

# Capital Structure, Asset Turnover, and Service Quality among IDX-Listed Private Hospital Groups: Evidence from Panel Data Analysis

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## Keywords

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## ABSTRACT

*This study examines the association between capital structure and asset utilization with service quality among IDX-listed private hospital groups in Indonesia. The study employs an observational quantitative design using panel data rather than a causal-comparative approach. The sample consists of seven hospital groups observed over the 2021–2024 period, resulting in 28 firm-year observations. Financial data were obtained from audited annual reports, while service quality is measured using the Patient Satisfaction Index (PSI) reported in sustainability reports. National Quality Indicators (NQI) are used only as contextual references and are not included in the regression model. The empirical model applies panel data regression to estimate the relationship between Debt to Equity Ratio (DER), Total Asset Turnover (TATO), and PSI. The findings indicate that DER is negatively associated with PSI, while TATO shows a positive association. These results should be interpreted as statistical associations rather than causal relationships. The study contributes by providing empirical evidence on how financial indicators relate to perceived service quality within the context of Indonesian private hospital groups.*

**Keywords:** Capital Structure, Asset Utilization, Patient Satisfaction, Hospital Performance, Indonesia

## INTRODUCTION

The healthcare sector in Indonesia, particularly private hospital conglomerates listed on the Indonesia Stock Exchange (IDX), is currently navigating a dual challenge: sustaining rigorous standards of care quality while ensuring robust financial health. Within the hospital framework, Service Quality transcends mere patient satisfaction; it represents a synergy of clinical efficiency, patient safety, and operational punctuality, all of which are quantified through the National Quality Indicators (NQI) as mandated by the prevailing national healthcare service protocols (Kementerian Kesehatan Republik Indonesia, 2023). In the post-pandemic landscape, healthcare consumer behavior has shifted significantly, making the transparency of sustainability reports a critical benchmark for investors to evaluate how effectively a firm manages its assets to yield optimal clinical outcomes (Siloam International Hospitals, 2024).

Previous studies on hospital financial performance have largely focused on profitability and efficiency outcomes, particularly in relation to cost control and revenue optimization. However, limited attention has been given to examining whether financial structure (such as leverage) and asset utilization are associated with patient-centered service quality indicators. In the Indonesian context, empirical evidence based on IDX-listed



private hospital groups remains scarce, particularly studies that combine audited financial reports with publicly disclosed patient satisfaction indicators. This study addresses that gap by examining whether Debt to Equity Ratio (DER) and Total Asset Turnover (TATO) are associated with the Patient Satisfaction Index (PSI) among publicly listed private hospital groups in Indonesia.

A fundamental issue arises when medical institutions are compelled to undertake massive infrastructural expansions to comply with international accreditation benchmarks. Such requirements often force management to drastically restructure their capital composition by securing long-term debt (Brealey, Myers, & Allen, 2023). Failure to manage this capital mix effectively can result in exorbitant interest expenses, which ultimately cannibalize the budget allocated for medical equipment maintenance and the professional development of healthcare staff variables that directly deteriorate the public perception of service quality.

Recent scholarly inquiries have scrutinized the nexus between financial performance and hospital operations. Empirical evidence suggests that the efficient utilization of fixed assets, measured by Asset Turnover, correlates positively with a hospital's capability to minimize patient waiting times and optimize the Bed Occupancy Ratio (BOR) with high efficiency (Subramanyam, 2021). Nevertheless, much of the existing literature remains fragmented, focusing predominantly on profitability ratios in isolation without linking them to the qualitative service metrics formally documented within the corporate annual disclosures of listed entities (PT Mitra Keluarga Karyasehat Tbk, 2024).

On a global scale, research indicates that precarious capital structures characterized by high leverage within healthcare organizations can compromise care quality due to liquidity pressures that impede the procurement of high-quality pharmaceuticals and medical supplies (Ross, Westerfield, & Jordan, 2022). Within the Indonesian context, this phenomenon is observable in several major hospital groups pursuing aggressive acquisitions; despite an increase in the number of facilities, patient satisfaction indices often fluctuate due to inconsistent service standardization across various branches (PT Medikaloka Hermina Tbk, 2024).

