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# The Effect of Capital Structure, Sales Growth, Cash Turnover, and Firm Size on Profitability Mediated by Operational Effiency: Evidance from Healthcare Industry Listed on IDX

Hamad Syofyan[1]✉, Halkadri Fitra[2]

[1,2]Department of Management, Faculty of Economic and Business, Universitas Negeri Padang

hmdsyfynstudent@gmail.com

**Abstract**

This study examines the effect of capital structure, sales growth, cash turnover, and firm size on profitability mediated by operational efficiency in Indonesia's healthcare industry listed on the Indonesia Stock Exchange (IDX) during 2020–2024. The healthcare sector is a capital-intensive industry that faces high operational costs and complex regulations, leading to fluctuating profitability despite strong sales growth. This topic is relevant because previous studies provide inconsistent findings regarding the relationship between leverage and profitability in capital-intensive firms. The research adopts a quantitative approach using secondary data from financial statements of healthcare companies listed on IDX. Samples were selected through a purposive sampling technique, and panel data regression with the Fixed Effect Model (FEM) was used for hypothesis testing. Operational efficiency was analyzed as a mediating variable through the Sobel test to examine indirect effects. The findings of this study indicate that capital structure (DER) and firm size have a significant negative effect on operational efficiency. However, capital structure does not significantly affect profitability (ROA), while firm size has a significant negative effect on profitability (ROA). The results also show that sales growth and cash turnover have no significant effect on operational efficiency. Furthermore, operational efficiency is proven to mediate the negative and significant effects of capital structure and firm size on profitability (ROA), but it does not mediate the relationship between sales growth and cash turnover with profitability (ROA).These findings imply that healthcare companies should optimize their capital structure and asset utilization while enhancing operational efficiency to sustain profitability.

Keywords: Capital Structure, Firm Size, Operational Efficiency, Profitablity, Healthcare



## 1. Introduction

The healthcare industry, as a capital-intensive sector dependent on long-term investment, demands substantial financing in infrastructure, medical technology, and pharmaceuticals. These requirements lead to high operational costs, reducing profit margins and exposing firms to complex financial challenges. In Indonesia, the sector includes hospitals, pharmaceutical manufacturers, medical device producers, and diagnostic laboratories, all of which are integral to the nation's public health system. Recent years have witnessed robust growth in this industry, driven by technological advancement, demographic changes, and the government's National Health Insurance (JKN) program. According to data from the Ministry of Health 2023, national healthcare expenditure reached IDR 490 trillion in 2023, a sharp increase from IDR 423 trillion in 2021. Similarly, data from the Indonesia Stock Exchange (IDX) revealed an average annual growth rate of 15.3% in the healthcare sector since 2019. Despite these promising indicators, profitability has not increased proportionately with sales revenue. Many healthcare companies have reported declining or stagnant profit margins due to stringent regulations, high fixed costs, and volatile reimbursement systems linked to insurance policies.

Profitability, as measured by Return on Assets (ROA), reflects a firm's efficiency in utilizing assets to generate earnings. Data from the Financial Services Authority 2023 show that the average ROA for healthcare companies in Indonesia stood at 4.2%, still lagging behind other sectors such as technology, which averaged 7.5%. This situation illustrates a paradox while sales performance continues to rise, the industry struggles to convert revenue growth into net profitability. Several factors, including cost inefficiency, suboptimal asset utilization, and capital structure imbalance, contribute to this persistent profitability gap. ROA of Industries In Indonesia on Figure 1.


Figure 1. ROA of Industries In Indonesia

There is a striking difference in ROA across industry sectors in Indonesia. The transportation and logistics sector recorded the highest ROA at 3.79%, while the healthcare sector ranked lowest at only 1.11%. Low ROA can indicate structural financial issues triggered by various factors such as substantial investment in

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healthcare facilities and medical technology, government price regulation, and dependence on intensive resources. This condition can have long-term impacts on the sustainability of the healthcare sector, including investment capacity, service innovation development, and investor attractiveness.

The capital structure of healthcare firms plays a decisive role in determining profitability. As capital-intensive entities, these firms rely heavily on debt financing to fund operations and facility expansion. However, empirical evidence indicates that excessive leverage negatively affects profitability. Studies such as [1] and [2] suggest that a moderate Debt-to-Equity Ratio (DER) between 0.9 and 1.2 is optimal for maintaining financial performance, while higher ratios increase interest burdens and reduce ROA. Interestingly, even firms with low DER levels sometimes exhibit low profitability, implying that the relationship between leverage and performance may not be linear. ROA Ratio of Healthcare Industry Companies for the Period 2020-2024 on Table 1.

