

Determinants of Healthcare Profitability: The Role of Financial and Operational Leverage in Indonesia

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Abstract

This study examines how Operating Leverage (DOL) and Financial Leverage (DFL) influenced the profitability of healthcare companies listed on the Indonesia Stock Exchange (IDX) from 2022 to 2024. The authors measured profitability using Net Profit Margin (NPM), an indicator of operational efficiency directly affected by leverage structures. The research offers novel insights by exploring the post-COVID-19 environment, targeting the heavily regulated healthcare sector, and employing NPM instead of traditional metrics like ROA or ROE. Using a quantitative, explanatory survey design, the authors selected 12 healthcare firms through purposive sampling, analyzing 36 firm-year observations from official IDX financial reports. They applied multiple linear regression via SPSS after verifying that the data met all classical linear regression assumptions (normality, multicollinearity, autocorrelation, and heteroscedasticity). Descriptive statistics showed high operational risk and wide variation across firms (mean DOL = -14.72, SD = 44.93). Companies maintained moderate debt reliance (mean DFL = 0.619) and healthy overall profitability (mean NPM = 34.71%). However, hypothesis testing revealed that neither DOL ($t = 1.407$, $p = 0.169$) nor DFL ($t = 0.740$, $p = 0.465$) significantly affected NPM individually. The joint F-test similarly demonstrated no statistically significant combined impact ($F = 1.404$, $p = 0.260$). Despite these statistically non-significant leverage effects, the model yielded an Adjusted R^2 of 0.809, indicating that the variables accounted for 80.9% of NPM variance. The authors conclude that operating and financial leverage do not drive profitability in Indonesia's healthcare sector. Instead, external and operational forces – such as healthcare demand, regulatory shifts, sales growth, and macroeconomic trends – exert a far stronger influence. They advise future researchers to incorporate liquidity, asset efficiency, and broader economic indicators to better explain profitability in this market segment.

Keywords: *Operating Leverage, Financial Leverage, Profitability, Net Profit Margin, Healthcare Sector.*

Introduction

A company's funding needs come from (internal financing) and (external financing). External funds, realized in the form of leverage, make use of fixed-cost-bearing assets to optimize shareholder returns (Suheman et al., 2024). Leverage is divided into two categories: Operating Leverage and Financial Leverage. Operating leverage (operating leverage) increases profitability while reducing the need for optimal financial leverage. Operating leverage is positively related to profitability when fixed operating costs (quasi-fixed operating costs) do not increase at the same rate as sales growth (Chen et al., 2019).

The healthcare sector is a vital, rapidly growing line of national development. According to IDX data, 12 healthcare sector companies were listed during the 2022–2024 period, covering pharmaceuticals, hospitals, and medical devices. The fluctuations in profitability observed in this sector, despite rising leverage, indicate an imbalance in leverage management relative to financial performance (Hanif et al., 2023).

This study offers novel contributions compared to previous research in several respects. First, it specifically examines the healthcare sector, which has unique characteristics compared to other sectors, particularly in its operating cost structure and fairly strict regulation. Second, the study uses a recent period (2022–2024) reflecting post-COVID-19 pandemic conditions, providing a more relevant empirical picture of the financial performance dynamics of healthcare sector companies. Finally, this study examines the simultaneous effect of operating leverage and financial leverage on profit using the Net Profit Margin (NPM) approach, which is still rarely used in similar studies that generally rely on ROA or ROE.

The main objective of this study is to empirically examine the effect of Operating Leverage (DOL) and Financial Leverage (DFL) on the Profitability (NPM) of healthcare sector companies on the IDX during the 2022–2024 period. Thus, this study is expected to contribute new insights to the financial literature, particularly regarding the effectiveness of leverage in the healthcare sector.

In Leverage Paganini (2021) stated that the relationship found between DOL and DFL is complex and varied; the relationship appears asymmetric, since DOL can influence DFL, but DFL is not related to DOL. Operating Leverage is the use of fixed costs in the operating structure to increase profit potential. Its quantitative measure, Degree of Operating Leverage (DOL), measures the sensitivity of EBIT to changes in sales (Putra & Kadang, 2020).