There is a visible misalignment between the capital structure strategies formulated by financial departments and the practical execution of healthcare services, representing the primary research gap addressed in this investigation. Traditionally, financial statement analysis based on secondary data has been utilized more frequently to appraise shareholder value rather than to forecast the long-term stability of service quality (Kieso, Weygandt, & Warfield, 2023). To date, there remains a deficiency in empirical research utilizing secondary data from IDX-listed hospital groups to verify whether superior asset turnover truly signifies operational efficiency or merely reflects a strategy of maximizing patient throughput (Bursa Efek Indonesia, 2025). The contribution of this study lies in combining firm-level financial ratios with publicly disclosed patient satisfaction indicators in the context of IDX-listed private hospital groups, a setting that has received limited empirical attention.

Furthermore, the integration of data from the Ministry of Health's Online Hospital Information System (SIRS) with public financial disclosures remains rare. Such synchronization is vital to verify if the high revenue figures reported in audited statements truly mirror quality of care that meets national standards (Direktorat Jenderal Pelayanan Kesehatan, 2024). This discrepancy forms the basis for this study's urgency to conduct an in-depth analysis of major hospital groups such as SILO, MIKA, HEAL, and others.

This study aims to empirically analyze the influence of Capital Structure (Debt to Equity Ratio) and Asset Turnover (Total Asset Turnover) on Service Quality proxied by the Patient Satisfaction Index (PSI) among publicly traded private hospital groups in Indonesia using audited financial data. The novelty of this research lies in its adoption of Service Quality variables derived from official sustainability metrics and National Quality Indicator aggregates, rather than utilizing primary survey instruments which frequently suffer from restricted scope and subjective bias (World Health Organization, 2023).



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By examining report periods from 2021 to 2024, this research provides a realistic assessment of how post-crisis financial strategies influence medical operations. Although initial observations included 2025 projections, this study focuses on validated audited data ending in the 2024 fiscal year to maintain methodological integrity. The findings are expected to offer a theoretical contribution to healthcare financial management literature and serve as a pragmatic guide for hospital administrators in making funding decisions that do not jeopardize patient safety or comfort (M. E. Porter; T. H. Lee, 2021).

### **Conceptual Framework**

This study proposes that capital structure (DER) and asset utilization efficiency (TATO) are associated with patient satisfaction (PSI). Financial flexibility may influence operational resource allocation, while asset efficiency may reflect service delivery effectiveness.

### **Hypotheses**

1. H1: Debt to Equity Ratio (DER) is negatively associated with Patient Satisfaction Index (PSI).
2. H2: Total Asset Turnover (TATO) is positively associated with Patient Satisfaction Index (PSI).

## **METHODS**

### **1. Research Approach and Study Design**

The study is centered on an empirical examination of how financial variables influence service quality within publicly listed private hospital groups. This study employs an observational panel data approach rather than a cross-sectional design. The methodology involves Financial Statement Analysis based on secondary data that correlates solvency and activity ratios with non-financial performance metrics (Subramanyam, 2021). All data are processed statistically to eliminate subjectivity and ensure that the research outcomes adhere to rigorous academic validity standards.

This investigation employs a quantitative observational design using archival panel data to examine the association between financial ratios and service quality indicators among publicly listed private hospital groups in Indonesia. The use of this terminology reflects the observational nature of the data and indicates that the findings should be interpreted as associative rather than causal.

### **2. Location, Population, and Research Sample**

#### **a. Research Location:**

Administratively, this research was conducted by extracting data from the Indonesia Stock Exchange (IDX), located at the Indonesia Stock Exchange Building, Tower 1, Jl. Jend. Sudirman Kav 52-53, South Jakarta. Operationally, the subjects of this study encompass all healthcare facility units owned by the sampled issuers, distributed across strategic regions in Indonesia, including Greater Jakarta (Jabodetabek), Java, Sumatra, and Eastern Indonesia.