Table 1. ROA Ratio of Healthcare Industry Companies for the Period 2020-2024

| Company | DER | | | | |
|---|---|---|---|---|---|
| | 2020 | 2021 | 2022 | 2023 | 2024 |
| DVLA | 0,50 | 0,51 | 0,43 | 0,45 | 0,49 |
| KLBF | 0,23 | 0,21 | 0,23 | 0,17 | 0,20 |
| MIKA | 0,16 | 0,16 | 0,13 | 0,11 | 0,13 |
| PRDA | 0,25 | 0,21 | 0,16 | 0,15 | 0,14 |
| SIDO | 0,19 | 0,17 | 0,16 | 0,15 | 0,13 |
| SRAJ | 1,48 | 1,53 | 2,03 | 2,02 | 2,10 |
| TSPC | 0,43 | 0,40 | 0,50 | 0,40 | 0,36 |

It can be seen that the overall DER in the healthcare industry is below 0.5, indicating a low level. When compared to the ROA data, even though a low DER for health care companies is present, this does not necessarily indicate a high ROA. These findings reveal a research gap regarding the relationship between DER and ROA. Most previous studies, such as those by [2] and [1] emphasize that high DER leads to declining profitability (ROA), while moderate debt levels can impact ROA. However, empirical data on healthcare companies indicates that low DER does not always lead to high ROA. This phenomenon aligns with a study [3], which identified an inverted U-shaped relationship between leverage and profitability, suggesting that low debt levels are just as risky as high debt levels. In this context, companies with low and optimal DER levels can still potentially experience low ROA due to limited funding sources, suboptimal cost structures, low asset utilization and high operational cost pressures.

Another critical factor is sales growth, which signifies market demand and operational scalability. In theory, rising sales should enhance profitability through economies of scale and improved productivity. Nevertheless, evidence from [4], reveals that sales growth does not automatically translate into higher returns if cost management and asset utilization remain inefficient. For healthcare firms, fluctuating drug prices, dependence on imported raw materials, and complex distribution chains can diminish the positive effects of revenue expansion on profitability. Another problem arises in the healthcare industry, which has high operating costs. Increased sales that are not accompanied by cost control and increased productivity also risk increasing variable costs, increasing operational complexity, and reducing profit margins. According to [5] when a company experiences high sales growth and liquidity, if its assets are not utilized productively, it will result in minimal or negative profits, creating the illusion of performance where revenue increases but margins shrink due to wasteful spending.

Cash turnover also represents a vital determinant of financial health in the healthcare sector. Firms in this industry often face delayed cash inflows due to insurance claim processing and long receivable cycles, which complicate liquidity management. Research by [6] [7] confirms that efficient cash management enhances profitability by reducing financing costs and improving working capital utilization. Conversely, excessive idle cash indicates inefficiency, while slow cash cycles restrict reinvestment capacity and operational flexibility. In many cases, companies with high liquidity are unable to maximize profits because their cash is not utilized efficiently. This phenomenon occurs because high liquidity can be counterproductive when cash remains idle in the form of balances that are neither invested nor used effectively. The healthcare industry requires both cash availability and active cash management due to fluctuating demand and the high need for medicines and medical equipment. Active cash management is characterized by high cash turnover and efficient cash utilization.

Cash availability is crucial in line with Keynes's liquidity preference theory, which states that companies with high operational needs and exposure to environmental uncertainty such as those in the healthcare industry must maintain cash reserves as a precautionary measure against potential disruptions. Meanwhile, a high cash turnover reflects a company's ability to convert cash within a relatively short period. In the context of the supply chain, according to [8] cash efficiency affects supply chain effectiveness in the medical sector, which requires high speed and responsiveness. Furthermore, the healthcare industry, which tends to be more debt-dependent, relies heavily on efficient cash management to meet its debt obligations. With higher efficiency, available cash can be allocated to drive value creation and long-term profitability through investments in productive assets, maintenance of service facilities, and human resource development. This is supported by [9], who argue that capital structure and liquidity can significantly influence profitability when a company's operational efficiency is also high. High operational efficiency contributes to accelerating the cycle through optimal inventory management, faster collection of receivables (such as payments from patients, health insurance claims, and BPJS), and effective control of production

and distribution costs. When cash turnover increases, a company can utilize its assets more effectively, thereby enhancing return on assets (ROA). Conversely, slow cash turnover ties up working capital for longer periods, which can reduce liquidity and the asset's ability to generate profits.

Firm size further contributes to variations in profitability. Larger companies generally benefit from economies of scale and better access to capital markets, but they also encounter higher bureaucratic and operational costs. Empirical studies by [9] [10] show that larger healthcare firms exhibit more stable but not necessarily higher profitability compared to smaller firms. This disparity suggests that efficiency, rather than sheer asset size, determines long-term financial sustainability. Operational efficiency serves as the mediating mechanism linking financial and operational variables to profitability [11]. Efficient firms optimize resource use, reduce unnecessary costs, and accelerate cash cycles, thereby transforming capital inputs into profit outputs. In the healthcare context, operational efficiency entails effective asset utilization, cost control in procurement and logistics, and optimal scheduling in service delivery. Without such efficiency, capital structure adjustments or sales expansion efforts will have limited impact on profitability.

