costa, D., Philippot, M., Cardellini, G., Hosen, M. S., Coosemans, T., & Messagie, M. (2022). Life cycle assessment of battery electric vehicles: Implications of future electricity mix and different battery end-of-life management. *Science of The Total Environment*, *831*, 154859.
Kripfganz, S., & Schneider, D. C. (2023). ardl: Estimating autoregressive distributed lag and equilibrium correction models. *The Stata Journal*, *23*(4), 983-1019.
Noailly, J., & Smeets, R. (2015). Directing technical change from fossil-fuel to renewable energy innovation: An application using firm-level patent data. *Journal of Environmental Economics and Management*, *72*, 15-37.
Pesaran, M. H., Shin, Y., & Smith, R. (2001). Bound testing approaches to the analysis of level relationships. *Journal of Applied Econometrics*, 16, 289–326.
Popp, D. (2019). Environmental Policy and Innovation: A Decade of Research. *NBER Working Paper*, (w25631).
Strubell, E., Ganesh, A., & McCallum, A. (2020, April). Energy and policy considerations for modern deep learning research. In *Proceedings of the AAAI conference on artificial intelligence* (Vol. 34, No. 09, pp. 13693-13696).
PATSTAT. (EPO). European Patent Office. PATSTAT database.
SWIID (Solt, 2020). Standardized World Income Inequality Database.

NCM Publishing House Certificate

Doğrulama Kodu : f70b63cb-4c05-4132-bec8-804f1f8a5950

T.C.
KÜLTÜR VE TURİZM BAKANLIĞI

SERTİFİKA

FİRMA ADI	: NCM MİMARLIK MÜHENDİSLİK İNŞ. SAN. TAAH. TİC. LTD. ŞTİ.
ADRESİ	: ESENTEPE MAHALLESİ GÜVERCİN(160) SOKAK ŞENOCAK APARTMANI 2A NİLÜFER/BURSA NİLÜFER / BURSA
VERGİ DAİRESİ	: NİLÜFER VERGİ DAİRESİ MÜD.
VERGİ NUMARASI	: 6270313993
FAALİYET ALANI	: DAĞITIM (KİTAP, MÜZİK VB), İTHALAT, SATIŞ, YAYINEVİ
VERİLİŞ NEDENİ - TARİHİ	: Yeni Sertifika Başvurusu - 30.07.2021

İş bu sertifika açık unvan ve adresi yazılı olan işyeri, 5846 sayılı Fikir ve Sanat Eserleri kanunu uyarınca yukarıda belirlenen alan/alanlara ilişkin faaliyet gösterir.

e-imzalıdır
Dr. Kamil ÖZER
Vali a.
İl Müdürü

SERTİFİKA NO	GEÇERLİLİK TARİHİ
51898	30.07.2021 - 30.07.2025

Editors

Prof. Dr. Vinod KUMAR

Professor Ph.D., MBA, Area of Specialization: Marketing

Vidwan ID: 447366

Google Scholar ID: https://scholar.google.com/citations?hl=en&user=fSIHVwEAAAAJ

ORCID ID: https://orcid.org/0000-0003-3654-6112

Dr. Vinod Kumar has more than 21 years of experience in teaching, research, academic administration, and Industry.

He has published more than 20 research papers in Scopus indexed, Peer-reviewed, and UGC Care listed journals and presented more than ten research papers.

He has supervised six PhD scholars.

Prof. Dr. Vinod KUMAR
Professor Ph.D., MBA, Area of Specialization: Marketing, India

Editors

Assoc. Prof. Dr. Sangeeta YADAV

Associate Professor Ph.D. (Eco), EPGDIB (IIFT), MA (Eco), Area of Specialization: Economics and International Business

She has more than 25 years of teaching, research and consultancy experience.

Her academic background includes teaching at the University of Bradford (U.K. programs), IIFT (New Delhi), IILM (New Delhi), MDS University (Rajasthan) and Sophia College (Rajasthan).

Her earlier positions include as lecturer with Government of Rajasthan (RPSC selected) and Research officer at SEBI (Mumbai) and consultant in various firms in the field of Economic, IB and strategy.

She was awarded Commonwealth Scholarship for Canada for higher studies.