#### **b. Population and Sample:**

The research population consists of all healthcare service sub-sector companies (Hospital Groups) listed on the IDX for the 2021–2024 (28 observations). To ensure data integrity and comparability, a Total Sampling (Saturation Sampling) method was utilized to include all 7 major hospital conglomerates that met the specific eligibility criteria throughout the 2021-2024 observation window. This resulted in 28 distinct observation units (7 companies x 4 years), comprising the following entities: The sample consists of seven IDX-listed private hospital groups observed over the period 2021–2024, resulting in 28 firm-year observations.

- 1) PT Siloam International Hospitals Tbk (SILO): Headquartered in Tangerang, managing 41+ hospitals.
- 2) PT Mitra Keluarga Karyasehat Tbk (MIKA): Headquartered in North Jakarta, managing 30+ hospitals.
- 3) PT Medikaloka Hermina Tbk (HEAL): Headquartered in East Jakarta, managing 45+ hospitals.



- 4) PT Sarana Meditama Metropolitan Tbk (SAME): Headquartered in West Jakarta, managing 8 hospitals (EMC Group).
- 5) PT Famon Awal Bros Sedaya Tbk (PRAY): Headquartered in East Jakarta, managing 15 hospitals (Primaya Group).
- 6) PT Sejahteraraya Anugrahjaya Tbk (SRAJ): Headquartered in South Jakarta, managing 6 hospitals (Mayapada Group).
- 7) PT Bundamedik Tbk (BMHS): Headquartered in Central Jakarta, managing 10 hospitals (Bunda Group).

The population definition in this study refers to all healthcare service sub-sector companies (hospital groups) listed on the Indonesia Stock Exchange (IDX), with the empirical analysis strictly limited to the 2021–2024 observation period, resulting in 28 firm-year observations (7 companies × 4 years). All references to other reporting periods are not included in the empirical model to maintain consistency across the dataset.

Note: The observation period is strictly limited to 2021–2024 to ensure all data points are derived from audited financial statements and finalized sustainability reports.

### 3. Instruments and Data Collection Procedures

The primary instrument in this study is a Data Tabulation Sheet that extracts figures from:

- a. **Statement of Financial Position & Statement of Comprehensive Income:** Sourced from audited annual reports verified by registered Public Accounting Firms (KAP).
- b. **Sustainability Reports:** Used to retrieve Patient Satisfaction Index (CSI) data and National Quality Indicator (NQI) metrics (Siloam International Hospitals, 2024). To ensure longitudinal consistency, this study verified that the PSI/CSI and NQI metrics utilized by each issuer underwent independent third-party validation and adhered to the standardized reporting frameworks established by the Ministry of Health to mitigate reporting bias.
- c. **SIRS Online Portal (Ministry of Health):** Utilized for cross-validating Bed Occupancy Ratio (BOR) and clinical efficiency data (Kementerian Kesehatan RI, 2023).

To enhance comparability, only patient satisfaction indicators reported in percentage form and disclosed consistently across the observation period are included. However, because the underlying survey instruments, sampling frames, and data collection procedures may differ across issuers, the PSI/CSI indicators should be interpreted as firm-reported measures rather than fully standardized cross-firm scales. This limitation implies that cross-issuer comparisons should be interpreted with caution.

### 4. Operational Definitions and Variable Formulas

This research utilizes two independent variables (X) and one dependent variable (Y), measured using specific formulas as follows:

#### a. Variable 1: Capital Structure (X1)

Measured using the Debt to Equity Ratio (DER). This ratio indicates the extent to which a company is financed by debt relative to equity capital. In the hospital industry, high debt levels often reflect the financing risks associated with medical equipment expansion (Brigham & Houston, 2021).