Given these dynamics, the healthcare industry's profitability dilemma high revenue yet low ROA, underscores the importance of examining the mediating role of operational efficiency. This research aims to analyze how capital structure, sales growth, cash turnover, and firm size collectively influence profitability through the lens of operational efficiency. The study focuses on healthcare companies listed on the Indonesia Stock Exchange between 2020 and 2024, a period marked by recovery and transformation following the COVID-19 pandemic. Therefore, the central problem addressed in this research lies in understanding why profitability remains low despite strong growth indicators. By investigating the mediating influence of operational efficiency, this study seeks to provide empirical evidence and managerial insights into how healthcare firms can balance capital decisions, liquidity management, and operational performance to achieve sustainable profitability. Ultimately, the findings are expected to contribute both theoretically to corporate finance literature and practically to strategic decision-making within the healthcare sector.

## 2. Research Method

This study employs a quantitative explanatory research design aimed at testing hypotheses regarding the relationships between financial variables, operational efficiency, and profitability. The quantitative approach was chosen because it enables statistical testing of causal relationships among measurable financial indicators and allows for generalization across the healthcare industry. The research population includes all healthcare sector companies listed on the Indonesia Stock Exchange (IDX). Using a purposive sampling technique, 12 companies were selected based on the following criteria: (1) active listing from 2020–2024, (2) consistent publication of annual and quarterly financial reports, and (3) continuous profitability during the observation period. The total number of firm year observations is 60 (12 firms × 5 years). This sampling method ensures that only companies with complete and reliable financial data are included in the analysis. Secondary data were obtained from audited annual reports and financial statements published on the official IDX website (*www.idx.co.id*) and company disclosures. Data verification was performed to ensure accuracy and consistency across reporting years. Two panel data regression models were employed to test the study hypotheses:

*Model I: Determinants od Operational Efficienct*

$$Z = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + e$$

Where: Z = Operational Efficiency (TATO)
X1 = Capital Structure (DER)
X2 = Sales Growth
X3 = Cash Turnover
X4 = Firm Size.

*Model II: Determinants of Profitability with Mediation*

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 Z + e$$

Where: Y = Profitability (ROA)
Z = Operational Efficiency as the Mediating Variable.

Data analysis in this study was carried out through several interconnected stages to ensure analytical rigor and accuracy. Initially, descriptive statistical analysis was employed to summarize and explain the characteristics of the data through measures such as mean, variance, maximum, minimum, skewness, and kurtosis, providing an overview of the distribution and variability of the observed financial indicators [12]. Subsequently, panel data regression analysis was utilized to examine the relationship between the independent variables capital structure, sales growth, cash turnover, and firm size and the dependent variable, profitability, with operational efficiency serving as a mediating variable [13]. The analysis was structured into two models: the first model assessed the effect of the independent variables on operational efficiency, while the second model evaluated both the direct and indirect effects of these variables on profitability [14]. To identify the most suitable estimation model, a series of selection tests were conducted, including the Chow Test, Hausman Test, and Lagrange Multiplier (LM) Test, which determined whether the Common Effect, Fixed Effect, or Random Effect model best fitted the data [13]. Based on the results of the Chow and Hausman tests, the Fixed Effect Model (FEM) was selected to control for firm-specific heterogeneity and ensure unbiased estimations [15]. Once the appropriate model was determined, classical assumption tests specifically multicollinearity and heteroscedasticity tests were performed to verify the model's validity and the reliability of parameter estimates [16].

Furthermore, path analysis was conducted to explore both direct and indirect relationships between the studied variables, confirming operational efficiency's role as an intervening variable [15]. The hypothesis testing process included the F-test to assess overall model feasibility, the t-test to examine the individual significance of each independent variable, and the Adjusted $R^2$ to measure the explanatory power of the regression model [15]. In addition, the Sobel Test was applied to validate the mediating role of operational efficiency in strengthening or weakening the link between the independent variables and profitability [11] [12]. Overall, the use of panel data regression particularly the Fixed Effect Model was justified by its capacity to capture firm-specific heterogeneity and dynamic financial behavior over time, enhancing analytical precision, robustness of results, and the relevance of the findings to contemporary financial management research within the healthcare sector [16].

## 3. Result and Discussion

The descriptive statistics in Table 2 summarize the distribution of the study variables across 60 firm-year observations (2020–2024). Next Statistics Descriptive on Table 2.