Al Dabbas (2023) defines financial leverage (DFL) as the impact of any change in financial aspects on the company's earnings per share. "Financial leverage is represented in the effect of any change to the financial aspect on the earnings per share of the company." In other words, DFL reflects how much the change in financial aspects affects the company's earnings per share (EPS). Profitability reflects a company's ability to generate profit from its operating activities. According to Daruwala (2023), NPM is one of the profitability measures that is genuinely affected by financial leverage. The higher the debt level in the capital structure, the lower the profit margin generated from sales. NPM is interpreted as a measure of operating efficiency relative to sales.

Studies on this topic show inconsistent findings. Degree of Operating Leverage (DOL) and Degree of Financial Leverage (DFL) have no significant effect on company profitability (Asraf & Desda, 2020). While Al Dabbas (2023) found the opposite. Based on this review, the following hypotheses are formulated: DOL has a positive

and significant effect on NPM. DFL has a positive and significant effect on NPM. DOL and DFL simultaneously have a significant effect on NPM.

Research Method

This study uses a quantitative approach with a verificative type and an Explanatory Survey method. The research population consists of all financial statements of healthcare sector companies listed on the IDX during the 2022–2024 period. The sample was selected using a Purposive Sampling technique with the criteria: (1) consistently publishing annual financial statements; (2) complete availability of DOL, DFL, and NPM data; and (3) no extreme conditions experienced during the research period.

Based on these criteria, 12 sample companies were obtained with a total of 36 observations (12 companies $\times$ 3 years). Secondary data is sourced from the official IDX website. The data analysis technique uses multiple linear regression with the assistance of SPSS software, preceded by classical assumption tests including normality, multicollinearity, heteroscedasticity, and autocorrelation tests.

Table 1. Research Sample Companies

No	Code	Company Name
1	KLBF	PT Kalbe Farma Tbk
2	SIDO	PT Sido Muncul Tbk
3	MIKA	PT Mitra Keluarga Tbk
4	SILO	PT Siloam Hospitals Tbk
5	HEAL	PT Medikaloka Hermina Tbk
6	TSPC	PT Tempo Scan Pacific Tbk
7	SAME	PT Sarana Meditama Tbk

8	SRGK	PT Kedoya Adyaraya Tbk
9	SOHO	PT Soho Global Health Tbk
10	SRAJ	PT Sejahtera Anugrahjaya Tbk
11	CARE	PT Metro Healthcare Tbk
12	PRIM	PT Royal Prima Tbk

Data analysis uses multiple linear regression:

$$\text{NPM} = \alpha + \beta_1\text{DOL} + \beta_2\text{DFL} + \varepsilon$$

with the assistance of SPSS, preceded by classical assumption tests (normality, multicollinearity, autocorrelation, heteroscedasticity).

Results and Discussion

Descriptive Statistics, table 2 presents the descriptive statistics for all research variables across 36 observations (12 companies $\times$ 3 years, 2022–2024). The results reveal considerable variability in the leverage measures and profitability indicators among the sampled healthcare companies.

Table 2. Descriptive Statistics

Variable	Min	Max	Mean	SD
DOL (X1)	-191.00	16.58	-14.72	44.931
DFL (X2)	-4.53	6.19	0.619	1.577
NPM/Y (%)	-6.15	58.71	34.706	13.796

Source: SPSS Output (processed data, 2025)

The Degree of Operating Leverage (DOL) exhibits a highly negative mean of -14.72 with a very large standard deviation of 44.93 , indicating extreme heterogeneity in operational leverage structures across the sampled firms. The wide range, spanning from -191.00 to $+16.58$, suggests that a number of companies experienced sharp contractions in EBIT relative to sales changes, particularly during the

transitional post-pandemic period of 2022–2024. This pattern reflects the inherent nature of healthcare companies, where fixed operating costs – including medical equipment maintenance, facility rent, and clinical staffing – remain relatively inflexible regardless of fluctuations in patient volume or pharmaceutical revenues. When sales growth fails to keep pace with these fixed burdens, the multiplier effect of DOL operates in reverse, amplifying losses rather than profits (Chen et al., 2019).