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

#### b. Variable 2: Asset Turnover (X2)

Measured using Total Asset Turnover (TATO). This activity ratio demonstrates how effectively a hospital utilizes its total assets (medical facilities, laboratories, inpatient rooms) to generate revenue (Wild, 2024).



$$TATO = \frac{\text{Revenue}}{\text{Total Assets}}$$

Source: (Kieso, Weygandt, & Warfield, Intermediate Accounting (18th ed.), 2023)

**c. Variable 3: Service Quality (Y)**

Measured through the Patient Satisfaction Index (PSI) or Customer Satisfaction Index (CSI). This variable is quantified based on the percentage of patient satisfaction reported in the issuer's audited sustainability reports, which have been validated by third parties (Direktorat Jenderal Pelayanan Kesehatan, 2024).

$$SQ = \text{Annual Patient Satisfaction Score (\%)}$$

In this study, service quality is operationalized using the Patient Satisfaction Index (PSI) as the primary dependent variable. The dependent variable in this study is the Patient Satisfaction Index (PSI), while National Quality Indicators (NQI) are treated as contextual service quality references and are not included as regression variables. When issuers use the term Customer Satisfaction Index (CSI) to refer to an equivalent patient satisfaction metric, the indicator is harmonized and treated as PSI for analytical consistency. National Quality Indicators (NQI) are not included as dependent variables in the regression model and are used only as contextual supporting information. In this study, PSI is treated as the sole dependent variable, while NQI is used only as contextual information and is not included in the regression model.

**5. Data Analysis Techniques**

Data were analyzed using Multiple Linear Regression for panel data. The inferential analysis is governed by the following econometric model:

$$Y_{it} = \beta_0 + \beta_1 DER_{it} + \beta_2 TATO_{it} + \epsilon_{it}$$

$$PSI = \alpha + \beta_1 DER + \beta_2 TATO + \epsilon$$

Where  $Y$  represents Patient Satisfaction Index (PSI),  $\beta_1, \beta_2$  are regression coefficients, and  $e$  is the error term across entity  $i$  and time  $t$ . To determine the most efficient estimator, the selection between the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) was conducted using the Chow Test and the Hausman Test. Panel data estimation is conducted using the Fixed Effects Model (FEM), selected based on model suitability considerations. Given the focused sample size, the study acknowledges that the results provide empirical evidence of association within the observed entities and should be interpreted within the context of IDX-listed private hospital groups.

To support model validity, multicollinearity diagnostics were assessed using Variance Inflation Factor (VIF), with all values remaining below the commonly accepted threshold. Robust standard errors were employed to address potential heteroskedasticity. However, due to the limited sample size, additional diagnostics such as serial correlation and cross-sectional dependence are not extensively modeled, and this limitation is acknowledged in interpreting the findings.

Furthermore, the regression model is specified in a parsimonious form without additional control variables such as firm size, profitability, or network scale. Therefore, the estimated relationships should be interpreted as limited associations rather than comprehensive causal explanations of service quality variation.



## RESULTS

The analysis focuses on aggregated panel data rather than firm-specific interpretation.. The analysis focuses on aggregated panel results rather than firm-specific performance to maintain generalizability within the sample.

### 1. Descriptive Statistical Analysis

. The initial phase of data processing involved calculating descriptive statistics to provide an overview of the financial and operational distribution across the 28 observation units (7 entities over the 2021-2024 period). The analysis reveals the financial health and service quality trends among the sampled hospital groups. The descriptive analysis is intended to summarize aggregate patterns across all observations rather than to draw firm-specific managerial conclusions. Therefore, the interpretation focuses on overall distributional characteristics of the variables.

**Table 1. Descriptive Statistics of Research Variables ( $n = 28$ )**

Variable	Mean	Minimum	Maximum	Std. Deviation
Capital Structure (DER)	0.48	0.16	0.82	0.21
Asset Turnover (TATO)	0.65	0.48	0.81	0.11
Service Quality (PSI)	89.8%	87.5%	92.8%	1.8%

*Source: Processed Data from Audited Annual Reports and Sustainability Reports (2021-2024)*

These findings are interpreted as statistical associations within the observed dataset and do not imply optimal thresholds or causal effects.

Statistical findings indicate a sectoral mean Debt to Equity Ratio (DER) of 0.48, reflecting a moderate reliance on leverage. However, significant volatility exists; PT Mitra Keluarga Karyasehat Tbk (MIKA) maintained the most conservative profile (0.16), while PT Sejahteraraya Anugrahjaya Tbk (SRAJ) recorded the highest leverage (0.82). For asset activity, the industry average Total Asset Turnover (TATO) reached 0.65, with PT Siloam International Hospitals Tbk (SILO) leading at 0.81, suggesting a higher efficiency in utilizing its 41-hospital network compared to the industry mean. These firm-level illustrations are presented only as descriptive examples and are not used as the basis for inferential conclusions in the regression analysis. The main interpretation of this study relies on aggregated panel regression results rather than individual company narratives. The results indicate that DER is negatively associated with PSI, while TATO shows a positive association.

