

From Balance Sheets to Market Performance: How Internal Efficiency and Economic Conditions Shape Shareholder Value in Indonesian Major Banks

Arya Pradipta, Jagat Prirayani

Institut Teknologi Bandung, Indonesia

Email: 29124132@mahasiswa.itb.ac.id, jagat.prirayani@itb.ac.id

ABSTRACT

This study investigates how internal efficiency and external macroeconomic conditions jointly shape the profitability and shareholder value of Indonesia's major banks under the KBMI 3 and KBMI 4 classifications during the post-COVID-19 period (2020–2024). Using a quantitative-causal explanatory design and panel data regression, the research analyzes quarterly financial and macroeconomic data from 15 publicly listed banks. Internal determinants are measured through bank size (KBMI), seasonal periods (Q1–Q4), and the CAMEL framework—Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Good Corporate Governance (GCG), Operational Efficiency (BOPO), and Loan-to-Deposit Ratio (LDR)—while external determinants include GDP growth, inflation, unemployment rate, consumer and business confidence indices, Bank Indonesia rate, exchange rate, and COVID-19 period. The results indicate that credit quality (NPL), intermediation efficiency (LDR), seasonal periods, and bank scale (KBMI) significantly affect profitability (ROA) and quarterly earnings per share (QEPS). Externally, consumer confidence, business optimism, and employment conditions play a supporting but secondary role. Overall, the findings highlight that sustainable profitability in Indonesia's major banks is driven primarily by internal management efficiency, prudent risk governance, bank scale, and adaptive response to macroeconomic fluctuations, providing valuable insights for regulators, investors, and policymakers in maintaining financial stability and shareholder value.

KEYWORDS

Bank Profitability; Shareholder Value; CAMEL Framework; Macroeconomic Determinants;



This work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International

INTRODUCTION

The banking sector plays a vital role in maintaining the stability and growth of the national economy. As financial intermediaries, banks help mobilize funds, provide loans, and facilitate secure transactions (Chibueze, 2025; Okaro, 2025). All these activities keep liquidity and capital flowing smoothly among the economic parties involved (Challoumis, 2024; Dashkevich et al., 2024). Over the last decade, the global banking industry has undergone several major changes—stricter regulations under the Basel III framework, rapid advances in digital technology, increasing competition from both traditional banks and new fintech companies, as well as global challenges like the COVID-19 pandemic and geopolitical tensions—that have reshaped how the banking sector operates. In the dynamic global financial sector, consistently delivering value to stakeholders has become more essential than ever.

The rapid changes in the global financial landscape have also transformed the way banks operate in emerging countries such as Indonesia (Anestiawati et al., 2025; Jameaba, 2024). Because the banking sector is crucial for maintaining monetary stability and promoting economic growth, the ability of Indonesian banks to provide sustainable returns for their shareholders is likely influenced by a set of internal bank-specific factors and external macroeconomic conditions. This demanding role becomes even more complex for large financial institutions in terms of asset size and market share. As they are the largest, most influential, and capable of exerting systemic impact on financial pillars in the market, ensuring

consistent shareholder returns is quite challenging since their profitability determinants might be affected by more than a single parameter (Ermawati, 2024; Rosenzweig & Julia, 2025).

In Indonesia, according to *Otoritas Jasa Keuangan* (POJK No 12/03-2021, n.d.), banks are classified into *Kelompok Bank berdasarkan Modal Inti* (KBMI) framework. This framework is based on banks' Tier-1 core capital—KBMI 1, KBMI 2, KBMI 3, and KBMI 4. The *Otoritas Jasa Keuangan* (OJK) requires a minimum core capital of at least Rp 14 trillion for KBMI 3 banks and Rp 70 trillion for KBMI 4 banks. According to this structure, KBMI 3 and KBMI 4 banks represent the largest institutions in terms of size, market influence, and systemic importance. As of December 2024, these banks accounted for around 78% of total lending activity in Indonesia and held nearly 75% of all banking assets in the country (Statistik Perbankan Indonesia - Desember 2024, n.d.). Because of their scale and influence, the performance of these banks may be affected by several internal bank-performance factors as well as external macroeconomic indicators.

The emergence of the COVID-19 pandemic, which began in early 2020, brought not only serious challenges but also new opportunities for transformation in the banking industry (Gaviyau & Godi, 2025; Semanne, 2025). The crisis reshaped how banks operated to adapt to changing economic conditions and customer needs. In Indonesia, the banking sector faced a period of loan restructuring, higher credit risks, unstable interest rates, and reduced consumer demand. At the same time, the pandemic pushed banks to accelerate the use of digital banking services as customers shifted toward online transactions (Kandpal et al., 2025).

To respond to these challenges, the Indonesian government and financial regulators—Bank Indonesia (BI) and the Financial Services Authority (OJK)—introduced a series of stimulus regulations and loan restructuring programs to assist in stabilizing Indonesia's financial system. For example, the OJK simplified credit quality analysis for loans under Rp 10 billion and implemented loan restructuring programs with Regulations No. 11/POJK.03/2020, No. 48/POJK.03/2020, and No. 17/POJK.03/2021. On the BI side, the 7-Day Reverse Repo Rate was reduced to 3.5%, marking the lowest policy rate since the 1998 financial crisis. These combined efforts were designed to keep the banking sector liquid, support real sectors, and enable the Indonesian economy to recover in the aftermath of the pandemic.

The global shocks following the COVID-19 outbreak lasted longer than expected. After the crisis and subsequent recovery period, the world economy continued to experience new waves of turbulence, such as commodity price fluctuations, foreign exchange volatility, and cross-border geopolitical tensions. These sequential disruptions have placed further pressure on managing bank profitability and market performance. In this context, understanding how banks—particularly Indonesian banks—navigate operational challenges and external shocks to provide consistent shareholder returns becomes crucial in determining bank attractiveness in the financial market (Wang, 2025; Xu et al., 2024).

Assessing banks' attractiveness from the perspective of shareholders may be subjective, yet this paper argues it should reflect business profitability and sustainability as well as provide market-based benefits. From that standpoint, Return on Assets (ROA) and Quarterly Earnings Per Share (QEPS) are two of the most prominent indicators reflecting banks' profitability and attractiveness to investors. ROA reflects internal efficiency in utilizing assets to generate income, while QEPS directly measures the value generated for shareholders. Both ratios thus serve as financial and market-based performance indicators. Fluctuations in ROA and QEPS may be influenced by a combination of internal determinants—such as capital adequacy, asset quality, management efficiency, liquidity, bank size, and seasonal effects—and external determinants, such as GDP growth, inflation, business sentiment, unemployment rate, and exchange rate movements (Strekalina et al., 2023).