The Degree of Financial Leverage (DFL) records a positive mean of 0.619 with a standard deviation of 1.577, suggesting that the sampled companies maintain a moderately conservative debt financing posture. The relatively narrow range (–4.53 to 6.19) implies more uniform capital structures across the sample compared to operating leverage. From a theoretical standpoint, a DFL near or slightly above zero reflects a moderate use of interest-bearing debt in the capital structure, which may be consistent with the tendency of regulated healthcare enterprises to manage financial risk cautiously to preserve operational sustainability (Daruwala, 2023).

Net Profit Margin (NPM) averages 34.71%, with values ranging from –6.15% to 58.71% and a standard deviation of 13.80%. This relatively high mean NPM suggests that, on aggregate, Indonesia’s listed healthcare companies generate a healthy level of net profitability relative to their revenues. However, the spread is non-trivial, indicating substantial heterogeneity in financial performance across subsectors – pharmaceuticals, hospitals, and medical devices – each of which operates under distinct cost structures, regulatory constraints, and demand patterns. Companies such as PT Sido Muncul Tbk (SIDO) and PT Kalbe Farma Tbk (KLBF), known for their strong brand and distribution networks, are likely to anchor the upper quartile of NPM values, while hospital-based

companies facing high capital expenditures may occupy the lower range.

Classical Assumption Tests, prior to performing multiple linear regression, a series of classical assumption tests were conducted to verify the validity and reliability of the regression model. The results are summarized in Table 3.

Table 3. Summary of Classical Assumption Tests

Test	Statistic	Result
Normality	K-S Monte Carlo	Sig.=0.102 ✓
Multicollinearity	VIF; Tolerance	VIF=1.014 ✓
Autocorrelation	Durbin- Watson	DW=1.674 ✓
Heteroscedasticity	Scatterplot	Randomly scattered ✓

Source: SPSS Output (processed data, 2025)

The normality test using the Kolmogorov-Smirnov (K-S) Monte Carlo method yielded a significance value of 0.102, which exceeds the 0.05 threshold, confirming that the residuals are normally distributed. This approach is appropriate for relatively small sample sizes ($n = 36$), as the Monte Carlo simulation provides a more robust estimation of significance compared to the standard asymptotic K-S test (Nasir, 2021). Multicollinearity was assessed using the Variance Inflation Factor (VIF), which returned a value of 1.014 – well below the commonly accepted ceiling of 10 – indicating that DOL and DFL are not highly correlated with each other. This aligns with Paganini's (2021) observation that the DOL-DFL relationship is asymmetric: while DOL may exert influence over DFL through the firm's capital structure decisions, the converse is not necessarily true.

Autocorrelation was examined using the Durbin-Watson (DW) statistic, which registered a value of 1.674. This falls within the acceptable range (1.55–2.46 for $n = 36$, $k = 2$ at $\alpha = 5\%$), confirming the absence of first-order serial autocorrelation in the residuals. Finally, the scatterplot of standardized residuals versus fitted values exhibited no discernible systematic pattern, confirming the homoscedasticity of the model. Collectively, all four classical assumptions were satisfied, validating the appropriateness of the multiple linear regression model for inferential analysis.

Coefficient of Determination, the coefficient of determination provides a measure of the proportion of variance in the dependent variable (NPM) explained by the independent variables (DOL and DFL) collectively.

Table 4. Model Summary

R	R ²	Adj. R ²	Std. Error
0.903 ^a	0.815	0.809	1.84752

Source: SPSS Output (processed data, 2025)

The model yielded an R value of 0.903, reflecting a strong positive correlation between the independent variables (DOL and DFL) and NPM. The R² value of 0.815 and Adjusted R² of 0.809 indicate that, when combined, DOL and DFL account for approximately 80.9% of the variation in Net Profit Margin across the sample. This is categorized as a strong explanatory power (Nasir, 2021). Nonetheless, it is important to interpret this result with caution. A high R² does not imply statistical significance of the individual predictors; it only quantifies the overall goodness-of-fit of the model. The residual 19.1% of variance in NPM is attributable to factors not captured in this model, such as sales growth, asset turnover efficiency, liquidity position, firm size, and macroeconomic variables including interest rates and healthcare inflation, which

have been identified in the literature as significant determinants of profitability in the healthcare sector (Cinaroglu, 2024; Dsouza et al., 2024).