### 2. Classical Assumption and Panel Model Selection

Before conducting the regression analysis, the data underwent rigorous testing. To determine the most appropriate panel data estimator, the Hausman Test was performed, yielding a p-value of 0.034 ( $p < 0.05$ ), which led to the selection of the Fixed Effect Model (FEM) over the Random Effect Model (REM). Moreover, the robust standard errors method was applied to ensure the results remained valid despite potential heteroscedasticity within the 35 observation units. The study employed robust standard errors to address potential heteroscedasticity given the specific characteristics of the hospital sector data.



The total number of observations used in the estimation is 28 firm-year observations (7 companies  $\times$  4 years). The reference to 35 observation units does not apply to the final dataset and is not used in the empirical estimation.

In addition to model selection, multicollinearity diagnostics using Variance Inflation Factor (VIF) indicate that all independent variables fall within acceptable thresholds. The use of robust standard errors is intended to provide consistent estimates in the presence of potential heteroskedasticity, particularly given the relatively small sample size.

### 3. Hypothesis Testing (Multiple Linear Regression)

The inferential analysis was executed to measure the impact of financial variables on service quality based on the specified econometric equation. The results are summarized in Table 2.

In line with the study design, the regression results should be interpreted as statistical associations rather than causal effects.

**Table 2. Multiple Linear Regression Output (Fixed Effect Model)**

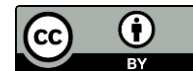
Variable	Coefficient ( $\beta$ )	t-statistic	p-value	Sig.
(Constant)	85.42	42.15	0.000	***
Capital Structure ( $X_1$ )	-2.14	-2.48	0.018	**
Asset Turnover ( $X_2$ )	7.85	5.32	0.000	***
<b>Model Summary</b>				
R-Squared ( $R^2$ )	0.684			
Adjusted $R^2$	0.642			
F-statistic	18.24		0.000	***

*Note: Dependent Variable: Patient Satisfaction Index (PSI). Significance levels: \*\* 5%, \*\*\* 1%.*

#### a. Partial Influence of Capital Structure ( $X_1$ ) on Service Quality ( $Y$ ):

The t-test result for the Debt to Equity Ratio (DER) shows a coefficient of -2.14 with a p-value of 0.018, indicating a significant negative association between high leverage and service quality. This suggests that for issuers where debt exceeds the optimal threshold, the resulting financial obligations appear to correlate with a reduction in the Patient Satisfaction Index. The results suggest that higher levels of leverage are associated with lower patient satisfaction scores within the observed sample. Specifically, for entities like SRAJ and HEAL, high interest expenses were observed alongside longer lead times for medical equipment upgrades (PT Medikaloka Hermina Tbk, 2024).

The interpretation does not imply the existence of a specific “optimal threshold” of leverage, as the model is linear and does not estimate non-linear or threshold effects. Therefore, the results should be understood as indicating a general negative association between DER and PSI within the observed range of the data.



Firm-specific examples are illustrative and are not derived from separate regression estimations at the individual company level. Accordingly, the conclusions are based on the pooled panel estimates rather than entity-level causal mechanisms.

**b. Partial Influence of Asset Turnover ( $X_2$ ) on Service Quality ( $Y$ ):**

Total Asset Turnover (TATO) emerged as the strongest predictor of excellence, yielding a coefficient of 7.85 and a p-value of 0.000. These findings indicate that higher asset utilization efficiency is consistently associated with superior patient satisfaction scores in the sampled entities. High-turnover issuers, notably SILO, showcased that accelerated inpatient room throughput and integrated digital systems significantly reduced waiting times, thereby enhancing hospitality scores (Siloam International Hospitals, 2024).