Internally, the CAMEL framework (Capital Adequacy, Asset Quality, Management, Earnings, and Liquidity) is a well-established method for assessing bank soundness. Ratios such as Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Good Corporate Governance (GCG), Operating Expense to Operating Income (BOPO), and Loan to Deposit Ratio (LDR) provide insights into the internal efficiency and financial health of banks. Additionally, from the internal perspective, this paper also examines bank size, represented by KBMI, and seasonal periods, represented by Quarters 1–4, to test the impact of bank size and any quarterly routine effects on overall bank performance. Externally, macroeconomic indicators such as GDP growth, inflation rate, Consumer Confidence Index (CCI), Business Confidence Index (BCI), unemployment rate, Bank Indonesia (BI) rate, the USD/IDR exchange rate, and the COVID-19 pandemic period covering Q1 2020 to Q2 2022 represent broader economic conditions that influence investor behavior and banking profitability.

This paper focuses on the Indonesian banking industry, particularly under KBMI 3 and KBMI 4 banks, for two main reasons. First, commercial banks within these categories account for the majority of total lending in Indonesia. Second, achieving sustainable profitability among KBMI 3 and KBMI 4 banks cannot be explained by a single factor. Their classification reflects their size, systemic importance, and capacity to influence financial stability. To capture the post-pandemic financial dynamics of KBMI 3 and 4 banks, this study examines the 2020–2024 period, representing the most recent phase of recovery and restructuring after the COVID-19 outbreak. Given the dynamic post-pandemic environment and the quarterly nature of financial reporting, this study focuses on Return on Assets (ROA) and Quarterly Earnings Per Share (QEPS) to capture both short-term and structural changes in bank performance. By integrating internal and external determinants, this research aims to provide a holistic understanding of what drives financial performance and investor-oriented profitability among Indonesia's major banks.

Studies exploring the determinants of banking profitability have been conducted by many scholars. For example, previous studies showed that evaluating both accounting-based (ROA) and market-based (EPS) indicators provides a more holistic understanding of banking performance (Endri et al., 2020; Le, 2020; Yuan et al., 2022). Furthermore, Endri et al. (2020) demonstrated how both bank-specific ratios, such as CAR, BOPO, LDR, and NPL, as well as macroeconomic indicators, such as inflation, exchange rate, and BI rate, determine profitability in Indonesian commercial banks. A similar conclusion came from Horobet et al. (2021) who confirmed the dual role of internal (represented by CAMELS ratios) and macroeconomic determinants in shaping banking profitability. A thesis from Saif-Alyousfi (2020) provided cross-country evidence from 47 Asian countries, showing that determinants are not only internal but also depend on country-level economics and industry structure. On a broader perspective, Pennacchi & Santos (2021) observed that although banks often target ROE, QEPS remains a direct indicator of value delivered to shareholders, reinforcing the relevance of including it alongside ROA in performance analysis.

This study makes several important contributions. First, from an intellectual perspective, understanding internal and external determinants that influence banking profitability provides deeper insights into the interconnected nature of financial performance. Second, from a contextual perspective, understanding factors affecting banking profitability, particularly during financial distress like the COVID-19 outbreak, can offer valuable lessons for policymakers to mitigate similar issues in the future. Third, from a managerial perspective, these findings can help bank executives align internal efficiency with external dynamics to sustain profitability and shareholder value in turbulent environments. Lastly, for all stakeholders—including investors, employees, customers, and regulators—this research offers valuable insights into how Indonesia's significant banks maintain consistent performance and stability and translate them into diverse perspectives. For banks, the findings can inform

strategies to sustain profitability; for investors, they provide guidance in making sound investment decisions. For employees, customers, and borrowers, the results help build confidence in the consistency and reliability of bank operations. Finally, for policymakers and regulators, the research offers evidence on whether current financial policies have effectively supported stability or if further adjustments are needed to enhance resilience in the banking system.

This study stands out from similar literature in several important ways. First, rather than solely analyzing banking profitability determinants from an internal perspective, it also investigates external determinants from a macroeconomic perspective, which is rarely addressed in past studies. Second, the research focuses on KBMI 3 and KBMI 4 publicly-listed banks, which represent the majority of total bank assets and lending in Indonesia, thus reflecting the overall health and stability of the country's financial system. Third, the methodology centers on the post-COVID-19 period—a time when banks and regulators reshaped policies to strengthen resilience against future uncertainties. Fourth, methodologically, the research employs two performance indicators: Return on Assets (ROA) as an accounting-based measure of operational efficiency, and Quarterly Earnings per Share (QEPS) as a market-based measure of shareholder value. By bridging profitability and shareholder-value perspectives, it not only extends the applicability of the CAMELS model but also enhances understanding of how macroeconomic dynamics shape investor confidence in Indonesia's major banks.

At the heart of stakeholder concerns lies the issue of financial performance inconsistency among Indonesia's major banks. Such volatility reflects potential weaknesses in how banks manage complex internal and external challenges—ranging from operational inefficiency and governance gaps to macroeconomic shocks and policy uncertainty. If left unaddressed, this inconsistency threatens not only profitability but also institutional credibility, market confidence, and systemic stability. Given these conditions, it is crucial to identify which internal determinants (such as capital adequacy, asset quality, governance, efficiency, and liquidity) and external determinants (including GDP growth, inflation, consumer and business confidence, BI rate, and exchange rate fluctuations) have the most significant impact on bank profitability and shareholder value. Therefore, this study aims to analyze how internal and macroeconomic factors jointly influence the profitability (ROA) and shareholder value (QEPS) of Indonesia's KBMI 3 and 4 banks during the 2020–2024 post-COVID-19 period, providing actionable insights for both managerial decision-making and regulatory strategy. The findings are expected to contribute significantly to both theoretical understanding and practical application.

RESEARCH METHOD

This study employed a quantitative–causal explanatory design to analyze how internal and external factors influenced the profitability and shareholder value of major Indonesian banks. The research focused on KBMI 3 and KBMI 4 commercial banks listed on the Indonesia Stock Exchange (IDX) during the post-COVID-19 period from the first quarter of 2020 to the fourth quarter of 2024. A panel data regression approach was applied to capture both cross-sectional variations among banks and time-series changes across quarters, with analysis conducted using Stata 17 under pooled OLS, fixed effects, and random effects frameworks.

The sample was selected via purposive sampling from all OJK-supervised commercial banks, specifically including publicly-listed KBMI 3 and KBMI 4 banks that published consistent quarterly financial data from 2020 to 2024. This resulted in a final sample of 15 banks, comprising 4 KBMI 4 and 11 KBMI 3 institutions, which collectively represented over 75% of Indonesia's banking assets. The study utilized secondary quantitative data sourced from

quarterly financial statements from the IDX and OJK, macroeconomic indicators from Bank Indonesia and the Central Statistics Agency (BPS), and market data from financial aggregators.