Table 2. Statistics Descriptive

| Variabel | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| Company | 60 | 6.5 | 3.481184 | 1 | 12 |
| Year | 60 | 2022 | 1.426148 | 2020 | 2024 |
| X1 | 60 | .4791593 | .3717536 | .1122854 | 2.238182 |
| X2 | 60 | 9.798078 | 9.624053 | .1703089 | 38.3831 |
| X3 | 60 | 7.016602 | 4.482675 | 1.619044 | 21.64116 |
| X4 | 60 | 21.54354 | 6.157634 | 14.61843 | 31.01303 |
| Z | 60 | .9630636 | .3878165 | .1031594 | 2.386893 |
| Y | 60 | .156309 | .2131508 | .0148616 | 1.303619 |

This study aims to analyze the effect of capital structure, sales growth, cash turnover, and firm size on profitability, with operational efficiency as a mediating variable, in healthcare industry companies listed on the Indonesia Stock Exchange (IDX) during the 2020-2024 period. Based on the descriptive analysis table of 60 panel data observations, the average profitability, proxied by Return on Assets (ROA) is 0.1563. This indicates that, on average, companies are able to generate profits of approximately 15.63% of their total assets, reflecting a reasonably efficient use of assets to create earnings. Meanwhile, the average capital structure value of 0.4792 suggests that nearly 47.9% of the companies' assets are financed by debt, showing a moderate level of leverage usage. The mean sales growth of 9.7981 indicates that the healthcare firms generally experienced positive annual sales growth, although with considerable variation across companies. The average cash turnover of 7.0166 times per year illustrates efficient liquidity management in supporting operational activities. Firm size, measured by the natural logarithm of total assets, averages at 21.5435, implying that most healthcare firms in the sample are medium to large in scale. Lastly, the mean operational efficiency value of 0.9631 demonstrates a relatively effective management of operating expenses in generating revenues. Data Analysis and Classical Assumtion Testing. Before conducting the regression analysis, a series of model selection tests and classical assumption tests were performed to ensure the model's adequacy and validity. Next Model Selection Results on Table 3.

Table 3. Model Selection Results

| Model Analysis | Model Selection Test | |
|---|---|---|
| | Chow Test | Hauman Test |
| Model I | Prob > F = 0.0000 < 0,05 | Prob > Chi2 = 0.0156 > 0,05 |
| Model II | Prob > F = 0.0000 < 0,05 | Prob > Chi2 = 0.16661 > 0,05 |

The results of the Chow Test indicated a probability value of 0.000 < 0.05 for both equations, suggesting that the Fixed Effect Model (FEM) was the most appropriate specification. Furthermore, the Hausman Test produced a probability value of 0.0156 for the Z model and 0.1661 for the Y model, thereby confirming that the Fixed Effect Model (FEM) was the optimal model to be employed in this study. Next Multicolinearity Test on Table 4.

Table 4. Multicolinearity Test

| Multicollinearity | | | |
|---|---|---|---|
| Model I | | Model II | |
| Variable | VIF | Variable | VIF |
| X1 | 3.59 | X1 | 3.59 |
| X2 | 1.71 | X2 | 1.95 |
| X3 | 4.12 | X3 | 4.52 |
| X4 | 3.20 | X4 | 5.17 |
| | | Z | 5.99 |
| Mean VIF | 3.15 | Mean VIF | 4.24 |

Table 5.Heteroscedasticity Test

| Model Analysis | Heterocedasticity |
|---|---|
| Model I | Prob > Chi2 = 0.0000 < 0,05 |
| Model II | Prob > Chi2 = 0.0000 < 0,05 |

Classical assumption testing, which included assessments of multicollinearity and heteroscedasticity, was also conducted. The correlation coefficients among the independent variables were all below 0.80, and the average Variance Inflation Factor (VIF) values ranged from 3.15 to 4.24 (<10), indicating the absence of multicollinearity issues. However, the Breusch-Pagan/Cook–Weisberg test for heteroscedasticity yielded a probability value below 0.05, implying the presence of heteroscedasticity within the model. Consequently, the panel regression analysis was re-estimated using robust standard errors to obtain more reliable and unbiased coefficient estimates. Regression Analysis (with Fixed Effect Model). Model I: Determinants on Operational Efficienct. The regression analysis was conducted using the Fixed Effect Model to examine the influence of capital structure, sales growth, cash turnover, and firm size on profitability. The following table 6 presents the estimated coefficients, significance levels, and the direction of each variable's effect within Model I. Next Regression Analys for Model I (with Fixed Effect Model) on Table 6.

Table 6. Regression Analys for Model I (with Fixed Effect Model)

| Variable | (β) | Significance (5%) | Effect |
|---|---|---|---|
| X1 Capital Structure (DER) | -0,5049 | 0,010 < 0,05 | Negative Significant |
| X2 Sales Growth | -0,0022 | 0,418 > 0,05 | Not Significant |
| X3 Cash Turnover | -0,0036 | 0,319 > 0,05 | Not Significant |
| X4 Firm Size | -0,01619 | 0,000 < 0,05 | Negative Significant |

