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Hospital profitability in Indonesia as an emerging market: Internal financial conditions, macroeconomic drivers, and profitability persistence

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Abstract: This study investigates the determinants of hospital profitability in Indonesia as an emerging market by examining internal financial conditions, external macroeconomic and socio-demographic factors, and profitability persistence. Using annual panel data from five publicly listed Indonesian hospitals over 2016–2024, the study applies hospital fixed-effects models and dynamic specifications with lagged return on equity (ROE). Internal financial conditions are represented by composite indices covering liquidity, efficiency, leverage structure, coverage capacity, and profitability margins. The findings show that profitability margins are the strongest and most consistent driver of ROE, while healthier leverage structures also contribute positively to profitability. In contrast, macroeconomic and socio-demographic variables have limited explanatory power once hospital-specific effects are controlled for. Dynamic analysis indicates moderate profitability persistence but does not change the dominant role of internal financial factors. Overall, the study concludes that hospital profitability in emerging markets is shaped mainly by managerial financial decisions rather than external economic conditions, implying that hospital managers should prioritize margin optimization, prudent leverage management, and the use of composite financial indices to monitor financial sustainability.

Keywords: *Emerging markets, Fixed-effects model, Hospital profitability, Internal financial conditions, Return on equity.*

1. Introduction

Corporate profitability remains a central and crucial topic in financial statement analysis (FSA), serving as the ultimate standard for evaluating firm value, assessing financial health, and guiding predictions of future performance [1, 2]. FSA research is fundamentally aimed at improving the forecasting of profitability and generating more accurate estimates of firm value [1]. The residual income model, a dominant valuation method, expresses firm value as a function of return on equity (ROE) and book value, emphasizing the need to focus research on forecasting ROE [1]. FSA extensively investigates the time-series behavior of earnings, confirming the robust phenomenon of persistence and mean reversion in profitability ratios like ROE, Return on Assets (ROA), and Profit Margin (PM) [1].

Profitability indicators are indispensable for evaluating financial risk and detecting fraudulent activities. Ratios assessing a company's profitability, alongside its liquidity and leverage, form the core principles of established corporate earnings manipulation detection models, such as the Beneish M-Score model [3]. Specifically, Return on Equity (ROE) is identified as a key financial indicator for fraud

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detection, reflecting a company's profitability and operational efficiency. Abnormal fluctuations in ROE are strongly correlated with financial fraud [3].

Profitability is widely regarded as the most important and ultimate standard for evaluating business performance, even in environments like Korean National University Hospitals, where achieving profitability is essential for efficient management [2]. Management actions, including the opportunistic manipulation of earnings, are often driven by the desire to avoid reporting losses or to present higher profits to appease stakeholders, confirming that profitability is a key management target [3, 4].

Modern predictive analytics and financial engineering leverage profitability data heavily. Regression models are used to identify patterns and trends in large amounts of financial information, including cash flow and profitability predictions [5]. Machine learning models are specifically employed to process complex financial-statement information efficiently, yielding significantly more accurate forecasts of future profitability compared to traditional linear models [1]. Furthermore, deep-learning architectures are being developed specifically for the long-term forecasting of financial sequences to help investors optimize their strategies and mitigate risks [6].

Despite the growing body of research on firm profitability, empirical evidence focusing on listed hospitals in emerging markets remains limited. Existing studies often rely on single financial ratios or cross-sectional analyses, which may fail to capture the multidimensional nature of internal financial conditions and the dynamic behavior of profitability. Moreover, the interaction between internal financial structures and external macroeconomic factors has received relatively little attention in the healthcare finance literature within a unified panel econometric framework [7, 8].