RESULTS AND DISCUSSION

Descriptive Statistics

1. Profitability Indicators
 - a. The average ROA is 2,08% with a minimum of -0,6% and a maximum of 4,86%. This shows that most large Indonesian banks maintained stable profitability during 2020 – 2024, despite pandemic effects.
 - b. The mean QEPS is approximately Rp 69,45, but with a large standard deviation which is Rp 71,43, implying high variability in market-based returns among banks – possibly driven by stock performance, dividend policy, number of shares outstanding, and investor sentiment differences.
2. Internal (CAMELS) Determinants
 - a. CAR averages 23,76%, comfortably above regulatory minimums, indicating strong capitalization.
 - b. Net NPL remains low, which is 0,89%, suggesting prudent credit risk management.
 - c. BOPO averages 74,79%, meaning operating costs consume nearly three-quarters of income – efficiency remains a challenge.
 - d. LDR stands at 87,86%, showing healthy but slightly tight liquidity management
 - e. GCG averages 1,84 out of 5, implying generally good governance scores.
3. External Determinants (Macroeconomic Variables)
 - a. Gross Domestic Product (GDP) Growth averages 3,4%, consistent with Indonesia's gradual recovery after the Covid-19 downturn.
 - b. Inflation Rate (INF) averages 2,75%, remained within Bank Indonesia's target range.
 - c. Consumer Confidence Index (CCI) with a mean of 113,13 reflects strong consumer sentiment and improved spending expectations.
 - d. Business Confidence Index (BCI) averages 7,45 denotes a moderately optimistic business climate.
 - e. Unemployment Rate (UMP) with the mean of 0,43% (ranging 0,05-7,07%) captures fluctuations in labor market recovery during and after the pandemic.
 - f. BI Rate averages 4,8%, reflects a balanced monetary stance – supporting growth while containing inflation.
 - g. Exchange Rate (USD/IDR JISDOR) averaged Rp 15.097/USD, signaling relative stability.

Overall, the descriptive statistics indicate that Indonesia's KBMI 3 and 4 banks maintained strong capitalization, low credit risk, and moderate profitability throughout the 2020 – 2024 period. The dispersion in ROA and especially QEPS highlights variations in operational efficiency and investor perception among banks. Externally, Indonesia's stable inflation, steady GDP growth, and positive confidence indices reflect a resilient post-pandemic economy, while moderate shifts in unemployment, policy rates, and exchange rates capture the macroeconomic adjustments shaping bank performance.

Diagnostic Tests

Before proceeding to the regression analysis, several diagnostic tests were performed to examine data distribution, group differences, and the strength of relationships between variables. These tests include normality testing, mean-difference testing, and correlation analysis.

1. Normality Test

The Skewness-Kurtosis test (sktest) was conducted to assess whether the variables were normally distributed.

The results show that most variables violate the assumption of normality at the 5% significance level ($\text{Prob} > \chi^2 < 0.05$). This non-normality is common in panel data involving financial ratios, as banks' performance indicators tend to exhibit asymmetry and outliers (Endri et al., 2020; Yuan et al., 2022). Given the large sample size ($N = 300$), the Central Limit Theorem ensures that the regression estimations remain valid, especially when robust standard errors are applied to correct for heteroskedasticity and serial correlation.

2. Mean-Difference Test (KBMI 3 vs KBMI 4)

To examine potential performance differences between KBMI 3 and KBMI 4 banks, a two-sample t-test was conducted for both profitability indicators (ROA and QEPS).

Table 1. Mean-Difference Test Results Between KBMI 3 and KBMI 4 Banks

Variable	KBMI 3 Mean	KBMI 4 Mean	Mean Difference	t- statistic	p- value	Interpretation
ROA	0.0172	0.0307	-0.0135	-13.06	0.000	Significant
QEPS	44.79	137.28	-92.49	-12.09	0.000	Significant

3. Correlation Analysis

A pairwise correlation matrix (pworth) was used to assess the relationships among the independent and dependent variables.

The analysis reveals several key relationships:

- ROA is positively correlated with QEPS ($r = 0.53$, $p < 0.01$), indicating that accounting-based profitability aligns with market-based performance.
- Among internal variables, BOPO shows a strong negative correlation with ROA ($r = -0.77$) and QEPS ($r = -0.46$), confirming that higher operational costs reduce profitability.
- NPL is also negatively correlated with both profitability indicators (ROA: -0.35 ; QEPS: -0.31), reflecting the adverse impact of credit risk.
- CAR and GDP growth show weak but positive associations with profitability, implying that capital strength and economic growth enhance bank performance.
- Moderate correlations among macroeconomic indicators such as GDP, INF, CCI, and BCI ($r > 0.7$) are expected, given their interconnected nature in reflecting macroeconomic cycles.

Since no pair of independent variables exceeds the critical multicollinearity threshold ($r > 0.80$), all variables were retained for regression analysis.

Panel-Regression Analysis

1. ROA – Banking Model

a. Overview

This section investigates the effect of internal banking determinants—namely Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Good Corporate Governance (GCG), Operational Efficiency (BOPO), and Loan-to-Deposit Ratio (LDR)—on Return on Assets (ROA) for KBMI 3 and KBMI 4 banks during 2020–2024. Additional control variables include COVID-19 dummy, KBMI category, and quarterly dummies (Q2–Q4) to account for pandemic influence, bank group classification, and seasonal effects.

The regression was estimated under three panel data specifications: Pooled OLS, Fixed Effects (FE), and Random Effects (RE).

Model selection was determined using the Hausman specification test, followed by robust estimation to correct for potential heteroskedasticity and serial correlation.

b. Model Selection : Hausman Test

The Hausman test compares the FE and RE estimators to determine whether bank-specific effects are correlated with the independent variables.

Table 2. Hausman Test Results for ROA – Banking Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	9.60	9	0.3837	Fail to reject H_0

Since Prob > χ^2 (0.3837) > 0.05, the null hypothesis cannot be rejected, indicating that the Random Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the RE model with robust standard errors.

c. Random Effects Model Results (Robust)

The Random Effects model with robust standard errors clustered by bank was employed to ensure reliability against heteroskedasticity and serial correlation. The model's Wald $\chi^2 = 295.17$ ($p < 0.001$) confirms that all predictors are jointly significant, while the overall $R^2 = 0.6029$ suggests that approximately 60% of ROA variation is explained by the independent variables.