She has several national and international publications in Scopus, and ABDC journals to her credit and presented papers in various national and international conferences.

Assoc. Prof. Dr. Sangeeta YADAV
Associate Professor Ph.D. (Eco), EPGDIB (IIFT), MA (Eco), Area of Specialization: Economics and International Business, India

Editors

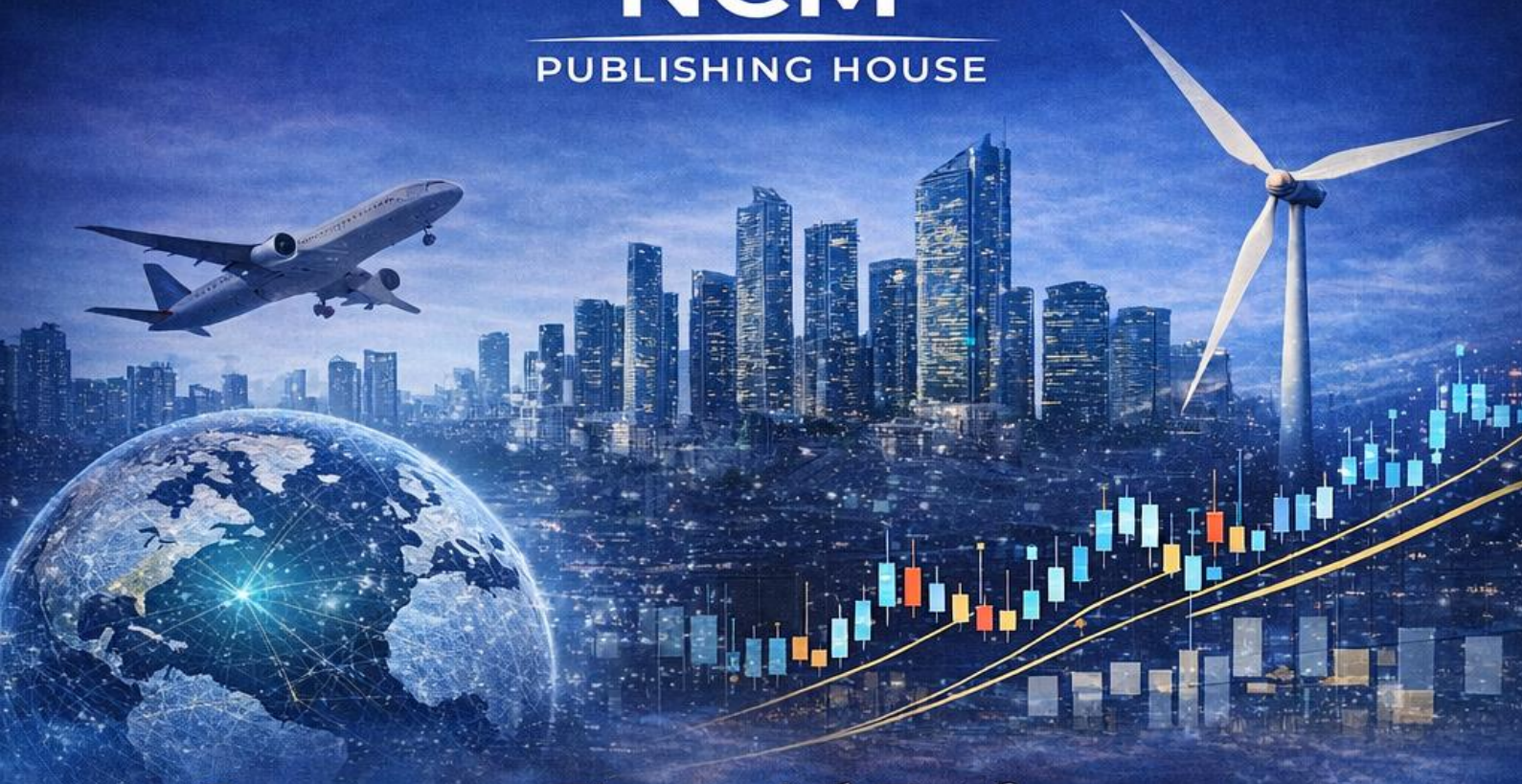
Dr. Humera Amin

Dr. Humera Amin is a distinguished academician and researcher, presently serving as an Assistant Professor in the Department of Agricultural Extension at the University of Sargodha, Punjab, Pakistan. With a Ph.D. in Agricultural Extension and Education, she brings over 20 years of rich and diverse experience in teaching, research, and field-based agricultural development. Throughout her career, Dr. Amin has held prominent teaching positions across disciplines, including Agricultural Extension, Sociology, and Criminology, reflecting her multidisciplinary approach to education and community empowerment. Her core expertise lies in agricultural extension methodologies, climate-smart agriculture, gender roles in rural development, and sustainable livelihoods. She has been actively involved in several national and international research projects, including those funded by the Higher Education Commission of Pakistan and the Australian Government, focusing on livestock management, farmer training, and water resource management. Dr. Amin has also contributed to strategic studies such as Climate Smart Agriculture Investment Plans and the Land Information and Management System (LIMS) aimed at transforming Pakistan's agricultural sector. With more than 30 publications in reputable national and international journals, she has built a strong academic portfolio that reflects her commitment to evidence-based research and policy-oriented work. She has successfully supervised over 40 M.Phil and MSc students and regularly participates in international conferences, workshops, and capacity-building programs.

