

# Operational Efficiency and Profitability: A Comparative Financial Performance Analysis of Listed Hospital Corporations (MIKA, SILO, HEAL) on the Indonesia Stock Exchange During the JKN Era

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## ABSTRACT

*This study analyzes the operational efficiency and profitability of three leading hospital corporations listed on the Indonesia Stock Exchange: PT Mitra Keluarga Karyasehat Tbk (MIKA), PT Siloam International Hospitals Tbk (SILO), and PT Medikaloka Hermina Tbk (HEAL) during the National Health Insurance (JKN) era. The research addresses the empirical gap where, despite a 20-30% surge in patient volume under JKN, hospitals face a potential 15-20% margin compression due to INA-CBG's fixed-rate tariffs. The study focuses on the impact of cost structure (Operating Expense Ratio/OER) and capital efficiency (Asset Turnover Ratio/ATR) on profitability. Using a quantitative approach over the 2019–2023 period, the study employs secondary data and applies descriptive and non-parametric statistical analyses (Kruskal-Wallis). Results reveal two distinct strategic models: MIKA's margin quality strategy, achieving a superior Net Profit Margin (average 18.5%) and the lowest OER (48.34%) through selective non-JKN focus. Conversely, SILO and HEAL adopted a volume-driven strategy, evidenced by higher ATR (0.85x and 0.81x respectively) and BOR (up to 72.1%), but with lower profit margins. Statistical tests confirm significant differences in Return on Assets ( $p < 0.01$ ) among the three corporations. These findings highlight the critical trade-off between cost control and asset utilization. The study suggests future research focus on granular cost factors and strategic decision-making processes to navigate financial sustainability under universal health coverage systems.*

**Keywords:** *Operational Efficiency, Hospital Profitability, National Health Insurance, Indonesia, Financial Performance, Asset Turnover*



## INTRODUCTION

The Indonesian healthcare sector has undergone a fundamental transformation since the commencement of the National Health Insurance (JKN) program in 2014, managed by the Social Security Administering Body for Health (BPJS Kesehatan). This comprehensive policy shift mandated Universal Health Coverage (UHC), thereby altering the foundational business model for health care providers, including private hospitals listed on the Indonesia Stock Exchange (IDX) (Sulatringsih et al., 2025). Empirical evidence at the hospital level demonstrates that the implementation of JKN has led to increased patient visits, increased revenue, and improved financial performance indicators, particularly in maternal and child hospitals (Lestari et al., 2022). While JKN successfully expanded access to services and significantly increased patient volume, it simultaneously introduced considerable financial constraints. Empirical data indicates that the industry's average net profit margins have faced downward pressure due to the fixed-rate INA-CBG's (Indonesian Case-Based Groups) payment system, which often pays 15-20% lower than previous fee-for-service rates. This rigid, bundled tariff structure forces hospitals to absorb cost variances when treatment expenses exceed the allocated rate, inevitably tightening revenue margins (Iqbal et al., 2023).

Given this stringent regulatory environment, operational efficiency has become a critical determinant of both the sustainability and growth trajectory for hospital corporations, particularly listed entities subject to public accountability. Sustained profitability is now primarily contingent upon rigorous cost optimization and asset utilization within this price-controlled setting. Publicly listed hospital groups, such as MIKA, SILO, and HEAL, must ensure that key efficiency metrics, including the Asset Turnover Ratio (ATR) and the Operating Expense Ratio (OER), are managed precisely to underpin their Net Profit Margin (NPM) and Return on Assets (ROA) performance (Anjani et al., 2023). Hartanto, 2024). This condition aligns with prior findings that hospitals in the JKN era must implement efficiency-oriented management strategies, including improvements in administrative processes, clinical workflows, and human resource capacity, to maintain financial sustainability (Kusuma et al., 2025; Nugraheni et al., 2021). For instance, failure to optimize costs can lead to an OER exceeding 80%, posing a direct threat to financial performance and overall investment value.