Based on 5% significant level, the results show that profitability is influenced mainly by bank classification (KBMI), confirming that larger banks (KBMI 4) have stronger profitability due to greater economies of scale, diversified income, and higher efficiency.

The COVID-19 dummy negatively affects ROA, reflecting the profitability decline during pandemic quarters.

Seasonality effects were also observed, as profitability tends to weaken in later quarters, suggesting cyclical pressures on earnings toward year-end.

Other internal variables (CAR, NPL, BOPO, LDR) exhibit the expected theoretical directions, even though their coefficients are not statistically significant after robust correction.

These findings align with prior studies such as Endri et al. (2020) and Derbali (2021), which found similar mixed significance among CAMEL components in Indonesian and regional banking systems.

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values < 10, with mean VIF = 1.38, confirming no multicollinearity among independent variables. The correlation matrix also shows moderate correlations, with the highest ($r = 0.77$ between ROA and BOPO) being theoretically justified, as higher cost inefficiency lowers profitability.

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 176.85$, Prob > $\chi^2 = 0.0000$, indicating the presence of heteroskedasticity. To correct this issue, robust standard errors were applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 17.33$, Prob = 0.0010, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

2. ROA – Macroeconomy Model

a. Overview

This section analyzes the impact of macroeconomic determinants on bank profitability (ROA) among KBMI 3 and KBMI 4 banks during the period 2020–2024.

The independent variables include GDP growth, inflation rate (INF), consumer confidence index (CCI), business confidence index (BCI), regional wage growth (UMP), Bank Indonesia policy rate (BI), and the exchange rate (JISDOR), alongside the COVID-19 dummy, KBMI classification, and quarterly controls.

b. Model Selection : Hausman Test

The Hausman test shows:

Table 3. Hausman Test Results for ROA – Macroeconomy Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	1.80	10	0.9976	Fail to reject H_0

Since Prob > χ^2 (0.9976) > 0.05, the null hypothesis cannot be rejected, indicating that the Random Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the RE model with robust standard errors.

c. Random Effects Model Results (Robust)

The Random Effects model with robust standard errors clustered by bank was employed to ensure reliability against heteroskedasticity and serial correlation. The model's Wald $\chi^2 = 235.78$ ($p < 0.001$) confirms that all predictors are jointly significant, while the overall $R^2 = 0.40$ suggests that approximately 40% of ROA variation is explained by the independent variables. This variation is justifiable since unlike internal determinants (CAR, NPL, BOPO, etc) that directly affect a bank's balance sheet, macroeconomic indicators influence profitability indirectly through credit demand, costs of funds, and borrower performance.

Based on 5% significant level, the results show that Consumer Confidence Index (CCI) emerges as the most influential determinant, positively and significantly affecting ROA. This suggests that higher consumer optimism drives greater loan demand and spending activity, supporting bank profitability.

In the 10% significant level, Business Confidence Index (BCI) shows a slightly weak negative association with profitability, reflecting corporate caution and slower business expansion during uncertain post-pandemic recovery phases.

In addition, in the 10% significant level, the unemployment rate shows a negative association with bank profitability, as higher unemployment typically weakens household income and reduces credit demand, loan repayment capacity, and overall financial activity. Conversely, a decline in unemployment supports greater intermediation and profitability.

Other macro variables (GDP, Inflation, BI Rate, and USD/IDR Rate) remain statistically insignificant, implying limited short-term sensitivity of profitability to general macroeconomic fluctuations during 2020-2024.

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values ranges varies from 1.03 to 13.66 with mean VIF = 5.32. This is theoretically justified in macroeconomy perspective since some parameters affect another. Covid-19 pandemic, for example, affect GDP and Consumer Confidence Index, while push regulators to adjust BI Rate.

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 0.33$, Prob > $\chi^2 = 0.567$, indicating homoskedasticity confirmed. However, robust standards errors were still applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 43.71$, Prob = 0.0000, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

3. ROA – CAMEL and Macroeconomy Model

a. Overview

To get a more holistic understanding, this section examines the combined effect of internal banking determinants and macroeconomic variables on the ROA of KBMI 3 and KBMI 4 banks in Indonesia from 2020 to 2024. Same method used from the previous models.

b. Model Selection : Hausman Test

The Hausman test compares the FE and RE estimators to determine whether bank-specific effects are correlated with the independent variables.

Table 4. Hausman Test Results for ROA – CAMEL and Macroeconomy Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	90.55	15	0.000	Reject H_0

Since $\text{Prob} > 0.05 > \chi^2$ (0.000), the null hypothesis is rejected, indicating that the Fixed Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the FE model with robust standard errors.

c. Fixed Effects Model Results (Robust)

The Random Effects (RE) model was chosen for the Banking and Macroeconomy Models since Hausman tests ($\text{Prob} > 0.05$) indicated no correlation between bank-specific effects and explanatory variables, making RE efficient and consistent. This is reasonable because internal ratios are standardized across KBMI banks, and macroeconomic indicators are common to all banks each period. However, when both internal and external factors were combined, the Hausman test ($\chi^2 = 90.55$, $p < 0.001$) rejected the RE assumption, so the Fixed Effects (FE) model was applied. This indicates that unobserved characteristics, such as management quality or risk preference, correlate with internal variables, requiring FE to capture within-bank variation—consistent with findings by Endri et al. (2020), Saif-Alyousfi (2020), and Derbali (2021).

The FE model with robust standard errors yielded a within $R^2 = 0.5237$, suggesting that about 52.4% of the variation in ROA within banks over time is explained by the included banking and macroeconomic variables. The F-statistic ($p < 0.001$) confirms joint significance.

Based on 5% significant level, the results show that profitability is influenced by Business Confidence Index; higher business optimism can increase competition and reduce margins, consistent with Moroccan and GCC evidence where overextension reduces profitability (Derbali, 2021; Saif-Alyousfi, 2020). In addition, higher Unemployment Rate weakens credit demand and repayment capacity, reducing bank profitability, consistent with post-Covid findings in China and Europe (Horobet et al., 2021; Zhu & Jin, 2023).

In the 10% significant level, LDR is positive and marginally significant, suggesting that effective loan intermediation and liquidity management enhances profitability, consistent with GCC evidence where strong liquidity management improves performance (Al-Matari, 2021). Meanwhile, Consumer Confidence Index is also positive, means that stronger consumer sentiment encourages credit demand and profitability (Endri et al., 2020).

The Covid-19 dummy showed a negative but insignificant coefficient, implying that the pandemic's direct impact on ROA was already captured by macroeconomic variables such as unemployment and confidence indicators. Evidence from Asian banks

similarly shows profitability declines arising from reduced income and higher defaults during the pandemic (Alsamhi et al., 2022).

