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Determinants of Sustainable Profitability in Indonesian Regional Development Banks During COVID-19

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ABSTRACT

Regional Development Banks (BPDs) in Indonesia face the dual responsibility of maintaining profitability while supporting regional economic development, a challenge that intensified during the COVID-19 pandemic. This study aims to examine the financial and governance determinants of sustainable profitability among Indonesian BPDs during the crisis period. Using panel data from 27 BPDs over 2019–2021, this study applies the Fixed Effects Model (FEM) to analyze the effects of capital adequacy ratio (CAR), non-performing loans (NPL), operational efficiency (BOPO), good corporate governance (GCG), and institutional share ownership (ISO) on return on assets (ROA). The results show that CAR has a positive and significant effect on ROA (b = 0.0823; p = 0.001), while NPL (b = -0.2156; p = 0.003) and BOPO (b = -0.0612; p = 0.003) have negative and significant effects. GCG (b = 0.0456; p = 0.019) and ISO (b = 0.0289; p = 0.035) also positively affect ROA. The model explains 72.34% of profitability variation. These findings imply that capital strength, credit risk control, operational efficiency, governance quality, and institutional oversight are essential for sustaining BPD profitability during systemic crises.

Keywords: Capital Adequacy; Corporate Governance; Credit Risk; Regional Development Banks; Sustainable Profitability

JEL Classification: G21; G28; G32; M41

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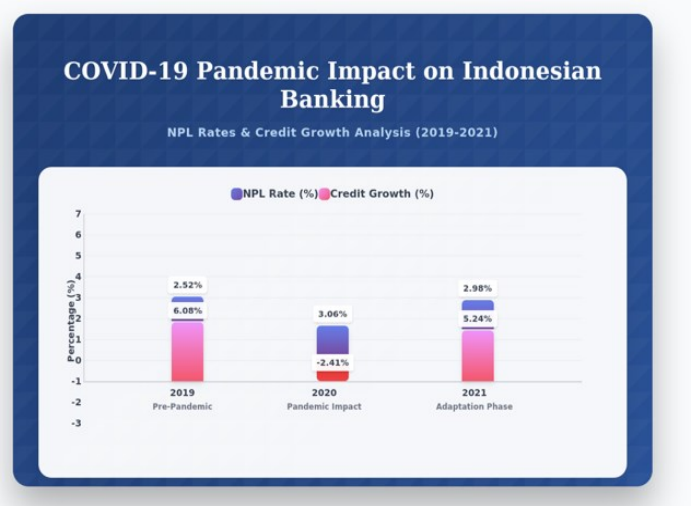
INTRODUCTION

Sustainable profitability has become a critical issue in the banking industry following the COVID-19 pandemic, which fundamentally disrupted traditional banking business models worldwide. For Indonesian Regional Development Banks (*Bank Pembangunan Daerah*/BPDs), sustaining profitability during the crisis involved a complex trade-off between maintaining financial soundness and fulfilling their developmental mandate to support regional economic growth. Unlike general commercial banks, BPDs have a distinct regional mandate because they are expected not only to operate as profit-oriented financial institutions but also to support local economic development, regional financial intermediation, and financing for productive sectors in their respective provinces. The Financial Services Authority (*Otoritas Jasa Keuangan*/OJK) has also emphasized the strategic role of BPDs as regional economic drivers and important contributors to national economic development through their intermediary function in the regions (OJK, 2024). Therefore, examining the determinants of sustainable profitability in BPDs is important because their financial resilience directly affects both banking stability and regional development capacity.

Prior studies have extensively examined the determinants of bank profitability, primarily within the context of commercial banks. Ruza et al. (2019) demonstrate that capital adequacy and operational efficiency, proxied by the capital adequacy ratio (CAR), non-performing loans (NPL), operating expenses to operating income (BOPO), and return on assets (ROA), play a crucial role in strengthening bank resilience during crisis periods. However, their analysis does not incorporate the institutional and operational characteristics unique to BPDs. From a governance perspective, Kismawadi (2025) highlights the importance of good corporate governance (GCG) within an agency theory framework, showing that effective governance mechanisms reduce agency costs and enhance institutional performance. Nevertheless, their study does not explicitly account for crisis conditions. Similarly, Othmani (2022) finds that institutional ownership improves bank performance through stronger monitoring incentives, but their evidence is drawn from multinational banks, limiting its applicability to regionally owned development banks.