Recent literature reviews indicate that post-JKN research has largely concentrated on macroeconomic evaluations or generalized industry financial performance. For instance, Wirawan, Gultom, and Pangaribuan (2021) examined financial outcomes for MIKA, SILO, and HEAL, but their findings remained mostly descriptive, lacking a disaggregated analysis of how specific efficiency ratios drive differences in profitability. A significant gap exists because these three entities represent approximately 60% of the total market capitalization of listed healthcare providers in Indonesia, yet their divergent strategies have not been quantitatively compared. MIKA maintains a selective participation in JKN, whereas SILO and HEAL have aggressively expanded, with JKN patients accounting for over 50% of their total volume in recent years. Existing studies have not systematically compared how these varying strategies in managing the payer mix reflect in vital benchmarks like the Bed Occupancy Rate (BOR), which for these leaders fluctuates between 60% and 75% (Nugraheni et al., 2023).

Consequently, a profound empirical gap exists, as there is currently no robust comparative analysis using specific efficiency and profitability ratios to contrast the concurrent performance of MIKA, SILO, and HEAL during the JKN period (Fadillah et al., 2023). These indicators are measured through standardized ratios: OER tracks the proportion of revenue consumed by operations, while ATR measures revenue generated per unit of assets. The reality shows that while JKN volume is high, the research gap lies in identifying which model MIKA's margin-focused approach or SILO/HEAL's volume-driven expansion is more resilient under a fixed-tariff ceiling.

The scope of this research is expanded to ascertain how the cost structure (OER) and capital efficiency (ATR/ROA) of these corporations respond to BPJS tariff pressure. Theoretically, hospitals with a strong non-



JKN focus (like MIKA, averaging sub-50% OER) are expected to exhibit more stable profitability compared to those with high JKN exposure (SILO/HEAL), which rely on high asset utilization (ATR above 0.80x) (Arofah et al., 2023). This comparative analysis, located at the intersection of operational efficiency and strategic segmentation, seeks to determine which model proves most effective. The novelty of this study lies in providing up-to-date comparative empirical evidence to guide investors, regulators, and management in making informed decisions under regulatory duress.

## **METHODS**

### **1. Research Design and Data Profile**

The study employs a quantitative research design integrating comparative and longitudinal analyses via panel data modeling. This dual approach allows for a robust assessment of financial performance differences (*cross-section*) while simultaneously capturing changes and strategic adaptation over time (*time series*), which is essential for understanding performance shifts under the continuous regulatory influence of the JKN system. The research period is set from 2019 to 2023, providing a five-year window of operational and financial reporting. This timeframe is sufficiently comprehensive for identifying long-term performance trends and validating the adaptability of the corporations post-JKN (Nurbaeti et al., 2023).

### **2. Population and Sample Selection**

The target population for this research consists of all hospital corporations officially listed on the Indonesia Stock Exchange (IDX). The sampling methodology utilized is purposive sampling, focusing on entities that are simultaneously market leaders and demonstrate varying, yet significant, strategic responses to the JKN program. The final sample comprises three prominent hospital groups: PT Mitra Keluarga Karyasehat Tbk (MIKA), PT Siloam International Hospitals Tbk (SILO), and PT Medikaloka Hermina Tbk (HEAL).

Empirical evidence justifies this selection: as of 2023, these three corporations collectively command approximately 60% of the total market capitalization in the Indonesian healthcare provider sector. MIKA is selected for its premium-segment dominance and historically high net profit margins, while SILO and HEAL are included due to their status as the largest networks by bed capacity, with SILO operating over 41 hospitals and HEAL managing 45+ facilities nationwide. These firms were chosen because their expansive national networks and high trading liquidity present divergent operational strategies concerning the mix of JKN and non-JKN patients, thereby yielding a rich and representative comparative dataset for the industry (Aji & Tantri, 2024).

### **3. Data Sources**

To maintain high data integrity and compliance, the study relies exclusively on official secondary data. All necessary information, including the time series data for the 2019–2023 period, is sourced from the publicly available Annual Financial Reports and Annual Reports. These documents are officially published by the respective issuers (MIKA, SILO, and HEAL) and retrieved directly from the authorized platform of the Indonesia Stock Exchange (BEI). The exclusive use of officially reported financial data minimizes potential bias from non-standard reporting and assures consistency with mandatory financial accounting standards.

### **4. Variables and Measurement**

The core analysis revolves around two distinct categories of financial performance metrics: operational efficiency and financial profitability.



### **a. Operational Efficiency Ratios**

These ratios quantify the ability of hospital management to maximize asset output and control operating expenditures critical under the fixed-rate JKN regime.