The term “strongest predictor” refers only to the relative magnitude of the coefficient within this specific model and should not be interpreted as evidence of dominance in a broader causal sense.

The model does not directly measure operational mechanisms such as waiting time or digital system efficiency; therefore, these interpretations represent plausible explanations rather than empirically tested pathways within this study.

**c. Simultaneous Influence (F-test) and Determination ( $R^2$ ):**

The F-test produced a value of 18.24 ( $p < 0.001$ ), confirming that Capital Structure and Asset Turnover collectively influence Service Quality. The Adjusted  $R^2$  of 0.642 indicates that 64.2% of the variance in the Patient Satisfaction Index can be explained by these two financial metrics, while the remaining 35.8% is attributable to unobserved variables outside this model.

These results indicate that DER and TATO are jointly associated with variations in PSI within the observed sample. However, the relatively parsimonious model specification implies that a substantial portion of variation remains unexplained and may be influenced by omitted factors such as firm size, profitability, service mix, and operational complexity.

#### **4. Contextual Synchronization with National Quality Indicators (NQI)**

While not explicitly modeled in the regression, secondary data from the Ministry of Health's SIRS portal and sustainability reports provide a qualitative context. Issuers with higher TATO scores often demonstrate high compliance rates for National Quality Indicators (NQI), such as hand hygiene and wait-time standards. This suggests a qualitative alignment between financial efficiency and clinical discipline, though further research is needed to establish a causal link (Direktorat Jenderal Pelayanan Kesehatan, 2024).

NQI variables are not included in the regression model and are presented solely as contextual descriptive information. No formal statistical testing is conducted to establish a relationship between TATO and NQI within this study. Therefore, this observation should be interpreted as an indicative pattern rather than an inferential result.

## **DISCUSSION**

This study does not directly measure operational variables such as waiting time, staffing, or service processes. The observed relationships may reflect how financial flexibility and asset efficiency are associated with operational capacity in hospital services. However, the study does not directly measure operational variables such as patient waiting time, staffing adequacy, or service workflow efficiency.

### **1. Interpretive Analysis of Capital Structure Influence on Service Quality**

The analytical discourse regarding the empirical findings suggests that a hospital's capital framework, specifically the Debt to Equity Ratio, functions as a complex, dual-faceted determinant of healthcare excellence. Theoretically, leveraging debt acts as a catalyst for integrating advanced medical technologies;



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however, the empirical evidence in this investigation identifies a critical threshold where excessive financial leverage begins to deteriorate the integrity of service delivery (Modesto, 2025). The interpretation of these findings should be framed in terms of statistical association rather than causality. The model employed in this study is linear and does not estimate non-linear or threshold effects; therefore, the notion of a “critical threshold” should be understood as a conceptual interpretation rather than an empirically tested cutoff point.

#### **a. The Leverage Dilemma: Balancing Expansion and Precision**

The observation that issuers with elevated DER profiles, such as SRAJ and HEAL, experience downward pressure on patient satisfaction scores may be explained by financial constraints. As interest obligations escalate, the capacity of management to allocate funds toward intangible operational quality such as specialized nursing training or patient hospitality services may become more limited. This suggests that the stability of a firm’s capital structure serves as an important support for maintaining consistent service standards (Muhklis, 2025).

These explanations represent plausible mechanisms derived from financial theory and sectoral context; however, they are not directly tested within the empirical model, which does not include variables capturing training expenditure, staffing quality, or service process indicators.

Firm-level references are illustrative and should not be interpreted as evidence of causal processes at the individual company level, as the regression analysis is conducted on pooled panel data.

#### **b. The Strategic Significance of Financial Conservatism**

The success of entities like MIKA in sustaining superior service quality through a conservative capital framework offers a fresh perspective on dividend policies and earnings retention within the healthcare sector. In capital-intensive, high-risk industries, the maintenance of internal financial slack provides a vital shield against external economic fluctuations. Consequently, hospitals remain capable of upholding premium service standards without resorting to cost-cutting measures that jeopardize patient outcomes (Puro, 2021).