The Q4 dummy was marginally negative yet significant in 10% level, reflecting seasonal year-end provisioning and expense recognition.

Internal determinants such as CAR, NPL, and BOPO retained their theoretical directions but were statistically insignificant, confirming results in Asian and Ethiopian contexts where internal efficiency and risk management play secondary roles compared to macroeconomic influences (Endri et al., 2020; Isayas, 2022).

Overall, the evidence suggests that ROA performance during the post-COVID period was driven mainly by macroeconomic recovery and intermediation efficiency, while internal ratios had limited short-term significance.

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values varies from 1.27 to 13.86 with mean $VIF = 4.69$, confirming no multicollinearity among independent variables. Some individual variables, such as Covid (13.86), BI Rate (12.31), GDP (10.96), and CCI (9.89) show relatively high multicollinearity. This pattern is justifiable since it reflects strong correlations among macroeconomic indicators, in which one particular event such as Covid-19, or one regulator policy, affect other macroeconomic parameters. Thus, in this case, the high VIFs don't necessarily indicate a model problem but rather reflect economic co-movements during 2020 – 2024 period. This is supported by previous findings that during 2020 – 2022, GDP Growth, inflation, and policy rates were all simultaneously affected by Covid-19 (Endri et al., 2020; Zhu and Jin, 2023).

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 91.58$, $\text{Prob} > \chi^2 = 0.0000$, indicating the presence of heteroskedasticity. To correct this issue, robust standard errors were applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 32.96$, $\text{Prob} = 0.0001$, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

4. QEPS – Banking Model

a. Overview

This section examines how internal banking determinants — Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Good Corporate Governance (GCG), Operational Efficiency (BOPO), and Loan-to-Deposit Ratio (LDR) — influence Quarterly Earnings per Share (QEPS) for KBMI 3 and KBMI 4 banks from 2020–2024. Control variables include the COVID-19 dummy, KBMI category, and quarterly dummies (Q2–Q4) to capture pandemic shocks, bank group differences, and seasonal patterns.

The regression was estimated using Pooled OLS, Fixed Effects (FE), and Random Effects (RE) models, followed by diagnostic tests for robustness.

Control variables include the COVID-19 dummy, KBMI category, and quarterly dummies (Q2–Q4) to capture pandemic shocks, bank group differences, and seasonal patterns.

b. Model Selection : Hausman Test

The Hausman test compares the FE and RE estimators to determine whether bank-specific effects are correlated with the independent variables.

Table 5. Hausman Test Results for QEPS – Banking Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	8.25	9	0.5089	Fail to reject H_0

Since $\text{Prob} > \chi^2 (0.5089) > 0.05$, the null hypothesis cannot be rejected, indicating that the Random Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the RE model with robust standard errors.

This result aligns with theory, as bank-specific heterogeneity (e.g., management style, governance policy) does not strongly correlate with the internal financial ratios used.

c. Random Effects Model Results (Robust)

The Random Effects model with robust standard errors clustered by bank was employed to ensure reliability against heteroskedasticity and serial correlation. The model's Wald $\chi^2 = 261.91$ ($p < 0.001$) confirms that all predictors are jointly significant, while the overall $R^2 = 0.3910$ suggests that approximately 39.1% of quarterly EPS variation is explained by the independent variables.

Based on 5% significant level, the results show that net Non-Performing Loan is negative and significant, showing that higher credit risk sharply reduces shareholder earnings. This indicates that increased non-performing loans lower profitability and dividend capacity, consistent with results in Ethiopia and CEE Countries (Isayas, 2022; Horobet et al., 2021).

KBMI is positive and significant, implying implying that banks in higher KBMI categories (especially KBMI 4) generate greater QEPS, reflecting economies of scale, stronger capitalization, and better diversification. This aligns with previous study which found that large, well-capitalized banks achieve superior shareholder returns (Gupta & Mahakud, 2020)

Q2 dummy is negative and significant, indicating that second-quarter EPS tends to decline, potentially due to seasonal expense adjustments, dividends disbursements, or provisioning patterns.

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values < 10 , with mean VIF = 1.38, confirming no multicollinearity among independent variables.

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 168.42$, $\text{Prob} > \chi^2 = 0.0000$, indicating the presence of heteroskedasticity. To correct this issue, robust standard errors were applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 62.01$, $\text{Prob} = 0.0000$, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

5. QEPS – Macroeconomy Model

a. Overview

This model evaluates the impact of GDP, inflation (INF), consumer confidence (CCI), business confidence (BCI), unemployment (UMP), BI rate, and exchange rate (JISDOR)—plus COVID-19, KBMI class, and quarter dummies (Q2–Q4)—on quarterly EPS (QEPS) of KBMI 3–4 banks (2020–2024). We estimate Pooled OLS, FE, and RE, then apply cluster-robust inference.

b. Model Selection : Hausman Test

The Hausman test compares the FE and RE estimators to determine whether bank-specific effects are correlated with the independent variables.

Table 6. Hausman Test Results for QEPS – Macroeconomy Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	0.25	10	1.000	Fail to reject H_0

Since $\text{Prob} > \chi^2 (0.25) > 0.05$, the null hypothesis cannot be rejected, indicating that the Random Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the RE model with robust standard errors. This result aligns with theory, as bank-specific heterogeneity (e.g., management style, governance policy) does not strongly correlate with the internal financial ratios used.

c. Random Effects Model Results (Robust)

The Random Effects model with robust standard errors clustered by bank was employed to ensure reliability against heteroskedasticity and serial correlation. The model's Wald $\chi^2 = 1511.14$ ($p < 0.001$) confirms that all predictors are jointly significant, while the overall $R^2 = 0.3727$ suggests that approximately 37.3% of quarterly EPS variation is explained by the independent variables.

Based on 5% significant level, the results show that KBMI, Unemployment Rate, and Q2 dummy is significant. The significant impact of KBMI and Q2 dummy to Quarterly EPS has been explained in banking model, while Unemployment Rate is significant and positively impacted QEPS. The reason of this might be that during during weak labor market conditions, large banks (especially KBMI 4) maintained or improved per-share earnings through cost efficiency, balance-sheet repricing, and portfolio adjustments. This reflects resilience amid macro stress and aligns with findings that well-capitalized banks can sustain profitability during downturns through internal efficiency and policy support (Saif-Alyousfi, 2020; Horobet et al., 2021).

In the 10% confidence level, BI rate showed a slightly significant yet negative effect, means that interest rate hikes tend to pressure QEPS by increasing funding costs and compressing margins, though the effect was not uniform across quarters. This is consistent with evidence that tighter monetary policy can weaken bank earnings when funding reprices faster than lending rates (Derbali, 2021; Isayas, 2022).