Empirical evidence further underscores the severity of the pandemic's impact on Indonesia's banking system. According to OJK (2021), the COVID-19 crisis created substantial pressure on the financial services sector, prompting regulatory responses to maintain financial stability and support national economic recovery. The banking sector experienced weakened intermediation during the early pandemic period, as reflected in negative credit growth in 2020 before recovering in 2021. OJK reported that bank credit contracted by 2.4% year-on-year in 2020 and subsequently grew by 5.2% year-on-year in 2021, while the NPL ratio remained around 3.0% in 2021, indicating persistent credit risk pressure during the recovery period (Antara News, 2022; OJK, 2021). These conditions adversely affected borrower performance, increased credit risk, and required banks to strengthen loan loss provisions (*Cadangan Kerugian Penurunan Nilai*/CKPN), thereby placing downward pressure on profitability. Consistent with this, Saif-Alyousfi (2025) reports significant increases in BOPO and NPL ratios during the pandemic, signalling deteriorating efficiency and heightened credit risk, as illustrated in Figure 1.

Figure 1. The Impact of the COVID-19 Pandemic on Key Indicators of Indonesian Banking (2019–2021)



Source: OJK (2021)

Within the context of BPDs, these challenges became more pronounced due to their dual mandate. BPDs were expected to continue extending credit to micro, small, and medium-sized enterprises (MSMEs), local government-related projects, and regional development programs while simultaneously maintaining prudential banking principles. This condition differentiates BPDs from general commercial banks because their performance cannot be assessed solely from profitability objectives but must also be understood in relation to their regional development role and local government ownership structure. OJK's policy direction for BPDs further emphasizes the need for these banks to become resilient, contributive, and competitive regional financial institutions, reinforcing the importance of capital strength, risk management, governance quality, and institutional oversight in sustaining their performance (OJK, 2024). Le et al. (2022) document significant changes in the income structure and risk profile of regional banks during the COVID-19 period, highlighting the increasing importance of income diversification beyond traditional interest-based revenues.

Based on the above discussion, this study aims to examine the effects of capital adequacy, credit risk, operational efficiency, GCG, and institutional ownership on the sustainable profitability of Indonesian BPDs during the COVID-19 period. This study contributes to the banking literature by focusing specifically on BPDs, which differ from commercial banks due to their dual mandate as profit-oriented institutions and regional development agents. Unlike prior studies that mainly examine commercial banks or non-crisis periods, this research integrates financial and governance determinants within an agency–signalling framework during a systemic shock. The findings are expected to provide practical insights for BPD management, regulators, and local government shareholders in strengthening bank resilience and profitability sustainability during periods of economic uncertainty.

LITERATURE REVIEW

Theoretical Framework

This study conceptualises sustainable profitability as a bank's ability to maintain consistent profitability during crisis periods, proxied by ROA over time using panel data. To explain the determinants of sustainable profitability under economic uncertainty, this research integrates Agency Theory and Signalling Theory. These theories provide

complementary perspectives for understanding how internal financial conditions and governance mechanisms shape bank performance and stakeholder perceptions.
Agency Theory emphasises potential conflicts of interest between principals and agents. In the context of BPDs, principals may include local government shareholders and other institutional owners, while agents refer to bank management. During crisis periods, agency problems may intensify because managers face pressure to maintain profitability while managing rising credit risk and fulfilling regional development responsibilities. Effective governance mechanisms, such as GCG and institutional ownership, are therefore essential for mitigating opportunistic managerial behaviour and aligning managerial actions with long-term institutional objectives (Al-Homaidi et al., 2018; Boadi et al., 2016; Bremus & Ludolph, 2021; Jensen & Meckling, 2019; Kismawadi, 2025; Puspitasari et al., 2025).

Signalling Theory explains how banks convey credible information about their financial condition to stakeholders under conditions of information asymmetry. Financial indicators become particularly salient during crises, when future performance is highly uncertain (Garbarino & Guin, 2021; Ozili, 2018; Spence, 1978). From this perspective, strong capitalisation measured by the CAR serves as a positive signal of financial resilience (Berger et al., 2022; Yang et al., 2023). Conversely, elevated NPL and high BOPO represent negative signals reflecting deteriorating asset quality and operational inefficiency (Abaidoo & Agyapong, 2022; Hidayat et al., 2021; Khan et al., 2020; Nasim et al., 2025).