Indonesia provides a particularly relevant context for addressing this gap. The research by Winoto et al. [9] investigates the drivers of financial and operational success in Indonesian hospitals and, in doing so, highlights several contributing factors to their economic difficulties and competitive vulnerability [9]. As one of the largest emerging economies with a rapidly expanding healthcare sector, Indonesia's hospitals operate under conditions of macroeconomic fluctuation, exchange-rate volatility, and evolving healthcare-financing arrangements. Understanding how internal financial conditions and macroeconomic drivers jointly influence hospital profitability is therefore essential for investors, policymakers, and healthcare managers.

This study contributes to the financial analysis literature by examining the determinants of hospital profitability using panel data from Indonesian listed hospitals over the period 2016–2024. By constructing composite indices of internal financial conditions and incorporating key macroeconomic and socio-demographic variables, the study provides a comprehensive assessment of the drivers of ROE and the persistence of profitability in the healthcare sector of an emerging market.

2. Literature Review

2.1. Firm Profitability and Financial Performance

ROE is widely recognized in financial analysis literature as a crucial measure of performance and explicitly identified as an indicator of a company's profitability, operational efficiency, and debt-paying ability [3]. The residual income model, a dominant valuation method, expresses firm value as a function of return on equity (ROE) and book value, indicating that research should focus on forecasting ROE. This highlights ROE's fundamental role in establishing accurate estimates of firm value as part of fundamental analysis [1].

ROE is one of the five key financial ratios identified by machine learning models as an indicator of financial fraud, confirming its significance as a metric of financial health. Research emphasizes that abnormal fluctuations in ROE are strongly correlated with financial fraud [3]. Managers may be motivated to inflate revenue, conceal expenses, or overstate assets to artificially improve financial performance when ROE falls below expectations.

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2.2. Internal Financial Conditions and Profitability

A substantial body of recent research underscores the role of internal financial management in shaping firm profitability. Liquidity management has been shown to affect operational flexibility and risk exposure, with adequate liquidity generally associated with more stable financial performance [10]. However, excessive liquidity may also signal inefficient resource allocation, suggesting a nuanced relationship with profitability.

Operational efficiency, commonly proxied by asset and working capital turnover ratios, is consistently identified as a key driver of firm performance. Studies demonstrate that firms with higher asset utilization and efficiency tend to generate stronger returns on equity, particularly in capital-intensive industries. In the healthcare sector, inefficient asset deployment can significantly erode profitability due to high fixed costs and substantial capital requirements [1].

Capital structure and leverage remain central themes in profitability research. While leverage can enhance ROE through the leverage effect, recent evidence highlights its asymmetric impact, with excessive leverage increasing financial risk and reducing profitability during adverse economic conditions [1]. For firms with substantial fixed investments, coverage capacity, reflecting the ability to service interest and fixed financial obligations, has emerged as a critical determinant of financial resilience.

Profitability margins, including gross, operating, and net margins, directly capture a firm's ability to convert revenues into earnings. Recent studies show that margin-based measures are among the most robust predictors of ROE across industries, reinforcing their relevance in profitability analysis [1]. Given the strong intercorrelations among financial ratios, several recent studies advocate the use of composite financial indices to summarize internal conditions. Index-based approaches have been shown to reduce multicollinearity, preserve degrees of freedom, and improve interpretability in small-sample panel settings [11, 12].

2.3. Macroeconomic Conditions and Firm Profitability

Macroeconomic environments play a significant role in shaping firm-level profitability. Economic growth generally supports demand expansion and revenue growth, while inflation and interest-rate increases raise operating and financing costs. Recent evidence confirms that these macro-financial channels significantly affect firm profitability, with stronger effects observed in emerging markets [1, 10].

Exchange rate movements represent an additional channel through which macroeconomic conditions influence firm performance. Currency depreciation can increase input and capital costs for firms reliant on imported goods, thereby exerting pressure on profitability. This mechanism is particularly relevant for healthcare providers that depend on imported medical equipment and pharmaceuticals [13].

Socio-demographic factors, such as human development and life expectancy, have also been linked to long-term demand for healthcare services. While these variables are less frequently examined in the corporate finance literature, recent interdisciplinary studies suggest that human development indicators can indirectly influence firm performance by shaping market size, labor productivity, and service demand [14, 15].