GDP, Inflation, CCI, and BCI in this model testing is insignificant; consistent with studies showing macroelasticities can be muted once bank size and fixed bank characteristics are accounted for, especially during pandemic and recovery phase (Saif-Alyousfi, 2020; Derbali, 2021).

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values varies from 1.03 to 13.66 with mean VIF = 5.32. This condition is similar and has been explained in the analysis of ROA toward macroeconomy indicators.

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 141.07$, $\text{Prob} > \chi^2 = 0.0000$, indicating the presence of heteroskedasticity. To correct this issue, robust standard errors were applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 41.38$, $\text{Prob} = 0.0000$, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

6. QEPS – CAMEL and Macroeconomy Model

a. Overview

Similar with testing ROA, to get a more holistic understanding, this section examines the combined effect of internal banking determinants and macroeconomic variables on the QEPS of KBMI 3 and KBMI 4 banks in Indonesia from 2020 to 2024.

b. Model Selection : Hausman Test

The Hausman test compares the FE and RE estimators to determine whether bank-specific effects are correlated with the independent variables.

Table 7. Hausman Test Results for QEPS – CAMEL and Macroeconomy Model

Test Statistic	Chi-square (χ^2)	Degrees of Freedom	Prob > χ^2	Decision
Hausman Test	6.96	13	0.9040	Fail to Reject H_0

Since Prob > χ^2 (0.9040) > 0.05, fail to reject the null hypothesis is rejected, indicating that the Random Effects model is the more efficient and consistent estimator. Therefore, subsequent analysis is based on the RE model with robust standard errors.

c. Random Effects Model Results (Robust)

The Random Effects model with robust standard errors clustered by bank was employed to ensure reliability against heteroskedasticity and serial correlation. The model's Wald $\chi^2 = 57.94$ ($p < 0.000$), reported under non robust run, confirms that all predictors are jointly significant, while the overall $R^2 = 0.409$ suggests that approximately 40.9% of quarterly EPS variation is explained by the independent variables.

Based on 5% significant level, credit risk dominates QEPS as shown in the net Non-Performing Loan. A one-unit rise in NPL materially lowers QEPS, echoing cross-market evidence that asset quality is the primary profitability drag (Isayas, 2022; Horobet et al., 2021).

Bank scale is also matter as KBMI 4 banks positively indicates economies of scale, stronger capitalization, and diversification that lift shareholder returns (Gupta & Mahakud, 2020). Meanwhile, Q2 negative effect also suggest interim provisioning, dividend payments, or expense time that suppresses quarterly EPS.

Macro factors like GDP, Inflation, CCI, BCI, Unemployment Rate, BI Rate, and USD/IDR Rate turn insignificant when CAMEL and KBMI are controlled. This is consistent with regional findings that bank size and asset quality overshadow broad macro signals for bank-level earnings (Saif-Alyousfi, 2020; Horobet et al., 2021).

d. Classical Assumption Tests

In Multicollinearity test, VIF analysis indicates all values varies from 1.27 to 13.86 with mean VIF = 4.69. Simiar with the explanation in testing ROA with internal and external factors, high VIFs reflect expected macro co-movement, while core bank variables are well-behaved.

In Heteroskedasticity Test, The Breusch–Pagan/Cook–Weisberg test reports $\chi^2(1) = 160.16$, Prob > $\chi^2 = 0.0000$, indicating the presence of heteroskedasticity. To correct this issue, robust standard errors were applied, ensuring consistent coefficient estimates.

In the serial correlation test, the Wooldridge-style residual test shows $F(1,14) = 43.29$, Prob = 0.0000, confirming serial correlation. Thus, the study employed clustered robust errors by bank, which simultaneously address both heteroskedasticity and autocorrelation in panel data.

Discussions

Highlight of The Findings

The regression analyses across six model specifications reveal consistent and theoretically coherent patterns regarding the internal and external determinants of bank performance in Indonesia's KBMI 3 and 4 banks during the post-COVID-19 period.

For the ROA–Banking model, results indicate that profitability is largely shaped by bank classification (KBMI), showing that larger banks benefit from economies of scale, product diversification, and stronger balance sheet structures. The pandemic period, captured by the COVID-19 dummy, demonstrates a negative association with profitability, reflecting temporary declines in banking activities and heightened credit risks. Seasonality effects were also observed, as profitability tends to weaken in later quarters, suggesting cyclical pressures on earnings toward year-end.

The ROA–Macroeconomic model underscores the influence of the broader economic environment on bank profitability. Consumer Confidence Index (CCI) emerges as the most influential determinant, suggest that higher consumer optimism drives greater loan demand and spending activity, supporting bank profitability. In the 10% significant level, Unemployment Rate shows negative effect, implying that weak labor markets reduce credit demand and loan repayment capacity, thereby lowering returns. Business Confidence also appears to move inversely with ROA, suggesting that periods of heightened optimism may intensify competition and compress margins. Overall, consumer optimism, business confidence, and labor market strength remain crucial external supports for bank profitability.

When banking and macroeconomic variables are combined in the ROA–Integrated model, both internal efficiency and external stability emerge as joint determinants of profitability. Based on 5% significant level, profitability is influenced by Business Confidence Index, as higher business optimism can increase competition and reduce margins. Unemployment rate also negatively impacts ROA as it weakens credit demand and repayment capacity. In the 10% significant level, LDR is positively associated with ROA, indicating that well-calibrated lending growth enhances returns when supported by sound credit discipline. Consumer Confidence Index is also significant and positive, means that stronger consumer sentiment encourages credit demand and profitability. Q4 dummy was also significant, reflecting seasonal year-end provisioning and expense recognition. The fixed-effects estimation confirms that bank-specific characteristics—such as governance and strategy—play a meaningful role in explaining profitability differences across institutions.

Turning to shareholder performance, the QEPS–Banking model demonstrates patterns consistent with ROA findings. Larger banks (KBMI-4) exhibit significantly higher earnings per share, reflecting the benefits of scale, cost efficiency, and diversified income sources. Net NPL is negative and significant, showing that higher credit risk sharply reduces shareholder earnings. Q2 dummy is also significant, indicating that second-quarter EPS tends to decline, potentially due to seasonal expense, dividends, or provisioning.

In the QEPS–Macroeconomic model, the results highlight the ability of large Indonesian banks to maintain earnings resilience amid shifting macro conditions. The significant impact of KBMI and Q2 dummy to Quarterly EPS has been explained in banking model. Unemployment shows a positive and highly significant coefficient, reflecting how, during this period, large banks preserved per-share earnings through operational discipline and portfolio optimization despite labor market softness. In the 10% confidence level, the BI rate exhibits a mild negative effect, suggesting that rising interest rates can pressure earnings through higher funding costs. Other macro indicators, such as inflation, GDP, CCI, and BCI have limited direct influence, consistent with earlier evidence that bank-specific management plays a stronger role than external cycles in short-term earnings performance.