During systemic crises such as the COVID-19 pandemic, the sustainability of bank profitability is strongly influenced by both financial fundamentals and governance mechanisms. From a Signalling Theory perspective, strong financial indicators convey bank resilience to stakeholders, while Agency Theory emphasises the role of governance structures in mitigating managerial opportunism and enhancing performance sustainability. Therefore, the integration of both theories is relevant for explaining how financial strength, risk management, operational efficiency, governance quality, and institutional monitoring shape the sustainable profitability of BPDs.

Hypotheses Development

Capital Adequacy and Sustainable Profitability

Capital adequacy reflects a bank's ability to absorb losses and maintain financial stability under adverse conditions. Banks with stronger capital buffers are generally more capable of sustaining operations, maintaining public confidence, and absorbing unexpected losses during periods of economic uncertainty. Prior studies show that well-capitalised banks are more resilient during crises and tend to exhibit stronger and more sustainable profitability (Berger et al., 2022; Ruza et al., 2019). Adequate capital also serves as a positive signal of financial soundness, particularly for regionally owned banks facing heightened uncertainty. Therefore, this study proposes the following hypothesis:

H1: Capital adequacy (CAR) has a positive effect on the sustainable profitability of BPDs.

Credit Risk and Sustainable Profitability

Credit risk, proxied by NPL, represents a major constraint on profitability because problem loans reduce interest income and increase provisioning costs. During crisis periods, deteriorating borrower performance can increase default risk and weaken bank earnings. Empirical evidence consistently finds that higher NPL levels undermine bank profitability, especially during periods of economic stress (Le et al., 2022; Saif-Alyousfi, 2025). From a Signalling Theory perspective, a high NPL ratio sends a negative signal

regarding asset quality and credit risk management. Therefore, this study proposes the following hypothesis:

H2: Credit risk (NPL) has a negative effect on the sustainable profitability of BPDs.

Operational Inefficiency and Sustainable Profitability

Operational efficiency is a critical determinant of bank performance, particularly when revenue growth is constrained. BOPO reflects the extent to which operating expenses are incurred to generate operating income. A higher BOPO ratio indicates lower operational efficiency and may reflect weak cost control, ineffective resource allocation, or managerial inefficiency. Previous studies show that operational inefficiency negatively affects bank profitability because excessive operating costs reduce earnings capacity (Abaidoo & Agyapong, 2022; Hidayat et al., 2021). Therefore, this study proposes the following hypothesis:

H3: Operational inefficiency (BOPO) has a negative effect on the sustainable profitability of BPDs.

GCG and Sustainable Profitability

Strong corporate governance enhances transparency, reduces agency conflicts, and improves strategic decision-making (Lestari et al., 2024; Wirakusuma & Mertha, 2025; Wiratama & Prasetio, 2025). In the banking sector, effective governance is particularly important because banks manage public funds and operate under high regulatory scrutiny. During crisis periods, governance quality becomes more critical because management must balance profitability, risk control, and institutional accountability. Previous studies document that effective governance mechanisms positively influence bank performance and stability during periods of economic stress (Kismawadi, 2025; Puspitasari et al., 2025). Therefore, this study proposes the following hypothesis:

H4: GCG has a positive effect on the sustainable profitability of BPDs.

Institutional Ownership and Sustainable Profitability

Institutional ownership strengthens monitoring functions and aligns managerial actions with long-term performance objectives. In the context of BPDs, institutional ownership is particularly relevant because local government ownership may increase oversight, accountability, and strategic alignment with regional development objectives. From an Agency Theory perspective, institutional owners can reduce managerial opportunism through stronger monitoring and control mechanisms. Empirical evidence suggests that higher institutional ownership improves bank profitability and risk management, particularly in emerging markets (Jensen & Meckling, 2019; Othmani, 2022). Therefore, this study proposes the following hypothesis:

H5: Institutional ownership (ISO) has a positive effect on the sustainable profitability of BPDs.

