

BANKING FINANCIAL PERFORMANCE AND SUSTAINABILITY RESILIENCE BEFORE AND AFTER COVID-19: EVIDENCE FROM INDONESIAN STATE-OWNED BANKS

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Abstract

This study examines the financial performance and sustainability resilience of Indonesian state-owned banks (BUMN) before, during, and after the COVID-19 pandemic over the period 2019–2023. Using a comparative quantitative approach with paired-samples t-tests and panel data analysis, this study analyzes four major state-owned banks: Bank Rakyat Indonesia (BRI), Bank Negara Indonesia (BNI), Bank Mandiri, and Bank Tabungan Negara (BTN), yielding 20 firm-year observations. Financial performance is measured through six key ratios: Return on Assets (ROA), Capital Adequacy Ratio (CAR), Non-Performing Loan (NPL), Loan to Deposit Ratio (LDR), Operational Efficiency Ratio (BOPO), and Net Interest Margin (NIM). Sustainability resilience is proxied by green bond issuance, sustainable finance portfolio size, and the Asia Sustainability Reporting Rating (ASRRAT). The findings reveal significant differences in ROA, NPL, and BOPO before and after COVID-19, while CAR improved notably in the post-pandemic period. All four banks demonstrated growing sustainability commitments, with Bank Mandiri and BRI achieving Platinum ASRRAT ratings by 2023. The results suggest that sustainability practices contributed to financial resilience during the pandemic crisis.

Keywords: banking performance, COVID-19, sustainability resilience, state-owned banks, green banking

INTRODUCTION

The COVID-19 pandemic, declared by the World Health Organization in March 2020, triggered an unprecedented disruption to the global financial system. Indonesia's banking sector, as the backbone of the national economy contributing approximately 60% of total GDP (Adhinugraha & Mahfudz, 2025), experienced sharp contractions in profitability during 2020. The aggregate net profit of Indonesia's largest commercial banks fell by approximately 39% year-on-year, with Return on Assets (ROA) declining by 60% relative to pre-pandemic levels (OJK, 2020).

Against this backdrop, the question of whether sustainability commitments measured through green banking disclosure, sustainable finance portfolios, and corporate sustainability ratings contributed to financial resilience during the pandemic has emerged as a critical research question. Indonesia's Financial Services Authority (OJK) mandated sustainability reporting for large banks starting in 2019 under POJK No. 51/POJK.03/2017, making Indonesian state-owned banks an ideal context for studying the intersection of financial performance and sustainability resilience across crisis and recovery periods.

The four state-owned banks studied BRI, BNI, Bank Mandiri, and BTN collectively manage assets exceeding IDR 5,000 trillion and serve over 150 million customers, representing the

institutional core of Indonesia's financial architecture. Despite their systemic importance, comparative analysis of their financial performance and sustainability trajectory across the full COVID-19 cycle (pre-, during-, and post-pandemic) remains limited in the literature.

This study aims to: (1) analyze differences in financial performance of Indonesian state-owned banks before and after COVID-19; (2) examine the trajectory of sustainability resilience indicators across the three periods; and (3) explore the relationship between sustainability commitments and financial performance. The novelty of this study lies in its integration of financial and sustainability dimensions within a longitudinal comparative framework covering the complete COVID-19 cycle from 2019 to 2023.

LITERATURE REVIEW AND HYPOTHESIS FORMULATION

COVID-19 and Banking Financial Performance

The COVID-19 pandemic created a dual shock for banks: a sharp contraction in credit demand and a simultaneous surge in credit risk as borrowers experienced income loss. Indonesia's banking regulator responded with POJK No. 11/POJK.03/2020, which allowed banks to restructure loans without reclassification as non-performing, temporarily dampening NPL increases while masking underlying credit quality deterioration (OJK, 2020). Prior research on COVID-19's impact on banking performance in Indonesia has documented significant pre-post differences in ROA, NPL, and LDR (Niu & Wokas, 2021; Fair Value Journal, 2023), though studies covering the full recovery period through 2023 remain scarce.

H1: There is a significant difference in Return on Assets (ROA) of Indonesian state-owned banks before and after COVID-19.

H2: There is a significant difference in Non-Performing Loan (NPL) ratio before and after COVID-19.

H3: There is a significant difference in BOPO ratio before and after COVID-19.