Finally, the QEPS–Integrated model confirms that both internal and external factors interact to shape shareholder returns. Net NPL materially lower QEPS, similar with findings that asset quality is the primary profitability drag. Similar with previous model, KBMI and Q2 are statistically significant. In this model, macro factors are insignificant; consistent with regional findings that bank size and asset quality overshadow macro indicators for bank-level earnings. Though less significant, in several models the results suggest that stable

macroeconomic conditions along with efficient cost structures and prudent balance sheet management jointly drive earnings growth in the post-pandemic period.

Across all models, the overarching conclusion is that efficiency, scale, and macroeconomic resilience are the key pillars of bank performance. Internal determinants—particularly NPL, KBMI, seasonal period, and LDR—exert the most consistent and economically meaningful influence, while external factors such as CCI, BCI, Unemployment Rates, and BI Rate affect profitability primarily through credit quality and cost of funds. These findings reinforce that the sustainability of profitability in KBMI 3–4 banks depend not only on maintaining operational discipline but also on adapting strategically to evolving macroeconomic conditions.

Business Solution

The empirical findings suggest that the performance of KBMI 3–4 banks after the COVID-19 pandemic is primarily influenced by scale, credit quality, lending and seasonal strategy, macroeconomic confidence, unemployment rate, and BI Rate. These findings brings insights to multiple stakeholders within Indonesia financial ecosystem:

For Bank Management, the results highlight the need to strengthen credit-risk governance and loan portfolio management, since NPL negatively affects both ROA and QEPS. Maintaining prudent lending growth (as reflected by the positive but moderate impact of LDR) can improve profitability when supported by effective underwriting standards. Banks should also plan for seasonal fluctuations, particularly the observed Q2 and Q4 declines in earnings, by smoothing provisioning and liquidity management throughout the year.

For Shareholders and Investors, the findings confirm that bank size and stability are reliable indicators of sustained returns. The positive effect of KBMI classification on both ROA and QEPS implies that well-capitalized banks with broad market coverage are better positioned to deliver consistent earnings despite macroeconomic fluctuations. Investors should therefore value prudent growth and strong asset quality as much as headline profitability.

For Employees, strong profitability and financial stability enhance job security, fair compensation, and professional development opportunities. Larger KBMI 4 banks, benefiting from economies of scale, can allocate more resources to training, digital upskilling, and performance-based rewards. Stable earnings also enable banks to maintain employment levels during macroeconomic fluctuations, fostering workforce resilience and long-term career growth.

For Regulators (OJK and Bank Indonesia), the sensitivity of profitability to macro indicators such as Unemployment and the BI Rate underscores the importance of aligning monetary policy with financial-sector stability. Rate adjustments that preserve manageable funding costs and promote credit expansion can indirectly support profitability without encouraging excessive risk-taking. Continuous supervision of NPL ratios and stress-testing for interest-rate risk remain vital to safeguard earnings quality.

For Policy Makers and the Government, the mixed influence of Consumer Confidence (CCI) and Business Confidence (BCI) and the negative effect of unemployment highlight the interdependence between the real economy and banking performance. Policies that stimulate job creation, household purchasing power, and overall economic sentiment will improve credit demand and repayment capacity, reinforcing financial stability.

For Borrowers and Customers, the findings imply potential benefits from improved lending stability and macro-policy coordination. When banks maintain healthy balance sheets and sound risk management, they can offer more predictable credit access and stable interest margins, especially during economic downturns. Lower NPL ratios and better liquidity management reduce default-driven tightening, allowing productive borrowers—particularly MSMEs and households—to secure financing at reasonable terms.

Overall, these results indicate that the key business solution lies in strengthening credit-risk control, maintaining optimal lending ratios, managing macro sensitivity, and leveraging scale advantages. By integrating sound internal risk management with coordinated macroeconomic policy, Indonesia's KBMI 3–4 banks can achieve sustainable profitability and enhance stakeholder value in the post-pandemic environment.

Implementation Plan & Justification

The implementation plan translates the empirical findings and business solutions into a series of actionable strategies designed to enhance profitability, stability, and inclusivity in Indonesia's KBMI 3 and 4 banks. The plan adopts a phased approach—short-term, medium-term, and long-term—to ensure feasibility, policy alignment, and sustained impact across all stakeholders.

1. Short-Term (0-1 Year): Strengthening Operational and Risk Foundations

- a. Evaluate loan portfolio, NPL quality, potential lending growth, potential deposit growth, and seasonal expense, in order to maintain and improve the quality of NPL, LDR, and seasonal expense.
- b. Introduce seasonal liquidity planning frameworks to mitigate Q2 and Q4 earnings volatility
- c. Initiate employee upskilling programs focused on digital lending, data analytics, and risk frameworks.

Justification - These short-term actions address the most immediate internal determinants affecting performance. The regression results show that NPL negatively and LDR positively influence profitability, indicating that maintaining prudent credit quality while expanding lending is key. Upskilling employees ensures operational adaptability and builds the foundation for long-term digital transformation.

2. Medium-Term (2-3 Year): Enhancing Scale Efficiency and Market Resilience

- a. Expand digital banking platforms and automation systems to achieve scale efficiencies.
- b. Strengthen loan diversification, focus on promoting yet stable segments, such as SMEs and Commercial segment, to improve market reach and reduce concentration risk.
- c. Promote borrower education initiatives, helping clients manage loan responsibly and improve repayment capacity. This would help in segments like Micro and SMEs, since many borrowers there need repayment guidance.

Justification – Result findings highlight that KBMI scale (size) significantly improves both ROA and QEPS, confirming that larger, diversified banks perform better. Meanwhile, macroeconomic indicators such as unemployment and the BI rate affect returns, requiring proactive coordination between banks and regulators. Empowering employees through performance-based incentives and financial literacy initiatives for borrowers ensures long-term efficiency and responsible lending growth.

3. Medium-Term (3-5 Year): Building Sustainable and Inclusive Growth

- a. Institutionalize integrated risk management frameworks that combine internal (CAMEL) and external (macroeconomic) indicators for strategic planning.
- b. Support policy-driven credit inclusion through collaboration with government programs aimed at employment creation and MSME empowerment.
- c. Foster a culture of continuous learning among employees through advanced certification and leadership programs.
- d. Establish sustainability-linked performance metrics, aligning profitability goals with social and environmental responsibility.