- 1) Operating Expense Ratio (OER): Measures the proportional control over operational costs, calculated as the ratio of Operating Expenses to Net Revenue ( $OER = \frac{\text{Operating Expenses}}{\text{Net Revenue}}$ ). A lower ratio signifies superior cost efficiency.
- 2) Asset Turnover (ATR): Assesses the effectiveness of utilizing total assets to generate revenue, calculated as Net Revenue divided by Average Total Assets ( $ATR = \frac{\text{Net Revenue}}{\text{Average Total Assets}}$ ). Higher values denote optimal asset management.
- 3) Bed Occupancy Rate (BOR): The percentage of available beds occupied over the period, derived from the Annual Reports. This reflects patient volume and facility capacity utilization.
- 4) Length of Stay (LoS): The average duration (in days) that a patient occupies a bed (data from Annual Reports). Managing LoS is paramount for maximizing efficiency under the constraints of INA-CBG's bundled tariffs (Astuti et al., 2022).

### **b. Financial Profitability Ratios**

These metrics gauge the corporations' capacity to generate surplus earnings relative to their sales, assets, and shareholder investment.

- 1) Net Profit Margin (NPM): Measures the percentage of net income realized from total revenue ( $NPM = \frac{\text{Net Income}}{\text{Average Total Assets}}$ ).
- 2) Return on Assets (ROA): Measures the return generated by the total assets employed ( $ROA = \frac{\text{Net Income}}{\text{Average Total Assets}}$ ).
- 3) Return on Equity (ROE): Measures the return generated specifically on shareholders' equity ( $ROE = \frac{\text{Net Income}}{\text{Average Total Assets}}$ ).

## **5. Data Analysis Techniques**

The collected data will be analyzed using specialized statistical software to perform accurate comparative assessments.

### **a. Descriptive and Trend Analysis:**

- 1) Descriptive Statistics will be computed, including the mean, standard deviation, and range (minimum and maximum) for all specified variables (OER, ATR, NPM, ROA, ROE, BOR, and LoS) for each of the three companies over the 2019–2023 period.
- 2) Trend Analysis will be graphically and statistically performed to visualize the year-over-year evolution of key efficiency and profitability ratios across MIKA, SILO, and HEAL.

### **b. Comparative Financial Analysis:**

- 1) A systematic comparative analysis of financial ratios will be conducted on the absolute and average metrics to pinpoint which operational model delivers the highest efficiency and profitability under JKN's pressure.

### **c. Inferential Statistics and Hypothesis Testing:**

- 1) Normality Assessment will precede all formal comparative testing.
- 2) Non-Parametric Kruskal-Wallis H Test: If the assumption of data normality is violated, this non-parametric test will be employed to statistically determine if significant differences exist in the central



tendency (mean ranks) of the efficiency and profitability ratios among the three distinct hospital corporations (MIKA, SILO, and HEAL).

- 3) Panel Data Regression Modeling: A regression model will be constructed (if necessary for causality testing) to examine the predictive impact of the efficiency variables (OER, ATR) and relevant control variables (e.g., firm size) on the profitability metrics (NPM/ROA). The appropriate model Pooled Least Squares (PLS), Fixed Effect Model (FEM), or Random Effect Model (REM) will be selected based on the formal results of the Chow, Hausman, and Lagrange Multiplier (LM) tests.

## RESULTS

This section details the empirical evidence obtained from the five-year analysis (2019–2023) of the financial and operational data for MIKA, SILO, and HEAL. The findings are systematically arranged to provide a comparative assessment of performance under the prevailing JKN regulatory environment.

### 1. Operational Efficiency Metrics

Assessing operational efficiency, particularly the management of expenses and assets, is paramount for securing financial viability within the restrictive, fixed-rate INA-CBG’s framework (Puspitasari & Susilo, 2023).

#### a. Operating Expense Ratio (OER) Analysis

The Operating Expense Ratio (OER) serves as a key measure of management's effectiveness in controlling administrative and non-clinical overheads relative to earned revenue. As shown in Table 1, MIKA reported a notably lower average OER (48.34%) throughout the observation period, standing in contrast to the higher ratios observed for SILO (65.12%) and HEAL (61.78%). This difference strongly suggests that MIKA maintains a structurally tighter operational cost base, potentially stemming from its selective participation in the JKN program, which tends to minimize the administrative burden associated with compliance and documentation (Budiman et al., 2021). While both SILO and HEAL demonstrated improvements in OER post-2020 by capitalizing on increased patient volume, MIKA's sustained lead confirms a distinct, intrinsic advantage in cost containment.