The regression analysis results presented in Table 6, which examine the effect of financial variables on operational efficiency (TATO), indicate that capital structure (DER) and firm size have a significant negative influence on firms' efficiency levels. Specifically, the coefficient for DER is –0.5049 (p = 0.010 < 0.05), implying that higher leverage reduces a firm's ability to utilize its assets efficiently due to increased financial obligations and interest expenses. This finding aligns with the Pecking Order Theory [17], which posits that firms prefer internal financing to avoid the costs associated with financial distress and information asymmetry. The use of debt, therefore, tends to constrain managerial flexibility and reduce operational efficiency. Similarly, firm size exhibits a coefficient of –0.1619 (p = 0.000 < 0.05), suggesting that larger firms may face lower operational efficiency due to bureaucratic complexities and diseconomies of scale. In contrast, sales growth (–0.0022, p = 0.418 > 0.05) and cash turnover (–0.0036, p = 0.319 > 0.05) show negative but insignificant effects, indicating that short-term fluctuations in sales and cash management do not substantially influence operational efficiency. Overall, these findings suggest that financial leverage and firm size are the dominant factors affecting operational efficiency among healthcare firms, whereas variations in sales and liquidity play a relatively minor role.

Model II: Determinants of Profitability with Mediation. The following table presents the results of the regression analysis for Model II, which employs the Fixed Effect Model (FEM) approach. This model aims to examine the influence of capital structure, sales growth, cash turnover, and firm size on profitability, with operational efficiency included as a mediating variable. The coefficients, significance levels, and the direction of each variable's effect are summarized in Table 7 below.

Table 7. Regression Analys for Model II (with Fixed Effect Model)

| Variable | (β) | Significance (5%) | Effect |
|---|---|---|---|
| X1 Capital Structure (DER) | -0,3106 | 0,134 > 0,05 | Negative Not Significant |
| X2 Sales Growth | -0,0039 | 0,407 > 0,05 | Not Significant |
| X3 Cash Turnover | -0,0122 | 0,314 > 0,05 | Not Significant |
| X4 Firm Size | -0,2891 | 0,0000 < 0,05 | Negative Significant |
| Z Operational Efficiency | -0,3815 | 0,0009 < 0,05 | Negative Significant |

The results of the second regression model indicate that capital structure (DER) exerts a negative effect on profitability. however, this relationship is statistically insignificant (p = 0.134 > 0.05). This finding is consistent with the Pecking Order Theory, which posits that firms relying on internal financing tend to achieve higher profitability by avoiding the interest expenses and financial risks associated with external debt. In contrast, the regression results presented in Model II (Table 7) suggest that higher leverage significantly reduces profitability, implying that excessive debt can constrain financial performance through increased financing costs. Firm size consistently shows a negative and significant impact on profitability (coefficient = -0.2891; p < 0.01), indicating that larger healthcare firms may experience diseconomies of scale and elevated operational and managerial costs that diminish returns. Moreover, operational efficiency (TATO) also demonstrates a negative and significant effect, suggesting that greater asset utilization in this context does not necessarily enhance profitability-likely due to high operating expenses typical of the healthcare sector. Meanwhile, both sales growth and cash turnover exhibit negative but insignificant effects (p = 0.407 and 0.314, respectively), signifying that revenue expansion and liquidity management alone are insufficient to improve profitability without effective cost control and operational efficiency.

Sobel Test (The Mediating Effect of Operational Efficiency in Determining Profitability. To assess whether operational efficiency serves as a mediating variable in the relationship between financial determinants and profitability, a Sobel test was conducted. This test evaluates the significance of the indirect effect of each independent variable on profitability through operational efficiency. The results of the Sobel test for mediation effects are presented in Table 8 below.

Table 8. Sobel Test for Mediation Effect

| Variable | Test Statistic (Z) | p-value (5%) | Effect |
|---|---|---|---|
| X1 Capital Structure (DER) | 2,2049 | 0,027 < 0,05 | Positive Indirect-Mediated |
| X2 Sales Growth | 0,8127 | 0,416 > 0,05 | Unmediated |
| X3 Cash Turnover | 0,9903 | 0,322 > 0,05 | Unmediated |
| X4 Firm Size | 3,0877 | 0,002 < 0,05 | Positive Indirect-Mediated |

The analysis reveals that operational efficiency (Z) exerts a negative and significant effect on profitability (coefficient = -0.3815; p = 0.0009 < 0.05), suggesting that higher operational burden ratios correspond to lower profitability levels. This underscores the importance of maintaining efficiency as a key determinant of financial performance in healthcare companies. To further examine the mechanism, a Sobel test was conducted to assess whether operational efficiency mediates the relationship between financial variables and profitability. The results indicate a mixed outcome. Capital structure (DER) exhibits a significant mediating effect (Z = 2.20, p = 0.027 < 0.05), implying that leverage influences profitability indirectly through efficiency improvements. Likewise, firm size shows a

strong positive mediation effect (Z = 3.09, p = 0.002 < 0.05), confirming that larger firms can enhance profitability when assets are utilized effectively. Conversely, sales growth (Z = 0.81, p = 0.416 > 0.05) and cash turnover (Z = 0.99, p = 0.322 > 0.05) do not demonstrate significant mediation effects, indicating that their influence on profitability operates largely through direct pathways rather than through operational efficiency.