2.4. Profitability Persistence and Dynamic Effects

Recent studies highlight that firm profitability often exhibits dynamic persistence, where past performance influences current outcomes due to structural advantages, managerial capabilities, and long-term investment decisions. This persistence has been documented across industries and economic contexts, including emerging markets [13, 14].

Dynamic panel models incorporating lagged profitability measures have become increasingly common in recent empirical work, as they provide insights into the sustainability of firm performance

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and the speed of adjustment toward long-run profitability levels. Ignoring such dynamics may lead to biased estimates and misleading conclusions regarding the determinants of profitability [1, 16].

2.5. Research Gap and Contribution

Despite the expanding literature on firm profitability, empirical evidence focusing on hospitals in emerging markets remains limited, particularly studies that jointly consider internal financial conditions, macroeconomic drivers, and profitability persistence within a unified panel econometric framework. Existing healthcare finance studies often rely on single financial ratios or cross-sectional designs, which may overlook the multidimensional nature of financial performance and dynamic adjustment processes.

This study contributes to the literature by integrating composite internal financial indices, macroeconomic and socio-demographic factors, and dynamic persistence to analyze hospital profitability in Indonesia. By focusing on listed hospitals in an emerging-market context, the study extends recent profitability research into a sector and region that remain underexplored in the financial analysis literature.

3. Hypothesis Development

Prior research in financial statement analysis emphasizes that firm profitability is primarily shaped by internal financial decisions rather than by external conditions alone, particularly in capital-intensive and regulated industries. Hospitals represent a distinctive organizational setting in which operating margins, capital structure, and financial discipline are expected to play a central role in determining return on equity (ROE).

3.1. Internal Financial Conditions and Profitability

Profitability margins capture a firm's ability to convert revenues into earnings after accounting for operating and financial costs. The literature consistently identifies margins as a core driver of ROE, reflecting pricing power, cost efficiency, and managerial effectiveness [1, 2]. In the healthcare sector, where demand is relatively inelastic and pricing is often regulated, variations in margins are largely attributable to internal operational and financial management rather than to market-wide conditions. Accordingly, hospitals with stronger profitability margins are expected to exhibit higher ROE.

H_1: Profitability margins are positively associated with hospital ROE.

Capital structure theory further suggests that leverage affects profitability through both risk amplification and tax-shield mechanisms. While excessive leverage may undermine financial stability, a healthy and well-managed leverage structure can enhance ROE by optimizing the use of debt financing in capital-intensive organizations such as hospitals. Empirical evidence indicates that leverage effects are particularly relevant in healthcare, where long-term assets and stable cash flows allow for sustainable debt usage [2, 15].

H_2: A healthier leverage structure is positively associated with hospital ROE.

Liquidity and operational efficiency are traditionally viewed as supporting conditions for firm performance. Adequate liquidity ensures short-term solvency and operational flexibility, while efficiency reflects effective asset utilization. However, prior studies suggest that these factors tend to play a secondary role once profitability margins and capital structure are accounted for, especially in mature service industries [1]. Therefore, their impact on ROE is expected to be positive but relatively weaker.

H_3: Liquidity and efficiency exhibit a positive but weaker association with hospital ROE compared to profitability margins and leverage structure.

3.2. External Conditions and Profitability

Macroeconomic variables such as economic growth, inflation, interest rates, and exchange rate movements influence firms through demand conditions and financing costs. Nevertheless, hospitals operate under relatively regulated pricing regimes and provide essential services, which may insulate

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profitability from short-term macroeconomic fluctuations. Prior evidence suggests that once firm-specific financial conditions are controlled for, the direct impact of macroeconomic variables on profitability is limited [1].

H_4: Macroeconomic conditions do not have a strong direct effect on hospital ROE once hospital-specific financial conditions are controlled for.