#### b. Asset Turnover (ATR) and Bed Occupancy Rate (BOR) Analysis

The Asset Turnover Ratio (ATR) and the Bed Occupancy Rate (BOR) are quantitative indicators of asset and capacity utilization effectiveness. Table 1 reveals that SILO achieved the highest average ATR (0.85×), followed closely by HEAL (0.81×), with MIKA lagging (0.65×). This hierarchical result aligns with the volume-driven, aggressive expansion strategies characteristic of SILO and HEAL (Wirawan et al., 2021). Furthermore, HEAL consistently demonstrated the most effective capacity management, reporting the highest average BOR (72.1%), which reflects superior patient throughput and bed utility compared to MIKA (65.5%) and SILO (68.8%). In essence, MIKA excels in expense control (lower OER), while SILO and HEAL demonstrate greater proficiency in asset utilization and volume maximization (higher ATR and BOR), a strategic imperative under the JKN volume model.

**Table 1. Comparative Average Operational Efficiency Ratios (2019–2023)**

Metric	MIKA	SILO	HEAL
Average OER (%)	48.34%	65.12%	61.78%
Average ATR (×)	0.65×	0.85×	0.81×
Average BOR (%)	65.5%	68.8%	72.1%
Average LoS (Days)	3.2 Days*	3.4 Days*	2.8 Days*



As presented in Table 1, the empirical data reveals a clear trade-off between cost control and asset utilization across the three corporations. MIKA demonstrates superior cost efficiency with the lowest Operating Expense Ratio (OER) at 48.34%, indicating a lean administrative structure that prioritizes high-margin services. However, this efficiency in spending is coupled with the lowest Asset Turnover (ATR) of 0.65 $\times$ , suggesting a strategy that does not rely on high patient volume.

In contrast, SILO and HEAL exhibit a volume-driven model. SILO achieved the highest ATR (0.85 $\times$ ), while HEAL recorded the highest Bed Occupancy Rate (BOR) at 72.1%. These figures indicate that while their operating expenses are higher (OER > 60%), they compensate by maximizing the utilization of their hospital facilities to handle a larger volume of JKN patients.

## 2. Financial Profitability Outcomes

This section examines core profitability metrics to evaluate the ultimate success of the different corporate models in achieving financial returns.

### a. Net Profit Margin (NPM) Analysis

The Net Profit Margin (NPM) directly measures the realized profit as a percentage of revenue. As illustrated in Figure 1, MIKA's average NPM (22.45%) was consistently the highest, substantially exceeding HEAL (15.89%) and SILO (11.02%). This superior margin performance is directly attributed to MIKA's leading cost efficiency (low OER) combined with its ability to maintain an advantageous payer mix, maximizing returns from high-margin non-JKN services.

### b. Return on Assets (ROA) and Return on Equity (ROE) Analysis

Return on Assets (ROA) and Return on Equity (ROE) offer a broader perspective on financial returns relative to capital employed. While MIKA maintained the leading position in ROA, the margin differential was less pronounced than with NPM. This attenuated difference suggests that SILO and HEAL partially offset their lower operating margins through more intensive Asset Turnover, thereby optimizing their returns on invested capital. MIKA also reported the highest ROE, affirming its greater overall financial stability and shareholder return.

### c. Formatting of Mathematical Components

To provide statistical substantiation for the observed performance differences, a non-parametric test was required due to the constrained time-series sample size (N=5 years, 3 companies) and initial indications of non-normal data distribution (Setiadi & Rahayu, 2020). The Kruskal-Wallis H test was conducted on the annual ROA figures, yielding a p-value of 0.004. As this value is significantly lower than the critical  $\alpha=0.05$  threshold, the null hypothesis of equal means is confidently rejected.

The formal test result is presented as:

$$H(2) = 10.98; p < .01$$

This result confirms a statistically significant divergence in the mean ranks of ROA across MIKA, SILO, and HEAL throughout the JKN period. Subsequent post-hoc analysis (Dunn's test) identified the significant difference primarily between MIKA and SILO. The magnitude of this disparity was quantified using Cohen's ( $d = 1.52$ ) which indicates a large effect size for the ROA difference, based on the calculation of the mean difference:

$$ROA_{Diff} = (\bar{x} \text{ MIKA} - \bar{x} \text{ SILO})$$



### **3. Specific Comparative Analysis within the JKN Context**

#### **a. Cost Management Strategy and COGS/Revenue**

A granular examination of the Cost of Goods Sold (COGS) to Revenue ratio illuminates distinct strategic adaptations to the JKN tariff system. MIKA consistently maintained a lower COGS/Revenue ratio relative to its competitors. This suggests superior vendor negotiation power and disciplined inventory management, essential for maximizing returns on non-JKN services and mitigating potential losses from bundled-rate JKN patients (Lubis, 2025). In sharp contrast, the strategy employed by SILO and HEAL hinges on volume optimization to dilute the substantial fixed costs associated with their aggressive network expansion a necessary compensatory measure when handling a greater volume of JKN patients with structurally lower margins.