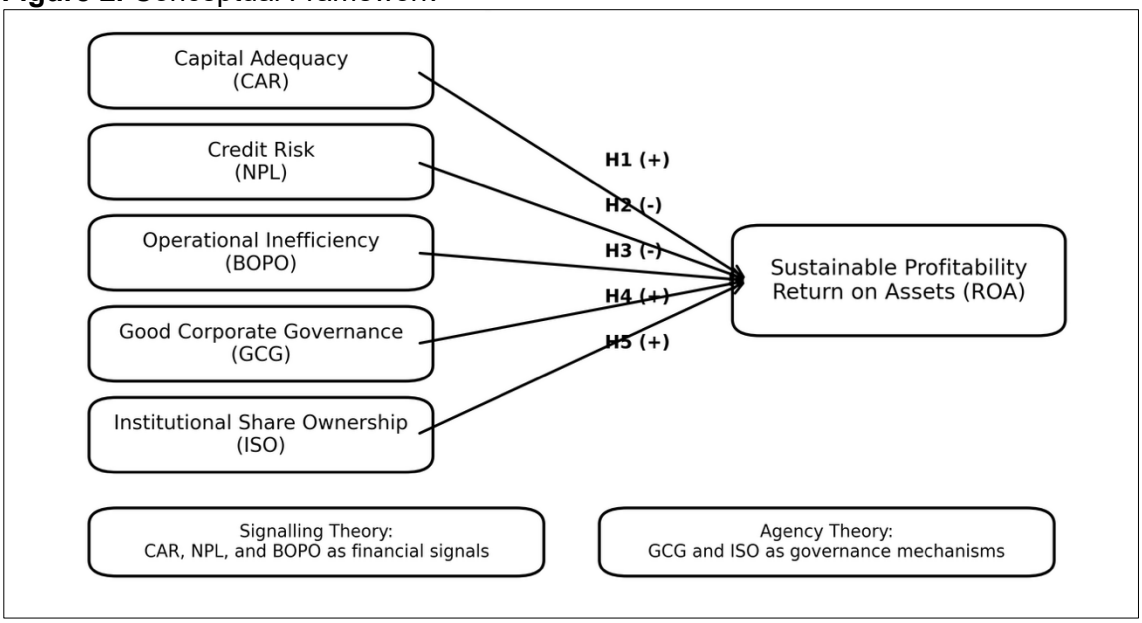
Conceptual Framework

Based on the theoretical framework integrating Agency Theory and Signalling Theory, as well as empirical findings from prior studies, this research formulates several testable hypotheses to examine the relationship between financial fundamentals, governance mechanisms, and sustainable profitability of BPDs in Indonesia during the COVID-19 period. Based on Signalling Theory, higher CAR serves as a positive signal of financial resilience and loss-absorbing capacity, which enhances stakeholder confidence and supports sustainable profitability during crisis periods. In contrast, higher NPL and BOPO

serve as negative signals because they indicate deteriorating credit quality and operational inefficiency.

From the Agency Theory perspective, GCG and institutional ownership function as monitoring mechanisms that help reduce agency conflicts and improve managerial accountability. Stronger governance quality and greater institutional ownership are expected to enhance decision-making, strengthen risk control, and support profitability sustainability. Therefore, this study positions CAR, NPL, BOPO, GCG, and ISO as determinants of sustainable profitability, measured by ROA. The conceptual framework, as shown in Figure 2, illustrates the direct relationships between financial indicators, governance mechanisms, and sustainable profitability, providing a logical foundation for hypothesis development and empirical testing.

Figure 2. Conceptual Framework



RESEARCH METHOD

Research Approach and Design

This study adopts a quantitative approach with a panel data regression design. Panel data are employed because they allow the analysis to combine cross-sectional and time-series dimensions simultaneously (Baltagi, 2021; Gujarati, 2021). This approach enables the study to control for unobserved bank-specific heterogeneity and provides more efficient parameter estimates. The study period spans from 2019 to 2021, which was selected to capture the pre-pandemic baseline condition in 2019 and the COVID-19 crisis period in 2020–2021.

Population, Sample, and Data Collection

The population of this study comprises all BPDs operating in Indonesia. A purposive sampling technique was employed based on the following criteria: first, BPDs were registered with and supervised by the OJK during the 2019–2021 period; and second, BPDs published complete and accessible annual financial statements and corporate governance reports throughout the observation period. Based on these criteria, the final sample consisted of 27 BPDs. With a three-year observation period, the study used 81 bank-year observations. The data were obtained from the annual reports of individual BPDs and statistical publications issued by OJK.

Variable Definition and Measurement

The dependent variable in this study is sustainable profitability, proxied by ROA. ROA is measured by dividing profit before tax by total assets and multiplying the result by 100%. The independent variables consist of capital adequacy, credit risk, operational efficiency, GCG, and institutional share ownership (ISO).