Similarly, social-demographic indicators such as human development and life expectancy reflect long-term structural characteristics of the healthcare environment. While these factors shape demand and public health outcomes over extended horizons, their short-term influence on hospital profitability is expected to be indirect and muted. Consequently, their contemporaneous association with ROE is anticipated to be weak.

H_5: Social-demographic conditions do not have a significant direct association with hospital ROE in the short run.

3.3. Profitability Persistence

The profitability literature documents that firm performance often exhibits persistence due to structural advantages, managerial capabilities, and adjustment costs. However, persistence is rarely complete, as competitive pressures and regulatory constraints induce gradual mean reversion. In the hospital context, moderate persistence is expected, reflecting operational inertia without implying permanent profitability advantages.

H_6: Hospital ROE exhibits moderate persistence over time.

Taken together, these hypotheses reflect a conceptual framework in which internal financial conditions constitute the primary determinants of hospital profitability, while external macroeconomic and sociodemographic factors play a limited role, and profitability persistence is present but not dominant. This framework directly motivates the use of static and dynamic hospital fixed-effects models employed in the empirical analysis.

4. Method

4.1. Research design

This study employs a quantitative panel econometric approach to investigate the determinants of hospital financial performance in Indonesia. The analysis focuses on Return on Equity (ROE) as a key indicator of profitability and capital efficiency. A panel framework is adopted to account for cross-sectional heterogeneity across hospitals and time-varying macroeconomic conditions, which are commonly emphasized in studies of firm performance and healthcare finance [17, 18]. Given the limited number of cross-sectional units and the relatively short time dimension, the empirical strategy prioritizes model parsimony and robustness, consistent with best practices in small-sample panel studies [19].

4.2. Data and Sample

The sample consists of annual panel data from five publicly listed hospitals in Indonesia, HEAL, MIKA, SAME, SILO, and SRAJ, covering the period 2016–2024. This yields a balanced panel with a maximum of 45 observations. Hospital-level financial data are obtained from audited financial statements, while macroeconomic and socio-demographic variables are collected from official national statistical sources. Before estimation, all variables are screened for missing values and extreme outliers to ensure data consistency and reliability, as recommended in empirical corporate finance research [20].

4.3. Variables

4.3.1. Dependent Variable

The dependent variable is Return on Equity (ROE), measured in decimal form as net income divided by total equity. ROE is widely used in the finance and healthcare management literature as a

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comprehensive indicator of profitability and shareholder value, particularly in capital-intensive industries [21, 22].

Independent variable: External variables

To control for exogenous conditions that may influence hospital performance, the following time-varying external variables are included: economic growth (ECG), change in exchange rate (CEG), inflation rate (INF), policy interest rate (BIR), Human Development Index (IPM), and life expectancy (UHH).

These variables capture macroeconomic activity, monetary conditions, and sociodemographic factors that affect healthcare demand, cost structures, and financing conditions [23, 24].

Independent variable: Internal financial indices

The study considers a broad set of internal financial ratios related to liquidity, efficiency, leverage, coverage, and profitability margins. To avoid multicollinearity and loss of degrees of freedom, common concerns in small-panel settings, these ratios are summarized into composite financial indices following an index-based approach [25, 26].

All financial ratios are first standardized using z-scores. Five indices are then constructed:

1. Liquidity Index (LIQ), capturing short-term solvency
2. Efficiency Index (EFF), reflecting asset and working capital utilization
3. Leverage Index (LEV*), defined such that higher values indicate lower leverage risk
4. Coverage Index (COV), measuring the ability to service fixed financial obligations
5. Margin Index (MAR), representing operating and net profitability

Higher index values indicate stronger internal financial conditions.

4.4. Econometric Specification

4.4.1. Baseline Fixed Effects Model

To control for unobserved, time-invariant heterogeneity across hospitals, such as ownership structure, management quality, and service specialization, the baseline specification adopts a hospital fixed effects model:

$$ROE_{it} = \alpha_i + \delta' X_t + \theta' Z_{it} + \varepsilon_{it} \quad (1)$$

Where α_i denotes hospital-specific fixed effects. X_t is the vector of external variables, and Z_{it} represents the internal financial indices. Fixed-effects estimation is appropriate when unobserved heterogeneity is correlated with the regressors, a common feature in firm-level panel data [27].