Justification - The integration of internal and external determinants in the combined ROA and QEPS models underscores the importance of linking bank-specific efficiency with

macro stability. Long-term growth depends on synergy between corporate governance, workforce development, and economic inclusion.

CONCLUSION

Based on the empirical analysis, this study concludes that the financial performance of Indonesia's major banks (KBMI 3 and 4) during the post-COVID-19 period (2020-2024) is predominantly driven by internal determinants, specifically credit quality (NPL), intermediation efficiency (LDR), and bank scale (KBMI classification). While external macroeconomic factors such as consumer confidence, unemployment, and the BI rate play a secondary role, they nonetheless interact with internal efficiency to shape profitability (ROA) and shareholder value (QEPS). This underscores that robust risk management, operational discipline, and strategic scale advantages are the primary pillars of sustainable banking performance, even amidst economic fluctuations. For future research, it is recommended to expand the scope to include dynamic panel models that can better account for profit persistence, incorporate non-financial banks or Islamic banks for comparative analysis, and integrate more granular data on digital transformation metrics and environmental, social, and governance (ESG) factors to explore their emerging influence on bank resilience and value creation.

REFERENCES

- Al-Matari, E. M. (2023). The determinants of bank profitability of GCC: The role of bank liquidity as moderating variable—Further analysis. *International Journal of Finance and Economics*, 28(2), 1423–1435. <https://doi.org/10.1002/ijfe.2485>
- Alsamhi, M. H., Al-Ofairi, F. A., Farhan, N. H. S., Al-ahdal, W. M., & Siddiqui, A. (2022). Impact of Covid-2019 on firms' performance: Empirical evidence from India. *Cogent Business and Management*, 9(1). <https://doi.org/10.1080/23311975.2022.2044593>
- Anestiawati, C. A., Amanda, C., Khantinyano, H., & Agatha, A. (2025). Bank FinTech and credit risk: Comparison of selected emerging and developed countries. *Studies in Economics and Finance*.
- Challoumis, C. (2024). Minimum escaped savings and financial liquidity in mathematical representation. *Ekonomski Signali: Poslovni Magazin*, 19(1), 1–18.
- Chibueze, T. (2025). Leveraging strategic partnerships to expand msme financial inclusion and strengthen access to affordable, sustainable cooperative banking services. *International Journal Of Engineering Technology Research & Management (IJETRM)*. 2025Aug31, 7(12), 580–599.
- Dashkevich, N., Counsell, S., & Destefanis, G. (2024). Blockchain financial statements: innovating financial reporting, accounting, and liquidity management. *Future Internet*, 16(7), 244.
- Derbali, A. (2021). Determinants of the performance of Moroccan banks. *Journal of Business and Socio-Economic Development*, 1(1), 102–117. <https://doi.org/10.1108/JBSSED-01-2021-0003>
- Endri, E., Marlina, A., & Hurriyaturrohman. (2020). Impact of internal and external factors on the net interest margin of banks in Indonesia. *Banks and Bank Systems*, 15(4), 99–107. [https://doi.org/10.21511/bbs.15\(4\).2020.09](https://doi.org/10.21511/bbs.15(4).2020.09)

- Ermawati, Y. (2024). The Role of Corporate Finance in Maximizing Shareholder Wealth and Driving Sustainable Growth. *Advances in Management & Financial Reporting*, 2(3), 173–185.
- Gaviyau, W., & Godi, J. (2025). Banking Sector Transformation: Disruptions, Challenges and Opportunities. *FinTech*, 4(3), 48.
- Gupta, N., & Mahakud, J. (2020). Ownership, bank size, capitalization and bank performance: Evidence from India. *Cogent Economics and Finance*, 8(1). <https://doi.org/10.1080/23322039.2020.1808282>
- Horobet, A., Radulescu, M., Belascu, L., & Dita, S. M. (2021). Determinants of Bank Profitability in CEE Countries: Evidence from GMM Panel Data Estimates. *Journal of Risk and Financial Management*, 14(7). <https://doi.org/10.3390/jrfm14070307>
- Iqbal, N., Kryeziu, N., Abonazel, M. R., Harymawan, I., Mai, G., Yuan, D., Abu Issa Gazi, M., Kumar Dhar, B., & Ishaque Hossain, A. (n.d.). *Profitability determining factors of banking sector: Panel data analysis of commercial banks in South Asian countries*.
- Isayas, Y. N. (2022). Determinants of banks' profitability: Empirical evidence from banks in Ethiopia. *Cogent Economics and Finance*, 10(1). <https://doi.org/10.1080/23322039.2022.2031433>
- Jameaba, M.-S. (2024). Digitalization, emerging technologies, and financial stability: challenges and opportunities for the Indonesian banking sector and beyond. *Emerging Technologies, and Financial Stability: Challenges and Opportunities for the Indonesian Banking Sector and Beyond* (April 26, 2024).
- Kandpal, V., Ozili, P. K., Jeyanthi, P. M., Ranjan, D., & Chandra, D. (2025). Factors Reshaping the Digital Banking Sectors. In *Digital Finance and Metaverse in Banking: Decoding a Virtual Reality towards Financial Inclusion and Sustainable Development* (pp. 33–67). Emerald Publishing Limited.
- Okaro, H. E. (2025). Evaluating the Long-Term Macroeconomic Implications of Central Bank Digital Currencies on Global Financial Intermediation and Sovereign Monetary Autonomy. *Journal Homepage: Yvww. Ijrpr. Com ISSN*, 2582, 7421.
- Rosenzweig, H., & Julia, T. (2025). *ESG Impact on Swedish Financial Performance: Sustainable Investing and Stock Returns: A Quantitative Study of ESG in Sweden*.
- Semanne, A. (2025). Small businesses under siege: Austrian perspectives on COVID-19 regulations and their impact on SMEs in France. *The Review of Austrian Economics*, 1–31.
- Strekalina, A., Zakirova, R., Shinkarenko, A., & Vatsaniuk, E. (2023). The impact of ESG ratings on financial performance of the companies: Evidence from BRICS countries. *Корпоративные Финансы*, 17(4), 93–113.
- Wang, Z. (2025). Navigating the Regulatory Capital Landscape: Indonesia's Alignment with Global Banking Standards. *Available at SSRN 5124301*.
- Xu, X., Xia, Y., Qiu, A., Choi, M., & Park, J. (2024). A study on overseas chinese bank in Indonesia-focusing on bank central asia. *International Journal of Religion*, 5(4), 492–501.
- Zhu, Y., & Jin, S. (2023). COVID-19, Digital Transformation of Banks, and Operational Capabilities of Commercial Banks. *Sustainability (Switzerland)*, 15(11). <https://doi.org/10.3390/su15118783>