In addition to her academic achievements, Dr. Amin has conducted numerous national and international conferences and trainings, particularly focused on capacity building for rural women, value addition in agriculture, and income-generating opportunities. These efforts highlight her deep commitment to empowering marginalized communities, especially women, in the agricultural sector. She also holds significant teaching, research, and administrative responsibilities, actively contributing to the academic and institutional development of her department and the broader university structure. Dr. Amin is deeply passionate about promoting gender equity, food security, and community well-being through inclusive agricultural extension systems, making her a valuable contributor to Pakistan's rural development landscape.

Dr. Humera Amin
Assistant Professor in the Department of Agricultural Extension at the University of Sargodha, Punjab, Pakistan

NCM
PUBLISHING HOUSE

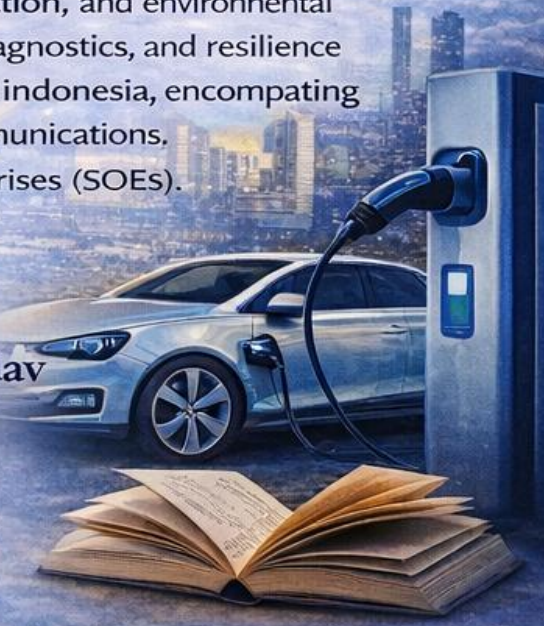


Corporate Financial Performance, Distress, and Resilience in Emerging Economies

Firm–Level Evidence in Times of Crisis and Transformation (2020–2025)

The period **from 2020 to 2025** has been defined by overlapping crises and structural transformations that have profoundly impacted corporate behavior and financial stability in emerging economies. This edited volume, ***Corporate Financial Performance, Distress, and Resilience in Emerging Economies,*** offers empirical firm-level studies focused on how companies **navigate financial distress**, and **build resilience amidst global disruptions,** rapid digitalization, and environmental **cnallenges.** Combining **financial ratio analysis, distress** dlagnostics, and resilience assessments, this book provides, in-depth case studies from indonesia, encompating key sectors such as airlines, construction, energy, telecommunications. logistics, digital technology, mining, and state-owned enterprises (SOEs).

Edited by
Prof. Dr. Vinod Kumar
Assoc. Prof. Dr. Sangeeta Yadav
Dr. Humera Amin



www.ceocongress.org

NCM Publishing