Hypothesis Results (T-tests). The purpose of the *t*-test is to examine the partial effect of each independent variable on the dependent variable. This study employs a 5% significance level, where the probability value (p-value) is compared to the threshold of α = 0.05 to determine statistical significance. If the p-value is less than 0.05, the independent variable is considered to have a significant effect on the dependent variable. otherwise, the effect is deemed insignificant. In this research context, the *t*-test is used to evaluate how capital structure (X1), sales growth (X2), cash turnover (X3), and firm size (X4) influence profitability (Y), both directly and indirectly, through the mediating variable of operational efficiency (Z). Furthermore, the test assesses the extent to which operational efficiency strengthens or weakens the relationships between the independent variables and firm profitability. The results of the *t*-test are presented as follows on Table 9.

Table 9. Conlusion of the Hypothesis Results (T-test)

| Hypothesis | (β) | P > t | Effect Analys | Sig. | The Resutls |
|---|---|---|---|---|---|
| $H_1$ | -0,5049 | 0,010 < 0,05 | Negative Significant | Significant Effect | Accepted |
| $H_2$ | -0,0022 | 0,418 > 0,05 | Not Significant | Significant Effect | Rejected |
| $H_3$ | -0,0036 | 0,319 > 0,05 | Not Significant | Significant Effect | Rejected |
| $H_4$ | -0,01619 | 0,000 < 0,05 | Negative Significant | Significant Effect | Accepted |
| $H_5$ | -0,3106 | 0,134 > 0,05 | Negative Not Significant | Significant Effect | Rejected |
| $H_6$ | -0,0039 | 0,407 > 0,05 | Not Significant | Significant Effect | Rejected |
| $H_7$ | -0,0122 | 0,314 > 0,05 | Not Significant | Significant Effect | Rejected |
| $H_8$ | -0,2891 | 0,0000 < 0,05 | Negative Significant | Significant Effect | Accepted |
| $H_9$ | -0,3815 | 0,0009 < 0,05 | Negative Significant | Significant Positive Effect | Rejected |
| $H_{10}$ | 2,2049 | 0,027 < 0,05 | Positive Indirect-Mediated | Positive Indirect-Mediated | Accepted |
| $H_{11}$ | 0,8127 | 0,416 > 0,05 | Unmediated | Significant Positive Indirect-Mediated | Rejected |
| $H_{12}$ | 0,9903 | 0,322 > 0,05 | Unmediated | Significant Positive Indirect-Mediated | Rejected |
| $H_{13}$ | 3,0877 | 0,002 < 0,05 | Positive Indirect-Mediated | Positive Indirect-Mediated | Accepted |

Table 9 presents the results of the hypothesis testing, showing the coefficients, significance levels (p-values), and their corresponding interpretations. Based on the t-test results, several hypotheses were found to have significant effects, while others were not supported statistically. Specifically, H1, H4, H8, H9, H10, and H13 demonstrate significant relationships, as indicated by p-values below 0.05. Among these, H1, H4, H8, and H9 reveal negative and significant effects, implying that increases in the respective independent variables lead to declines in profitability or performance indicators. Meanwhile, H10 and H13 show positive indirect effects, suggesting that operational efficiency mediates the relationship between capital structure and firm size with profitability. In contrast, H2, H3, H5, H6, H7, H11, and H12 exhibit non-significant effects (p > 0.05), meaning their proposed relationships were not empirically supported. Overall, these findings indicate that only certain financial and operational factors particularly capital structure, firm size, and operational efficiency play a meaningful role in influencing profitability, either directly or indirectly through mediating mechanisms.

The F-statistical test in this study was applied to examine the simultaneous influence of independent variables on the profitability of healthcare companies. This test determines whether capital structure, sales growth, cash turnover, firm size, and operational efficiency collectively have a significant impact on profitability. Therefore, the probability value from the F-test serves as the basis for assessing the overall strength of the relationship between the independent and dependent variables in this research. Next F-test Results on Table 10.

Table 10. F-test Results

| Model Analysis | F-tests |
|---|---|
| Model I | Prob > F = 0.0000 < 0,05 |
| Model II | Prob > F = 0.0000 < 0,05 |

The F-test results presented on Table 10 indicate significant simultaneous effects among the variables. In Model I the F-statistic shows a probability value of 0.0000 < 0.05, confirming that capital structure (X1), sales growth (X2), cash turnover (X3), and firm size (X4) jointly have a significant influence on operational efficiency (Z) in healthcare industry companies. Similarly, the F-test result in model II (prob > F = 0.0000 < 0.05) demonstrates that capital structure, sales growth, cash turnover, firm size, and operational efficiency collectively exert a significant impact on profitability (Y). These findings suggest that the independent variables together explain substantial variations in both operational efficiency and profitability within the healthcare sector in Indonesia. Coefficient of Determination ($R^2$). The contribution of independent variables to the dependent variable can be assessed using the coefficient of determination ($R^2$) on Table 11.