Year fixed effects are not included, as the external variables are common across hospitals within each year and would otherwise be absorbed by time dummies.

4.4.2. Dynamic Specification

To examine the persistence of profitability, a dynamic specification is estimated by including a lagged dependent variable:

$$ROE_{it} = \alpha_i + \rho ROE_{i,t-1} + \delta' X_t + \theta' Z_{it} + u_{it} \quad (2)$$

This formulation captures inertia in hospital financial performance, which has been documented in studies of firm profitability and capital structure [16, 28].

4.4.3. Estimation Strategy and Robustness

Model selection between fixed and random effects is guided by the Hausman test. To ensure valid statistical inference, heteroskedasticity-robust standard errors are employed. Robustness checks are conducted using alternative model specifications that separately include monetary variables (ECG, CEG, INF, BIR) and socio-demographic variables (IPM, UHH) to mitigate potential multicollinearity among external factors.

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Overall, the adopted methodology provides a parsimonious and interpretable econometric framework for assessing how internal financial conditions and external macroeconomic factors influence hospital profitability. By combining composite financial indices with fixed effects and dynamic specifications, the study establishes a robust baseline suitable for further methodological extensions.

5. Results

This section presents the empirical findings from the panel fixed-effects estimations. The analysis proceeds in three stages. First, static fixed-effects models are estimated using separate blocks of external variables (macroeconomic and sociodemographic). Second, dynamic fixed-effects specifications including lagged ROE are estimated as robustness checks to account for profitability persistence. Throughout all specifications, hospital fixed effects are included to control for time-invariant heterogeneity across hospitals.

5.1. Static Fixed-Effects Models

Model 1: Macroeconomic Conditions

Table 1 reports the results of the static fixed-effects model incorporating macroeconomic variables (economic growth, exchange-rate changes, inflation, and policy interest rates) alongside internal financial indices.

Table 1.
Static Fixed-Effects Model: Macroeconomic Specification.

Variable	Coefficient	Std. Error	t-Statistic	p-value
ECG	0.130	0.162	0.81	0.444
CEG	0.100	0.118	0.85	0.421
INF	−0.349	0.856	−0.41	0.694
BIR	0.046	1.114	0.04	0.968
LIQ	2.323	4.208	0.55	0.596
EFF	2.888	2.539	1.14	0.288
LEVS	4.615	2.081	2.22	0.057
COV	0.085	1.122	0.08	0.942
MAR	15.080	3.068	4.92	0.001

Note: The model is estimated using a static panel fixed-effects specification with hospital-specific effects. Year fixed effects are not included. Heteroskedasticity-robust standard errors clustered by period are employed. The model exhibits a high explanatory power, with an R^2 / Adj. R^2 of 0.919/0.885, indicating that the included variables explain a substantial proportion of the variation in hospital ROE.

The results indicate that macroeconomic variables do not exert a statistically significant effect on hospital ROE once hospital fixed effects are controlled for. In contrast, internal financial conditions play a dominant role. In particular, the margin index (MAR) exhibits a strong and highly significant positive association with ROE, while the leverage-structure index (LEVS) shows a positive and marginally significant effect.

Model 2: Social-Demographic Conditions

Table 2 presents the static fixed-effects model using sociodemographic variables (human development and life expectancy).

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Table 2.
Static Fixed-Effects Model: Social-Demographic Specification.