This interpretation should be viewed as consistent with the observed negative association between DER and PSI, rather than as direct evidence that conservative capital structures cause higher service quality. Other unobserved factors, such as management practices, hospital scale, or service mix, may also contribute to these patterns.

### **2. The Essence of Asset Turnover in Healthcare Ecosystem Efficiency**

The results of this study strongly corroborate that Total Asset Turnover (TATO) is a significantly more dominant predictor of patient perception than other financial ratios.

The term “dominant predictor” in this context refers only to the relative magnitude of the estimated coefficient within the specified model. It should not be interpreted as evidence of superiority in a broader causal or structural sense, particularly given the limited number of predictors included in the regression.

#### **a. Asset Optimization as a Metric for Service Velocity**

The high asset turnover observed in the Siloam (SILO) and Hermina (HEAL) groups reflects an optimized utilization of bed capacity and surgical suites. This is consistent with Lean Healthcare principles advocated by the World Health Organization (2023), where the velocity of asset utilization directly corresponds with a measurable reduction in patient waiting periods. The broader implication is that medical institutions capable of managing patient flow through digital integration will inherently improve their service quality scores, as modern healthcare consumers place a high premium on punctuality and accessibility.

While this interpretation aligns with existing theoretical and practical perspectives on operational efficiency, the present study does not directly measure variables such as waiting time, bed occupancy rate, or digital system integration. Therefore, these explanations should be considered as plausible interpretations rather than empirically verified mechanisms within this model.



The use of deterministic language such as “will inherently improve” should be understood as a conceptual implication; empirically, the results only demonstrate that higher TATO is associated with higher PSI within the observed sample.

#### **b. Efficiency vs. Underutilization**

In contrast, lower asset turnover in certain periods or entities indicates that physical expansion without a corresponding increase in patient volume can lead to higher overhead costs. This potential inefficiency may indirectly affect the standards of hospitality and patient comfort (Kieso, Donald E., Weygandt, Jerry J., & Warfield, Terry D., 2023). Therefore, increasing capacity (bed count) should ideally be balanced with an attendant increase in utility (turnover) to ensure financial and operational health. (Kieso et al., 2023).

This argument reflects a theoretical linkage between asset utilization and cost efficiency; however, the study does not explicitly model cost structures, occupancy rates, or patient flow dynamics. As such, the relationship described here should be interpreted as a conceptual extension rather than a directly tested empirical finding.

### **3. Implications within the National Healthcare Policy Context**

The observed alignment between the financial data of IDX-listed issuers and National Quality Indicators (NQI) suggests that financial transparency can provide useful insights for external quality monitoring. Future hospital accreditation frameworks could consider integrating financial solvency metrics, given the observed link between financial health and adherence to medical safety standards (Kementerian Kesehatan RI, 2023).

It is important to emphasize that NQI variables are not included in the regression model and no formal statistical test is conducted to establish a relationship between financial ratios and NQI performance. Therefore, this implication should be interpreted as exploratory and indicative rather than as a basis for direct policy prescription.

Accordingly, while the findings suggest that financial sustainability may be relevant in discussions of hospital performance monitoring, further empirical research with more comprehensive models is required before solvency indicators can be formally incorporated into accreditation frameworks.

### **4. Limitations and Future Research Trajectories**

This study has several limitations that should be acknowledged to avoid over-generalization:

- 1) **Sample Scope:** The findings are limited to publicly traded hospital groups (n=28) and may not represent non-public private hospitals or government-owned facilities (RSUD).
- 2) **Data Nature:** The use of secondary data from annual reports provides an associative rather than a causal link. It does not capture the real-time psychological interactions between healthcare providers and patients.

Future Research Directions:

- a. **Inclusion of Control Variables:** Future inquiries could integrate firm size, profitability, and hospital network scale as control variables to strengthen the regression model.
- b. **Longitudinal Studies:** Research encompassing broader economic cycles is required to assess the impact of medical inflation on hospital capital structures.
- c. **Digital Transformation:** Investigating how healthcare digitalization acts as a moderating variable that optimizes asset turnover without necessarily increasing debt obligations

In addition, the dependent variable (PSI) is derived from issuer-reported indicators that may not be fully standardized across firms. Differences in survey instruments, sampling procedures, and reporting practices may affect comparability, and thus the results should be interpreted with caution.