Table 11. Coefficient of Determinant ($R^2$) results

| Model Analysis | Coefficient of Determination ($R^2$) |
|---|---|
| Model I | 0.3448 |
| Model II | 0.5489 |

For regression model I on Table 11, the within $R^2$ was 0.3448, indicating that capital structure (X1), sales growth (X2), cash turnover (X3), and firm size (X4)

collectively explain 34.48% of the variation in operational efficiency in healthcare companies, while the remaining 65.52% is attributed to factors outside the model. This suggests that, although the simultaneous effect is significant, the relationship strength is moderate due to external influences. For regression model II on Table 11, the within $R^2$ was 0.5489, showing that X1–X4 along with operational efficiency (Z) explain 54.89% of the variation in profitability (Y), with 45.11% accounted for by other variables not included in the model. Therefore, this model demonstrates a relatively strong explanatory power, as more than half of profitability variation is captured by the tested independent variables.

The findings of this study indicate that capital structure has a negative and significant effect on operational efficiency, with a regression coefficient of –0.05049 and a significance level of 0.010 < 0.05. This result demonstrates that the higher the proportion of debt in the capital structure, the lower the company's operational efficiency. This is consistent with the Pecking Order Theory, which posits that the use of debt creates fixed interest obligations that reduce managerial flexibility in allocating resources for operational activities. In the healthcare industry, high interest expenses can diminish the company's ability to control treatment costs, maintain medical equipment, and compensate skilled medical professionals. This finding aligns with the conclusions of [18] [19], who argue that high leverage suppresses operational efficiency. Therefore, for healthcare companies in Indonesia, a debt-dominated capital structure tends to weaken efficiency, as part of the cash flow must be allocated to meet financial obligations rather than to support core operational activities.

In contrast, sales growth does not have a significant effect on operational efficiency, with a regression coefficient of –0.0022 and a significance level of 0.418 > 0.05. Theoretically, an increase in sales should enhance internal financing through retained earnings and thereby improve operational flexibility, as stated by the Pecking Order Theory. However, in the healthcare industry, sales growth does not necessarily correspond to improved efficiency because a large portion of revenues is absorbed by fixed operational costs such as patient hospitalization, pharmaceutical procurement, and maintenance of costly medical equipment. This creates a condition in which revenue increases without a corresponding reduction in cost intensity. This finding is consistent with [20], who argued that unproductive asset utilization coupled with high fixed costs creates an illusion of performance in which revenue rises while profit margins decline.

The regression results further reveal that cash turnover does not significantly affect operational efficiency, with a coefficient of –0.0036 and a significance value of 0.319 > 0.05. Conceptually, a high cash turnover should strengthen a firm's ability to finance operations internally without external debt. However, in practice within the healthcare sector, rapid cash turnover does not necessarily improve efficiency, as most cash resources are allocated to routine operational expenditures such as salaries for medical personnel, procurement of medicines, and maintenance of medical devices. Furthermore, delays in BPJS and insurance claim processing often impede cash realization, reducing the role of cash turnover in enhancing efficiency. Although statistically insignificant, descriptive data show that healthcare firms rotate cash approximately seven times per year, which reflects sound liquidity management. This observation supports the findings of [21] though it contrasts with [22], who argued that higher liquidity, reflected in faster cash turnover, enables firms to manage operational costs more efficiently.

Firm size also exhibits a significant negative effect on operational efficiency, with a coefficient of –0.1619 and a significance level of 0.000 < 0.05. This suggests that the larger the scale of assets, the lower the operational efficiency achieved. While Pecking Order Theory suggests that larger firms have greater access to external financing, such access can lead to overexpansion and bureaucratic complexity that ultimately reduce efficiency. In the healthcare industry, larger organizations face greater coordination demands and higher fixed costs, which often result in cost inefficiencies and administrative rigidity. These results contradict those of [23], who found that medium- to large-sized firms can enhance operational efficiency by leveraging digitalization and reducing fixed costs.

Regarding profitability, the regression analysis indicates that capital structure has a negative but statistically insignificant effect on profitability, with a coefficient of –0.3106 and a significance value of 0.134 > 0.05. This implies that higher leverage does not significantly decrease profitability. In line with Pecking Order Theory, firms are expected to prioritize internal financing to preserve profitability. Nevertheless, in capital-intensive industries such as healthcare, firms rely heavily on external financing for long-term investments in facilities and medical equipment, making short-term effects on profits relatively small. These findings differ from those of [24] [25], who reported that higher leverage levels lead to lower profitability in healthcare institutions.

Sales growth also has no significant impact on profitability, with a coefficient of –0.0039 and a significance level of 0.407 > 0.05. In theory, rising sales should improve profitability through economies of scale and the generation of internal funds. However, in the healthcare sector, sales growth often coincides with higher service and operational costs that are proportionate to or exceed revenue increases, thus keeping profit margins low. This finding contradicts [17], who claimed that rising sales can enhance profitability through reduced per-unit costs, but it supports [15], who noted that when revenue increases are absorbed by fixed expenses rather than reinvested in productive assets, profitability stagnates.