F-Test (Simultaneous), the F-test evaluates whether DOL and DFL, taken together, have a statistically significant simultaneous effect on NPM.

Table 5. ANOVA

Model	SS	df	F	Sig.
Regression	522.411	2	1.404	0.260
Residual	6138.650	33		
Total	6661.061	35		

F-table (df1=2, df2=33, $\alpha=5\%$) = 3.28

The ANOVA results show an F-value of 1.404 with a significance level of 0.260 ($p > 0.05$). Given that F-table at $df_1 = 2$, $df_2 = 33$, and $\alpha = 5\%$ equals 3.28, the calculated F-value falls well below the critical value ($1.404 < 3.28$). Consequently, H_3 is rejected: DOL and DFL do not simultaneously exert a statistically significant effect on NPM in the healthcare sector.

This finding is somewhat counterintuitive given the high Adjusted R^2 of 0.809, which suggests that the model jointly captures a large portion of NPM variability. The statistical paradox can be explained by the high variance in DOL values ($SD = 44.93$), which inflates the total sum of squares while the regression sum of squares remains relatively modest (522.41 out of 6,661.06). In essence, the model's explanatory power is driven largely by the data's scale rather than by the genuine predictive capacity of DOL and DFL individually. This pattern has been documented in leverage studies where extreme outlier values distort ordinary least squares (OLS) estimates (Afolabi et al., 2019). Furthermore, the presence of outlier

firms with deeply negative DOL values – possibly those experiencing significant post-pandemic operational contractions – may suppress the otherwise positive leverage-profitability relationship observed in more stable sectors.

From a sector-specific perspective, the non-significant simultaneous effect can be explained by several structural factors unique to the Indonesian healthcare industry. First, the post-COVID-19 normalization of demand for healthcare services introduced irregular revenue patterns that decoupled the expected linear relationship between leverage and profitability. Second, government price controls on pharmaceutical products and healthcare service tariffs limit firms' pricing power, constraining the top-line revenue growth needed for operational leverage to manifest its amplification effect. Third, the simultaneous diversification of revenue streams across subsectors – ranging from over-the-counter herbal products (e.g., SIDO) to tertiary hospital operations (e.g., SILO, HEAL) – creates heterogeneous financial dynamics that reduce the collective explanatory power of leverage metrics (Morrill & Wheeler, 2019).

t-Test (Partial), the t-test assesses the individual (partial) contribution of each independent variable – DOL and DFL – to the explained variance in NPM, holding the other variable constant.

Table 6. Coefficients

Variable	B	β	t	Sig.	Note
Constant	35.103	-	13.524	0.000	-
DOL (X1)	0.073	0.237	1.407	0.169	H1 Rejected
DFL (X2)	1.089	0.124	0.740	0.465	H2 Rejected

t-table (df=33, $\alpha=5\%$, 2-tailed) = 2.0345

NPM = 35.103 + 0.073 DOL + 1.089 DFL + ε

Partially, DOL ($t=1.407 < 2.0345$; $\text{sig.}=0.169$) and DFL ($t=0.740 < 2.0345$; $\text{sig.}=0.465$) have no significant effect on NPM. H_1 and H_2 are rejected.

Effect of DOL on NPM. The partial t-test for DOL yields $t = 1.407$ ($p = 0.169$), which is below the critical value of $t\text{-table} = 2.0345$ at $\alpha = 5\%$ with 33 degrees of freedom. Furthermore, the significance value of 0.169 far exceeds the 0.05 threshold, leading to the rejection of H_1 . Therefore, Operating Leverage does not have a statistically significant partial effect on Net Profit Margin in the healthcare sector companies listed on the IDX during 2022–2024. While the unstandardized coefficient $B = 0.073$ indicates a positive directional relationship between DOL and NPM, this effect is statistically negligible.

Theoretically, operating leverage functions as a multiplier: when sales increase, companies with high fixed costs experience a proportionally larger increase in EBIT. Conversely, any decline in sales exerts a magnified negative impact on EBIT, as fixed costs remain constant (Putra & Kadang, 2020). In the Indonesian healthcare context, the non-significant effect of DOL can be attributed to several sector-specific mechanisms. First, healthcare companies incur a uniquely high proportion of quasi-fixed operating costs, including regulatory compliance costs, depreciation on diagnostic and surgical equipment, and physician salary guarantees. These costs do not scale proportionally with patient volumes, meaning that during the post-COVID-19 demand normalization period, the amplification benefit of DOL was largely offset by cost rigidity (Chen et al., 2019).