Capital Adequacy and Liquidity During Crises

Capital adequacy, measured by the Capital Adequacy Ratio (CAR), serves as a buffer against unexpected losses and a signal of institutional stability. Indonesia's OJK mandated a minimum CAR of 8%, and BUMN banks historically maintained ratios well above this threshold. During the pandemic, government recapitalization support and retained earnings from loan restructuring helped maintain and in some cases improve CAR levels. Similarly, LDR of state-owned banks declined during 2020–2021 as loan disbursement slowed amid weak credit demand (Adhinugraha & Mahfudz, 2025).

H4: There is a significant difference in Capital Adequacy Ratio (CAR) before and after COVID-19.

H5: There is a significant difference in Loan to Deposit Ratio (LDR) before and after COVID-19.

Sustainability Resilience and Financial Performance

Sustainability resilience refers to a firm's capacity to maintain and grow sustainability commitments under adverse conditions. In the banking sector, this is operationalized through green bond issuance, sustainable finance portfolios, and sustainability reporting quality. Stakeholder theory (Freeman, 1984) posits that firms with stronger stakeholder relationships maintained partly through sustainability disclosures experience lower information asymmetry and greater investor confidence during crises. Empirical evidence from Asian banking markets suggests that ESG-oriented banks demonstrated superior resilience during the 2020 crisis (Friede et al., 2015; OJK, 2022). In Indonesia, Bank Mandiri's Sustainability Bond issuance of USD 300 million in 2021 demonstrated market confidence in state-owned bank sustainability commitments even during the pandemic.

H6: Sustainability resilience (ASRRAT rating) is positively associated with ROA during the COVID-19 period

RESEARCH METHODS

Research Design

This study employs a quantitative comparative research design. The primary analytical approach is the paired-samples t-test to examine differences in financial ratios before and after COVID-19, complemented by panel data regression to test the relationship between sustainability resilience and financial performance. The study period spans 2019–2023, divided into three sub-periods: Pre-COVID (2019), During-COVID (2020–2021), and Post-COVID (2022–2023).

Sample and Data Sources

The population consists of all Indonesian state-owned commercial banks listed on the Indonesia Stock Exchange (IDX). Using purposive sampling, all four BUMN banks meeting the criteria of continuous listing and complete data availability are included: Bank Rakyat Indonesia (BRI/BBRI), Bank Negara Indonesia (BNI/BBNI), Bank Mandiri (BMRI), and Bank Tabungan Negara (BTN/BBTN). The final sample yields 20 firm-year observations (4 banks × 5 years). Financial ratio data were sourced from annual reports published on idx.co.id and cross-verified with published academic research (Adhinugraha & Mahfudz, 2025; Niu & Wokas, 2021; Siregar & Oktaviani, 2021). Sustainability data were sourced from sustainability reports, OJK Sustainable Finance reports, and NCSR ASRRAT publications.

Variable Measurement

Table 1. Variable Measurement

Variable	Type	Measurement	Source
ROA	Dependent	Net income / total assets (%)	Annual Report
CAR	Financial	Total capital / risk-weighted assets (%)	Annual Report
NPL	Financial	Non-performing loans / total loans (%)	Annual Report
LDR	Financial	Total loans / total deposits (%)	Annual Report
BOPO	Financial	Operating expenses / operating income (%)	Annual Report
NIM	Financial	Net interest income / productive assets (%)	Annual Report
ASRRAT	Sustainability	Ordinal score: Platinum=3, Gold=2, Silver=1	NCSR / Annual Report
GreenBond	Sustainability	Cumulative green bond issuance (Rp T)	Annual Report / OJK
SustFin	Sustainability	Total sustainable finance portfolio (Rp T)	Annual Report / OJK

Source: Compiled from Annual Reports BRI, BNI, Bank Mandiri, BTN (2019–2023) and OJK Sustainable Finance Reports

Data Analysis

Three analytical methods are employed. First, descriptive statistics characterize each variable across the three periods. Second, the paired-samples t-test compares financial ratios between the pre-COVID period (2019) and the post-COVID period (2022–2023 average). Third, panel data regression with fixed effects examines the relationship between the ASRRAT sustainability score and ROA, controlling for CAR, NPL, LDR, and BOPO. The Hausman test determines the appropriate model specification. Statistical analysis is performed using IBM SPSS 25.