Variable	Coefficient	Std. Error	t-Statistic	p-value
IPM	0.493	0.865	0.57	0.585
UHH	0.106	0.634	0.17	0.872
LIQ	4.062	3.789	1.07	0.315
EFF	2.619	2.137	1.23	0.255
LEVS	4.640	1.886	2.46	0.039
COV	0.434	1.174	0.37	0.721
MAR	15.325	2.564	5.98	0.000

Note: The model is estimated using a static panel fixed-effects specification with hospital-specific effects. Year fixed effects are not included. Heteroskedasticity-robust standard errors clustered by period are applied. The model demonstrates strong explanatory power, with an R^2/Adj. R^2 of 0.919/0.892, indicating that the selected social-demographic and internal financial variables account for a large share of the variation in hospital ROE.

Consistent with Model 1, sociodemographic variables do not display a direct effect on hospital profitability. Internal financial indices remain the primary determinants of ROE, with profitability margins and leverage structure showing robust and economically meaningful effects. Notably, the results are more stable and freer from numerical warnings compared to the macroeconomic specification.

5.2. Dynamic Fixed-Effects Models

To examine profitability persistence, lagged ROE is introduced into the fixed-effects framework. Given the short time dimension, these models are interpreted as robustness checks rather than primary identification strategies.

Dynamic Model: Macroeconomic Specification

Table 3.
Dynamic Fixed-Effects Model: Macroeconomic Specification.

Variable	Coefficient	Std. Error	t-Statistic	p-value
ROE(t−1)	0.116	0.045	2.57	0.037
ECG	0.157	0.142	1.10	0.307
CEG	0.204	0.122	1.67	0.138
INF	−0.343	0.711	−0.48	0.644
BIR	−0.398	0.908	−0.44	0.674
LEVS	5.385	2.132	2.53	0.040
MAR	15.812	3.259	4.85	0.002

Note: The model is estimated using a dynamic panel fixed-effects specification with hospital-specific effects, including lagged ROE to capture profitability persistence. Year fixed effects are not included. Heteroskedasticity-robust standard errors clustered by period are employed. The model exhibits very high explanatory power, with an R^2/Adj. R^2 of 0.939/0.905, indicating a strong fit after accounting for dynamic effects.

The positive and significant coefficient on lagged ROE indicates moderate profitability persistence. Importantly, the key internal financial indices, particularly margins and leverage, remain significant, confirming the robustness of the main findings.

Dynamic Model: Social-Demographic Specification

Table 4.
Dynamic Fixed-Effects Model: Social-Demographic Specification.

Variable	Coefficient	Std. Error	t-Statistic	p-value
ROE(t−1)	0.072	0.044	1.63	0.147
IPM	0.325	1.257	0.26	0.803
UHH	0.008	0.950	0.01	0.994
LEVS	5.045	1.815	2.78	0.027
MAR	16.275	3.063	5.31	0.001

Note: The model is estimated using a static panel fixed-effects specification with hospital-specific effects. Year fixed effects are not included. Heteroskedasticity-robust standard errors clustered by period are employed. The model exhibits a high explanatory power, with an R^2/Adj. R^2 of 0.919/0.900, indicating that the included variables explain a substantial proportion of the variation in hospital ROE.

In this specification, lagged ROE is not statistically significant, suggesting limited persistence once sociodemographic conditions are considered. Nevertheless, the effects of margins and leverage structure remain strong and highly significant.

6. Discussion

This study set out to examine hospital profitability in an emerging market by testing six hypotheses related to internal financial conditions, external factors, and profitability persistence. The empirical results provide strong and consistent support for hypotheses emphasizing internal financial determinants, while offering limited support for hypotheses concerning external conditions.

Consistent with H1, the results show that profitability margins (MAR) are positively and strongly associated with ROE across all static and dynamic specifications. This finding confirms that margins represent the most direct channel through which hospitals translate revenues into shareholder returns. In regulated healthcare environments, margin variation largely reflects managerial effectiveness in cost control and operational efficiency rather than demand expansion, reinforcing the theoretical expectation that margins play a central role in profitability determination.