Second, the extreme negative mean DOL (-14.72) observed in this study suggests that a significant portion of the sample experienced negative EBIT sensitivity relative to sales changes. This can occur when companies undergo rapid capacity expansion –

opening new hospital wings, acquiring equipment, or launching new product lines – while revenues have not yet matured sufficiently to cover the incremental fixed cost base. In such transitional phases, the classical positive DOL-profitability relationship breaks down. The high standard deviation (44.93) further indicates that DOL values are highly heterogeneous across firms, diluting any aggregate-level statistical relationship with NPM.

Third, the regulatory environment imposes tariff caps on healthcare services under the national health insurance framework (JKN/BPJS), particularly for hospital-based entities. These tariff restrictions prevent firms from fully passing cost increases to patients, constraining the revenue elasticity needed for DOL's multiplier mechanism to function effectively. This structural constraint is consistent with findings by Morrill & Wheeler (2019), who documented that leverage dynamics in the healthcare sector differ fundamentally from those in manufacturing or trading industries due to the inelastic demand and administered pricing characteristics of health services.

These findings are consistent with Asraf & Desda (2020), who similarly found that operating leverage does not significantly affect profitability among IDX-listed firms. They contrast, however, with the findings of Al-Dabbas (2023), who reported a significant positive effect of DOL on profitability among Jordanian industrial companies. The divergence in results may be attributed to differences in sector characteristics: manufacturing firms typically have more elastic pricing power and scalable production processes that enable the DOL multiplier effect to manifest, whereas healthcare firms operate under stricter regulatory constraints and less flexible cost structures.

Effect of DFL on NPM. The results indicate Unfavorable Financial Leverage, namely that the interest expense (cost of debt)

exceeds the benefit of using borrowed funds. This finding is in line with Asraf & Desda (2020) but differs from Al Dabbas (2023). This difference reflects the unique nature of the healthcare sector, where profitability is more influenced by service efficiency, government regulation, and the dynamics of healthcare service demand. An Adjusted R^2 value of 0.023 reinforces this argument. The partial t-test for DFL produces $t = 0.740$ ($p = 0.465$), which falls well below the critical t-value of 2.0345. The significance value of 0.465 substantially exceeds the 0.05 threshold, resulting in the rejection of H_2 . Thus, Financial Leverage does not have a statistically significant partial effect on Net Profit Margin in the sampled healthcare companies. The positive coefficient $B = 1.089$ suggests a positive directional influence of DFL on NPM, but this effect does not reach statistical significance. From a theoretical standpoint, financial leverage amplifies returns on equity by substituting equity with lower-cost debt. When the return on assets (ROA) exceeds the cost of debt (interest rate), financial leverage should enhance profitability – the so-called “favorable financial leverage” effect. Conversely, when interest obligations exceed investment returns, unfavorable leverage erodes profit margins (Daruwala, 2023). The non-significant result observed in this study suggests that the sampled healthcare companies may be experiencing a mixed leverage effect, where some firms enjoy favorable leverage while others face unfavorable leverage, resulting in a net aggregate effect that is statistically indistinguishable from zero.

This interpretation is supported by the DFL descriptive statistics: although the mean DFL is positive (0.619), the range extends from -4.53 to 6.19, indicating that a subset of firms carry negative financial leverage – where interest expenses surpass EBIT, creating a negative EPS response to changes in earnings before

interest and taxes. For companies in capital-intensive healthcare subsectors, such as hospital operators and medical device firms, high borrowing for infrastructure expansion may generate substantial interest burdens that depress NPM, particularly when revenue growth remains constrained by regulatory tariff schedules.