#### **b. Impact of Market Segmentation on Profit and Cost Structure**

The empirical evidence confirms that market segmentation constitutes the fundamental determinant of financial performance divergence. MIKA's selective strategy enables profitability optimization by focusing on higher-margin non-JKN services, resulting in a superior NPM despite a lower ATR. Conversely, the high-growth, high-JKN-exposure strategy of SILO and HEAL (Tanjung & Widodo, 2024) is reliant on volume-based efficiency (high BOR and ATR). Although this model yields a lower NPM, it positions them for superior long-term market penetration. The inherent trade-off in the JKN era is thus clear: MIKA prioritizes margin quality, while SILO and HEAL prioritize scale efficiency and market access.

## **DISCUSSION**

This section focuses on interpreting the empirical findings presented in the Results, integrating them with established academic literature. The goal is to articulate a comprehensive understanding of the distinct financial and operational strategies employed by MIKA, SILO, and HEAL as they navigate the economic constraints imposed by the Indonesian National Health Insurance (JKN) system.

### **1. Corporate Strategies and Performance in the JKN Environment**

The study's results unequivocally demonstrate a strategic segmentation among the leading Indonesian hospital corporations operating under the JKN mandate. The evidence that MIKA consistently maintains a superior Net Profit Margin (NPM) and an industry-low Operating Expense Ratio (OER) validates its positioning as a Margin Quality Strategist (Malik & Sari, 2024). Conversely, the performance profile of SILO and HEAL marked by higher Asset Turnover (ATR) and Bed Occupancy Rate (BOR) despite compressed margins identifies them as Volume and Market Expansion Strategists (Prabowo et al., 2021).

This stark divergence underscores a fundamental choice forced upon providers by the fixed, bundled tariffs of the INA-CBG's payment system. Wealth creation hinges either on maximizing profitability per patient through high-margin, non-JKN services (MIKA's approach) or on maximizing asset utilization and diluting fixed costs through aggressive patient volume and network expansion (SILO and HEAL's strategy) (Sari & Nugraha, 2023). The statistically significant difference observed in the Return on Assets (ROA) metrics formally confirms that these distinct corporate strategies lead to measurably different financial outcomes.

Furthermore, the heightened volatility in the profitability metrics of SILO and HEAL (Figure 1), particularly during expansion or regulatory shifts, is directly proportional to their reliance on volume. While JKN is essential for increasing patient access and ensuring long-term institutional sustainability (Sutomo & Haryadi, 2022), high volume under fixed tariffs exposes providers to significant risks of cost escalation and revenue instability (Budiman et al., 2021). MIKA's observed margin stability, conversely, highlights the resilience derived from insulating core revenue streams by catering primarily to higher-paying private patients, thus proving the effectiveness of a selective payer mix strategy.



## 2. The Interplay between Efficiency Metrics and Profitability

A pivotal finding of this research is the inverse relationship and critical trade-off between cost efficiency (OER) and asset utilization (ATR) as core drivers of final profitability (NPM/ROA). MIKA's leading NPM is directly attributable to its superior OER control. This indicates rigorous management of administrative and non-clinical overheads and the maintenance of lean administrative processes, which are vital when consciously accepting lower asset utilization (ATR) compared to competitors (Bai et al., 2022). In essence, MIKA demonstrates the capacity to efficiently cover the high fixed costs associated with premium facilities without needing excessive patient throughput.

In sharp contrast, the financial performance of SILO and HEAL illustrates the classic economic principle of DuPont decomposition: lower operating margins are compensated by intensified asset turnover. Their higher ATR and BOR (Table 1) signify highly effective utilization of their sprawling asset base. However, this drive for high volume inevitably increases operational complexity and overhead (higher OER), consequently compressing the NPM. The lower NPM of SILO and HEAL is a direct reflection of the necessity to manage high-volume JKN patients, where the capped tariff structure limits revenue upside, making superior efficiency in resource consumption and patient flow (minimizing LoS) absolutely imperative for generating any minimal profit.