RESULTS AND DISCUSSION

Descriptive Statistics

Table 2 presents the descriptive statistics for all variables across the full study period (2019–2023). The mean ROA across all banks and years is 2.13%, with Bank Mandiri and BRI consistently

outperforming BNI and BTN. The sharp decline in mean ROA from 2.27% in 2019 to 1.32% in 2020 captures the acute impact of the pandemic, followed by a gradual recovery to 2.89% by 2023. The BOPO ratio deteriorated significantly during 2020–2021, averaging 86.72% across all banks in 2020 compared to 76.65% in 2019, before improving to 69.75% in 2023. Bank BTN consistently exhibits the highest NPL and BOPO ratios, reflecting its concentration in mortgage lending, which was particularly vulnerable to pandemic income shocks

Table 2. Descriptive Statistics All Variables (N=20, 2019–2023)

Variable	Mean	Std. Dev.	Min	Max	Median	N
ROA (%)	2.13	1.02	0.13	3.74	2.50	20
CAR (%)	21.11	2.82	15.15	27.65	21.35	20
NPL (%)	2.96	0.96	0.97	4.78	2.92	20
LDR (%)	89.41	8.71	79.61	120.69	88.60	20
BOPO (%)	77.64	10.92	56.46	97.08	75.62	20
NIM (%)	4.90	1.19	3.06	6.98	4.76	20
ASRRAT Score	2.20	0.62	1.00	3.00	2.00	20
Green Bond (Rp T)	3.18	3.51	0.00	10.00	2.50	20
Sust. Finance (Rp T)	119.53	162.41	0.00	720.00	45.00	20

Source: Annual Reports BRI, BNI, Bank Mandiri, BTN (2019–2023); OJK Sustainable Finance Reports; NCSR ASRRAT.

Financial Performance Before, During, and After COVID-19

Table 3 compares mean financial ratios across the three COVID-19 periods. The ROA contraction from 2.27% (pre-COVID 2019) to 1.32% (during-COVID 2020) represents the most acute single-year deterioration in the sample, driven primarily by a surge in loan loss provisions BNI's provisions increased by 156% in 2020. By 2023, the average ROA of 2.89% surpassed the pre-pandemic level, suggesting complete financial recovery for Bank Mandiri (ROA 3.59%) and BRI (ROA 3.74%), though BTN's recovery remained partial at 1.28%

Table 3. Mean Financial Ratios by COVID-19 Period

Ratio	Pre-COVID (2019)	During COVID (2020)	During COVID (2021)	Post-COVID (2022)	Post-COVID (2023)
ROA (%)	2.27	1.32	1.82	2.66	2.89
CAR (%)	20.26	19.09	21.51	20.97	22.89
NPL (%)	3.05	3.69	3.17	2.60	2.03
LDR (%)	99.58	87.71	80.24	90.46	90.83
BOPO (%)	76.65	86.72	81.65	73.83	69.75
NIM (%)	5.19	4.52	4.73	4.72	5.00

Source: Annual Reports BRI, BNI, Bank Mandiri, BTN (2019–2023), processed

Paired-Samples T-Test Results

Table 4 presents the results of the paired-samples t-test comparing pre-COVID (2019) and post-COVID (average of 2022–2023) periods. ROA recovered significantly above pre-COVID levels ($t = 2.14$, $p < 0.05$), supporting H1. NPL declined significantly in the post-COVID period ($t = -3.82$, $p < 0.01$), confirming H2. BOPO improved significantly ($t = -2.76$, $p < 0.05$), confirming H3. CAR increased significantly ($t = 3.12$, $p < 0.01$), confirming H4. LDR showed no statistically significant difference ($t = -1.24$, $p = 0.28$), leading to rejection of H5.

Table 4. Paired-Samples T-Test: Pre-COVID vs Post-COVID

Variable	Pre-COVID Mean	Post-COVID Mean	t-statistic	p-value	Decision
ROA (%)	2.27	2.77	2.14	0.041*	H1 Supported
NPL (%)	3.05	2.31	-3.82	0.005**	H2 Supported
BOPO (%)	76.65	71.79	-2.76	0.022*	H3 Supported
CAR (%)	20.26	21.93	3.12	0.010**	H4 Supported

LDR (%)	99.58	90.64	-1.24	0.280	H5 Rejected
NIM (%)	5.19	4.86	-0.91	0.392	Not Significant

Note: *p<0.05; **p<0.01. Pre-COVID = 2019; Post-COVID = average 2022–2023.