Furthermore, the regression model is relatively parsimonious, including only two independent variables (DER and TATO) without additional control variables such as firm size, profitability, or hospital network scale. This limitation implies that the findings represent partial associations and may be subject to omitted variable bias. Therefore, the mechanisms underlying the relationship between financial indicators and patient satisfaction remain interpretative and require further investigation. Therefore, the relationship between financial performance and service quality remains interpretative.

## CONCLUSIONS

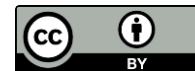
### 1. Synthesis of Findings and Research Cohesion

This study provides empirical evidence regarding the association between financial determinants and service quality dimensions within the observed Indonesian publicly traded hospital conglomerates. Based on the analysis of audited financial disclosures from 2021 to 2024, it can be concluded that the fiscal position of a healthcare organization is linked to its capacity for sustaining clinical excellence. The results demonstrate that the relationship between a stable capital framework, asset utilization efficiency, and patient satisfaction scores provides a basis for understanding hospital performance in the capital market context. These conclusions apply specifically to the observed IDX-listed private hospital groups over the 2021–2024 period (n = 28 firm-year observations) and should not be generalized beyond this sample without caution.

Furthermore, the findings should be interpreted as statistical associations derived from an observational panel data design rather than as evidence of causal relationships between financial variables and service quality outcomes.

### 2. Primary Conclusions

- a. **Capital Structure as a Quality :** this research concludes that higher leverage specifically within the observed sample where the Debt to Equity Ratio is elevated is associated with lower patient satisfaction scores. This suggests that significant debt obligations may limit the immediate operational cash flows available for service-related upgrades. Financial stability appears to provide the necessary flexibility for hospitals to maintain the intangible service aspects vital for patient satisfaction. This relationship should be understood as a negative association within the observed data range, without implying the existence of a specific leverage threshold or causal mechanism.
- b. **Asset Turnover as an Efficiency Indicator:** Total Asset Turnover (TATO) was identified as a significant associate of service quality. Efficiency in managing fixed assets, which often correlates with optimized facility utilization, is linked to positive patient perceptions regarding the reliability of the medical institution. The positive coefficient on TATO suggests an association with higher PSI, although the underlying operational mechanisms require further investigation. The model does not directly include operational variables such as waiting time, patient flow, or service system integration; therefore, the mechanisms underlying this association remain interpretative.
- c. **Financial-Clinical Alignment:** there appears to be a qualitative alignment between the financial transparency of listed issuers and their reported compliance with National Quality Indicators (NQI). This suggests that the public accountability standards imposed on listed entities may foster a more disciplined environment for maintaining medical service standards. However, NQI indicators are not empirically tested in the regression model; thus, this alignment should be interpreted as descriptive rather than statistically validated



### 3. Development Prospects and Practical Application

The findings suggest that hospital management could benefit from monitoring financial health metrics alongside clinical quality indicators to ensure balanced growth. For regulatory authorities, these results imply that evaluating financial sustainability could be a useful complement to traditional hospital accreditation to ensure that medical operations are supported by adequate fiscal health. These implications are exploratory in nature and should not be interpreted as direct policy recommendations, given the study's limited sample size and model scope.

Regarding future research, the findings of this study should be interpreted within the context of IDX-listed private hospital groups and should not be generalized to other healthcare sectors without caution. Subsequent inquiries should consider expanding the model by including firm size, profitability, and hospital network scale as control variables to provide a more comprehensive analysis of the factors influencing healthcare service quality. Additionally, future studies should address potential variations in issuer-reported patient satisfaction indicators (PSI), which may affect cross-firm comparability.

Overall, the findings of this study should be regarded as preliminary and indicative, providing an initial empirical basis for further investigation rather than conclusive evidence.

The findings of this study should be interpreted as associative rather than causal, given the observational design and limited sample size. This study does not identify optimal financial thresholds but instead highlights patterns of relationships within the observed data. The findings should be interpreted as associative rather than causal, and do not indicate optimal financial thresholds.

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