The evidence also supports H2, which predicts a positive association between a healthy leverage structure and ROE. The leverage structure index (LEVS) remains statistically significant in both static and dynamic models, indicating that prudent use of debt enhances profitability in capital-intensive hospital operations. This result aligns with capital structure theory in regulated industries, where stable cash flows allow hospitals to benefit from financial leverage without incurring excessive distress risk.

Regarding H3, liquidity and efficiency indices exhibit positive but comparatively weaker associations with ROE and are generally not statistically significant once margins and leverage are included. This suggests that liquidity and efficiency function as supporting financial conditions, facilitating operations rather than directly driving profitability. Their reduced explanatory power relative to margins and leverage is consistent with prior financial-statement analysis literature.

In contrast, the findings provide support for H4 and H5, which posit that external macroeconomic and socio-demographic factors do not exert a strong direct influence on hospital profitability in the short run. Neither macroeconomic indicators (economic growth, inflation, interest rates, exchange rates) nor sociodemographic variables (human development and life expectancy) show consistent significance once hospital fixed effects are controlled for. This indicates that hospitals are relatively insulated from short-term external fluctuations, likely due to regulated pricing mechanisms and the essential nature of healthcare services.

Finally, the dynamic analysis offers partial support for H6. Lagged ROE is positive and significant in the macroeconomic specification, indicating moderate profitability persistence, but becomes insignificant in the social-demographic specification. This pattern suggests that profitability persistence exists but is not dominant and does not override the influence of internal financial management. Importantly, the inclusion of lagged ROE does not diminish the significance of margins and leverage, confirming that the main results are not driven by performance inertia alone.

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7. Conclusions

This study examines hospital profitability in an emerging market by empirically testing hypotheses related to internal financial conditions, external influences, and profitability persistence. Using static and dynamic hospital fixed-effects models, the analysis yields several clear conclusions.

First, hypotheses H1 and H2 are strongly supported: hospital profitability is primarily driven by profitability margins and leverage structure. Second, H3 is partially supported, as liquidity and efficiency exhibit weaker and less consistent effects on ROE. Third, hypotheses H4 and H5 are supported, indicating that macroeconomic and social-demographic conditions have limited direct explanatory power for hospital profitability in the short run. Finally, H6 receives partial support, with evidence of moderate profitability persistence that does not dominate internal financial effects.

Taken together, these findings indicate that hospital profitability in emerging markets is shaped predominantly by internal financial management rather than external conditions, with persistence playing a secondary role.

8. Implications

8.1. Managerial Implications

The confirmation of hypotheses H1–H3 highlights the importance of internal financial decision-making. Hospital managers should prioritize margin optimization through cost control, pricing discipline, and operational efficiency, while maintaining a sustainable leverage structure. Improvements in liquidity and efficiency should be viewed as enabling conditions rather than primary profitability drivers.

8.2. Investor Implications

For investors, the support for H1, H2, and H6 suggests that evaluating hospital performance should focus on internal financial fundamentals and profitability persistence, rather than on macroeconomic indicators. Composite financial indices provide a practical and interpretable framework for hospital valuation and performance monitoring.

8.3. Policy Implications

The validation of H4 and H5 implies that policy frameworks and reimbursement systems play a stabilizing role in shielding hospitals from short-term economic volatility. Policymakers may, therefore, focus on enhancing transparency, financial reporting quality, and capital-management standards to support hospital financial sustainability.

9. Limitations and Future Research

Several limitations should be noted when interpreting the hypothesis-based findings. First, the small sample size limits the generalizability of the results beyond the listed hospitals. Second, the short time dimension restricts the use of more advanced dynamic estimators, suggesting caution in interpreting profitability persistence (H6). Third, external variables may exert long-term or indirect effects not captured in annual profitability models, which may partially explain the limited support for H4 and H5.

Future research may extend this hypothesis framework by examining longer time horizons, incorporating quality-of-care or patient outcome measures, and exploring cross-country hospital samples to assess institutional heterogeneity in profitability drivers.

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Transparency:

The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

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