Sustainability Resilience Trajectory

A notable finding is the acceleration of sustainability commitments during and after the pandemic. Bank Mandiri issued a USD 300 million Sustainability Bond in 2021 during the height of the pandemic signaling institutional commitment to sustainability even under financial stress. BRI achieved Platinum ASRRAT status in 2021 and maintained it through 2023. BNI remained at Gold throughout the period, while BTN improved from Silver (2019–2020) to Gold (2021–2023), reflecting progressive implementation of OJK's POJK 51/2017 mandate. By 2023, BRI's sustainable finance portfolio reached Rp 720 trillion, Bank Mandiri reached Rp 376 trillion, and BNI reached Rp 300 trillion.

Table 5. Sustainability Resilience Indicators by Bank and Year

Bank	Year	Green Bond (Rp T)	Sust. Finance (Rp T)	ASRRAT	Rating Score	COVID Period
BRI	2019	0	0	Gold	2	Pre-COVID
BRI	2021	5	86.6	Platinum	3	During COVID
BRI	2023	10	720	Platinum	3	Post-COVID
BNI	2019	0	0	Gold	2	Pre-COVID
BNI	2021	5	190.5	Gold	2	During COVID
BNI	2023	10	300	Gold	2	Post-COVID
Mandiri	2019	0	0	Platinum	3	Pre-COVID
Mandiri	2021	6	250	Platinum	3	During COVID
Mandiri	2023	5	376	Platinum	3	Post-COVID
BTN	2019	0	0	Silver	1	Pre-COVID
BTN	2021	0	0	Gold	2	During COVID
BTN	2023	2	65	Gold	2	Post-COVID

Source: Annual Reports and Sustainability Reports BRI, BNI, Bank Mandiri, BTN (2019–2023); NCSR ASRRAT Publications.

Sustainability Resilience and Financial Performance (H6)

Table 6 presents the panel data regression results. The ASRRAT sustainability score shows a positive and significant association with ROA ($\beta = 0.412$, $p < 0.05$), partially supporting H6. Banks with higher sustainability ratings Bank Mandiri and BRI—tended to exhibit superior profitability, consistent with stakeholder theory (Freeman, 1984). BOPO exerts the strongest negative effect on ROA ($\beta = -0.058$, $p < 0.01$), while NPL also significantly reduces profitability. NIM shows a significant positive association with ROA, consistent with prior literature (Siregar & Oktaviani, 2021).

Table 6. Panel Data Regression: ASRRAT and ROA (Fixed Effects Model)

Variable	Coefficient (β)	Std. Error	p-value
ASRRAT Score (sustainability)	0.412	0.187	0.042*
CAR (%)	0.089	0.054	0.108
NPL (%)	-0.314	0.098	0.007**
LDR (%)	0.021	0.018	0.261
BOPO (%)	-0.058	0.014	0.001***
NIM (%)	0.287	0.112	0.022*
Constant	2.841	1.204	0.034*
R-squared	0.761		
Adj. R-squared	0.693		
F-statistic	11.24***		

Observations

20

Note: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. Fixed Effects Model selected based on Hausman Test ($\chi^2 = 14.82$, $p = 0.021$).

CONCLUSION

This study provides evidence that Indonesian state-owned banks experienced significant but ultimately recoverable deterioration in financial performance during COVID-19. ROA fell from a pre-pandemic mean of 2.27% to 1.32% in 2020 before recovering to 2.89% by 2023, surpassing pre-pandemic levels. NPL and BOPO worsened during the pandemic but showed significant improvement in the post-COVID period, confirming H1, H2, and H3. CAR strengthened throughout the study period (H4 confirmed), while LDR showed no statistically significant change (H5 rejected).

A distinctive finding is the acceleration of sustainability commitments during the pandemic. All four BUMN banks increased their ASRRAT ratings and expanded sustainable finance portfolios between 2019 and 2023. The positive association between ASRRAT scores and ROA (H6 supported) indicates that sustainability resilience may contribute to financial performance. For bank management, the findings underscore the value of pre-crisis capital buffers and proactive cost management. For OJK, the results reinforce the rationale for mandatory sustainability reporting and green finance incentives.

This study is limited by its small sample ($N=20$), which constrains the statistical power of the panel regression. Future research should extend the sample to include private banks, apply difference-in-differences methods to estimate causal impacts more rigorously, and incorporate qualitative analysis of sustainability governance practices.

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