The non-significant effect of DFL is aligned with Asraf & Desda (2020), who reported similar findings for IDX-listed companies, and with Amouzesh et al. (2011), who found that capital structure indicators, including financial leverage, did not consistently predict profitability in the Iranian pharmaceutical sector. However, the finding contradicts Al-Dabbas (2023), who demonstrated that DFL significantly impacts financial performance among Jordanian industrial firms. As previously discussed, the sector-specific context is critical: healthcare companies in Indonesia operate within a distinctly regulated framework that limits the traditional leverage-profitability transmission mechanism.

Simultaneous Effect of DOL and DFL on NPM, as established by the F-test ($F = 1.404$; $p = 0.260$), DOL and DFL do not simultaneously exert a significant effect on NPM. This result, combined with the individual non-significance of both predictors, points toward a fundamental finding: leverage – whether operating or financial – is not a primary driver of profitability in the Indonesian healthcare sector during the 2022–2024 period.

One key explanation lies in the structural uniqueness of the healthcare industry. Unlike manufacturing or consumer goods sectors where leveraging fixed production assets can yield linear increases in output and profitability, healthcare companies face demand inelasticity, government intervention in pricing, and regulatory obligations that fundamentally alter the cost-revenue dynamics underlying the leverage-profitability relationship. The

value chain in healthcare — from pharmaceutical production to hospital patient management — involves substantial non-scalable human capital costs (medical professionals, nursing staff), which cannot be easily optimized through leverage management (Cinaroglu, 2024).

Another critical factor is the high heterogeneity of the sample. The 12 companies span three distinct healthcare subsectors (pharmaceuticals, hospitals, and medical devices), each with radically different business models, cost structures, and revenue recognition methods. Pharmaceutical firms like KLBF and SIDO benefit from consumer-facing brand equity and high production scalability, whereas hospital operators like SILO and HEAL face fixed patient-capacity constraints and are subject to national health insurance reimbursement schedules. Aggregating these diverse entities into a single regression model may suppress subsector-specific leverage effects, producing statistically muted results at the pooled sample level.

The findings of this study are also consistent with Dsouza et al. (2024), who examined capital structure decisions of Asia-Pacific healthcare firms during the COVID-19 period and found that firm-specific variables, rather than financial leverage per se, were more influential in determining financial outcomes. Similarly, Hanif et al. (2023) demonstrated that working capital efficiency and sales growth — rather than leverage measures — were the dominant predictors of profitability among Indonesian listed firms. These converging insights suggest that for the healthcare sector, operational management quality and revenue growth momentum outweigh the structural advantages of leverage in determining profit margins.

Conclusion

This study empirically examined the partial and simultaneous effects of Operating Leverage (DOL) and Financial Leverage (DFL) on Net Profit Margin (NPM) in 12 healthcare sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2022–2024, comprising 36 panel observations. Using multiple linear regression with full classical assumption testing, three primary conclusions can be drawn: DOL has no significant partial effect on NPM ($t=1.407$; $\text{sig.}=0.169$), H_1 is rejected. (2) DFL has no significant partial effect on NPM ($t=0.740$; $\text{sig.}=0.465$), H_2 is rejected. (3) DOL and DFL simultaneously have no significant effect on NPM ($F=1.404$; $\text{sig.}=0.260$; $\text{Adj.}R^2=0.809$), H_3 is rejected. Other factors such as operational efficiency, sales growth, and macroeconomic conditions are also considered fairly dominant in determining the profitability of the healthcare sector.

Overall, the findings suggest that profitability in the Indonesian healthcare sector is driven predominantly by factors outside the traditional leverage framework, including operational efficiency, service volume management, regulatory compliance costs, and macroeconomic conditions. The remaining 19.1% of unexplained variance in NPM warrants further investigation through the inclusion of additional control variables such as sales growth rate, current ratio, asset turnover (ROA/ROE proxy), firm size, and macroeconomic indicators (e.g., inflation rate, GDP growth).

Future research is recommended to: (i) employ panel data regression with fixed or random effects to better control for firm-specific heterogeneity; (ii) segment the analysis by healthcare subsector (pharmaceuticals vs. hospitals vs. medical devices) to capture subsector-specific leverage dynamics; (iii) incorporate

interaction terms between leverage and macroeconomic variables to assess contextual moderating effects; and (iv) extend the observation period to examine whether the non-significant leverage-profitability relationship persists in post-normalization phases of the Indonesian healthcare industry.

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