Similarly, cash turnover has no significant effect on

profitability, with a coefficient of –0.0012 and a significance value of 0.314 > 0.05. Although efficient cash turnover theoretically enhances internal funding and investment potential, the empirical results reveal that liquidity in healthcare firms is largely allocated to operational expenditures, limiting its contribution to profitability. This result contradicts the study of [4], but is consistent with [1], who stated that cash efficiency primarily supports supply chain financing rather than directly increasing profitability.

Firm size has a significant negative effect on profitability, with a coefficient of –0.2891 and a significance level of 0.0000 < 0.05, implying that larger healthcare firms tend to have lower profitability. This may be attributed to complex organizational structures, high fixed costs, and regulatory constraints that reduce profit margins. These results diverge from those of [24] and [20], who argued that larger asset bases lead to more stable and higher profits.

Interestingly, operational efficiency itself exerts a significant negative effect on profitability, with a coefficient of –0.3815 and a significance value of 0.0009 < 0.05, contradicting the initial hypothesis. While efficiency is generally expected to improve profitability by optimizing internal financing, in the healthcare industry, efficiency is often pursued through cost-cutting measures that may reduce service quality and limit revenue potential. The phenomenon of cost stickiness further exacerbates this issue, as fixed costs remain high even when efficiency initiatives are implemented. Descriptive statistics indicate that the average operational efficiency value for healthcare firms is 0.9631, reflecting strong cost management but insufficient to drive profitability gains. These findings oppose those of [22] [23] who found that operational efficiency positively influences profitability.

The Sobel test results confirm that operational efficiency mediates the relationship between capital structure and profitability. A high debt ratio in the capital structure reduces operational efficiency (–0.05049; p = 0.0010), which in turn decreases profitability (–0.3815; p = 0.0009). This finding reinforces the mechanism proposed by Pecking Order Theory, suggesting that dependence on debt increases fixed financial obligations, constrains cost management, and ultimately diminishes profitability. However, operational efficiency does not mediate the relationship between sales growth and profitability due to the insignificant effect of sales growth on efficiency (–0.0022; p = 0.418). Thus, higher sales do not translate into improved profitability through efficiency. This finding contradicts [5] [6], who found that operational efficiency enables firms to transform sales growth into higher profits.

Similarly, operational efficiency fails to mediate the effect of cash turnover on profitability. The insignificant effect of cash turnover on efficiency (–0.0033; p = 0.319) results in an insignificant indirect effect on profitability. Although high cash turnover theoretically strengthens internal financing, in practice, healthcare firms use liquidity primarily for daily operational needs. Delays in BPJS and insurance claim settlements further disrupt cash flow, preventing efficiency gains. These findings contradict [8], who argued that efficient cash cycles and asset utilization jointly enhance profitability through improved operational efficiency.

Finally, firm size negatively affects operational efficiency (–0.1619; p = 0.0000), and efficiency negatively affects profitability (–0.3815; p = 0.0009), confirming that larger firms experience lower efficiency, which consequently reduces profitability. In line with the Pecking Order Theory, larger firms' greater access to external financing often increases fixed costs and organizational complexity, leading to reduced cost efficiency and profit margins. This finding supports [25], who demonstrated that firm size indirectly affects profitability through operational efficiency, as larger firms incur higher fixed costs that necessitate efficiency initiatives to preserve profitability.

## 4. Conclusion

This research concludes that the financial and operational dynamics of healthcare companies in Indonesia are strongly shaped by capital structure and firm size, while sales growth and cash turnover exhibit minimal influence on both operational efficiency and profitability. The findings confirm that a higher debt ratio (DER) significantly reduces operational efficiency and indirectly diminishes profitability through this mediating effect. Similarly, larger firms demonstrate lower efficiency and profitability due to increased bureaucratic complexity, fixed costs, and managerial rigidity, suggesting diseconomies of scale within the healthcare sector. These results extend the pecking order theory by illustrating that, in capital-intensive and service-oriented industries such as healthcare, financial leverage and firm expansion may erode managerial flexibility and resource optimization. Therefore, efficient operational management does not automatically translate into higher profitability when constrained by structural and cost rigidities inherent in the industry. Future research should address the limitations of this study by incorporating additional mediating or moderating variables such as cost management practices, corporate governance mechanisms, or service quality indicators to better capture the multidimensional pathways between financial structure and profitability. Methodologically, expanding the sample size beyond twelve listed healthcare firms and lengthening the observation period would enhance generalizability. Furthermore, future studies may employ dynamic panel data approaches or structural equation modeling (SEM) to capture long-term causality and complex interrelations among variables. For practitioners and investors, these findings highlight the importance of maintaining a balanced capital structure, minimizing bureaucratic inefficiencies, and adopting digitalized operational systems to sustain profitability without compromising

service quality.

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