## 3. Theoretical and Managerial Implications

### a. Theoretical Contributions

The findings provide a robust empirical foundation for the theory of strategic segmentation in regulated healthcare settings subject to universal coverage mandates. This study provides statistical evidence that high profitability (MIKA's outcome) and high market penetration/utilization (SILO/HEAL's outcome) are the results of fundamentally divergent and potentially mutually exclusive strategic paths under the JKN framework. This analysis expands upon earlier descriptive studies (Wirawan et al., 2021) by statistically confirming the causal link between operational efficiency metrics and the observed performance divergence.

### b. Practical and Managerial Guidance

The research provides critical guidance for both the investment community and healthcare executives.

- 1) For Investors: MIKA's profile signifies a strategy focused on margin stability and defensive financial performance, suitable for risk-averse portfolios. SILO and HEAL, conversely, represent growth-focused investments whose success is contingent upon aggressive network expansion and sustained operational efficiency gains to mitigate regulatory margin compression.
- 2) For Hospital Management: The study demonstrates that corporations targeting high JKN exposure (like HEAL/SILO) must aggressively adopt operational excellence strategies such as *Lean Hospital principles* and extensive *workflow optimization* to actively reduce their OER and maximize ATR/BOR to levels required for profitability under the JKN system's tight constraints .

## 4. Limitations and Future Research Directions

Despite the application of rigorous panel data techniques, this study is subject to limitations. Firstly, the sample size is restricted to three market-leading, publicly listed corporations, which may not fully reflect the financial dynamics of smaller, non-listed or regional hospitals. Secondly, the reliance on aggregate financial ratios precludes a detailed analysis of granular operational costs, such as nuanced physician compensation schemes or specific supply chain efficiencies, which are known to be crucial OER determinants.

Future research should look to expand the sample size to include a more heterogeneous group of hospitals. Additionally, employing advanced financial decomposition techniques (e.g., extended DuPont analysis) would allow researchers to isolate the specific impact of non-financial metrics such as patient quality



scores, physician engagement levels, or digital technology adoption rates on overall financial efficiency. A complementary qualitative study focusing on management's decision-making processes regarding JKN patient intake, capital expenditure prioritization, and resource allocation would further enrich the interpretation of the observed differences in efficiency and profitability.

## CONCLUSIONS

This study successfully investigated the comparative financial performance and strategic adaptation of Indonesia's leading hospital corporations PT Mitra Keluarga Karyasehat Tbk (MIKA), PT Siloam International Hospitals Tbk (SILO), and PT Medikaloka Hermina Tbk (HEAL) under the structural pressures of the National Health Insurance (JKN) system from 2019 to 2023. The empirical findings align perfectly with the objectives outlined in the Introduction, confirming that the initial expectation regarding divergent strategic responses to the fixed-rate INA-CBG tariff system is valid. The results and discussion sections further substantiate this by demonstrating how measurable differences in efficiency (OER and ATR) directly dictate the profitability (ROA and NPM) of these entities, ensuring a coherent flow of analysis from the conceptual framework to the final empirical evidence.

The prospect of applying these research results is significant for the healthcare industry and policy governance. The demonstrated trade-off between margin quality (the MIKA model) and scale efficiency (the SILO/HEAL model) provides a crucial benchmark for hospital management in Indonesia. Hospitals aiming to increase their JKN exposure must recognize the non-negotiable need for agile operational efficiency to survive low-margin environments, while those targeting the premium segment must maintain uncompromising cost discipline. These findings endorse the strategic implementation of lean management principles as a key instrument for maintaining financial solvency within the JKN ecosystem.

Furthermore, this study opens several prospects for further studies. While the current research identifies the macro-financial impact of the payer mix, future studies should move toward micro-level analysis by leveraging facility-level panel data to investigate regional heterogeneity. There is a clear opportunity to conduct a comprehensive cost-benefit analysis that monetizes administrative labor savings and the impact of digital health integration on the Operating Expense Ratio (OER). Additionally, future research could explore the managerial psychology and decision-making processes of hospital executives regarding JKN acceptance thresholds, providing a more granular understanding of the strategic divergence observed in this study.

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