Capital adequacy is measured using the CAR, calculated as bank capital divided by risk-weighted assets. Credit risk is measured using the gross NPL ratio, calculated as total NPL divided by total loans. Operational efficiency is measured using BOPO, calculated as operating expenses divided by operating income. GCG is measured using the composite GCG score disclosed by each bank based on self-assessment in accordance with OJK regulations. Since lower GCG scores indicate better governance quality in the original rating system, the GCG score was reversed for analytical purposes so that higher values represent better governance quality. ISO is measured as the percentage of shares owned by government or institutional shareholders divided by total outstanding shares.

The measurement details are summarized in Table 1.

Table 1. Operational Definition of Variables

Variable	Role	Operational Definition	Measurement
Sustainable Profitability	Dependent (Y)	The bank's ability to generate profits from its total assets, reflecting the efficiency of asset management over time.	ROA = (Profit Before Tax / Total Assets) × 100%
Capital Adequacy Ratio (CAR)	Independent (X1)	A CAR that functions as a buffer against potential losses arising from banking risks.	CAR = (Bank Capital / Risk-Weighted Assets) × 100%
Non-Performing Loans (NPL)	Independent (X2)	A ratio indicating the proportion of problem loans, reflecting the level of credit risk faced by the bank.	Gross NPL = (Total NPL / Total Loans) × 100%
Operational Efficiency (BOPO)	Independent (X3)	A ratio measuring the level of operational efficiency in conducting banking activities.	BOPO = (Operating Expenses / Operating Income) × 100%
Good Corporate Governance (GCG)	Independent (X4)	The quality of the implementation of GCG principles within the bank.	Composite GCG score disclosed by the bank, based on self-assessment in accordance with OJK regulations. Scores range from 1 (excellent) to 5 (poor). For

			analytical purposes, the score is reversed so that higher values indicate better governance quality.
Institutional Share Ownership (ISO)	Independent (X5)	The percentage of shares owned by institutional investors, particularly local government ownership.	ISO = (Shares Owned by Government Institutions / Total Outstanding Shares) × 100%

Data Analysis Method

Data analysis was conducted using panel data regression. The regression model used in this study is formulated as follows:

$$ROAit = \alpha + \beta 1CARit + \beta 2NPLit + \beta 3BOPOit + \beta 4GCGit + \beta 5ISOit + \varepsilon it$$

where ROAit represents the ROA of bank i in year t; CARit represents capital adequacy; NPLit represents credit risk; BOPOit represents operational efficiency; GCGit represents GCG; ISOit represents ISO; α represents the constant; β1–β5 represent regression coefficients; and εit represents the error term.

To determine the most appropriate panel data estimation model, this study compared the Pooled Least Squares model, Fixed Effects Model (FEM), and Random Effects Model (REM). The Chow test was used to compare the Pooled Least Squares model and the FEM. The Chow test produced a Cross-section F statistic of 4.521 with a p-value of 0.0000. Since the p-value is below the 5% significance level, the null hypothesis stating that the Pooled Least Squares model is more appropriate is rejected. Based on this result, the FEM was selected at this stage.

The Hausman test was then used to compare the FEM and the REM. The Hausman test produced a chi-square statistic of 15.430 with a p-value of 0.0087. Since the p-value is below the 5% significance level, the null hypothesis stating that the REM is more appropriate is rejected. Therefore, the FEM was selected as the final estimation model. The use of the FEM is also theoretically appropriate because it controls for unobserved bank-specific characteristics, such as regional economic differences, ownership structure, organizational culture, and internal management strategies that may influence BPD profitability.

Because this study includes ISO in an FEM, the authors also assessed whether ISO had sufficient variation during the 2019–2021 period. The descriptive results indicate that ISO varied across banks and slightly across years, as reflected in the overall ISO range from 35.690 to 100.000 and the annual mean values of 92.456 in 2019, 91.745 in 2020, and 91.620 in 2021. Although institutional ownership among BPDs is generally high, this variation suggests that ISO still provides observable differences across the panel and can be included in the FEM estimation.

To ensure the reliability of the regression results, this study conducted several diagnostic tests. Multicollinearity was examined using the Variance Inflation Factor (VIF). The VIF results showed values ranging from 1.348 to 2.134, with a mean VIF of 1.668. Since all VIF values were below the threshold of 10, the model does not indicate serious multicollinearity. Heteroskedasticity was tested using the Breusch-Pagan test, which

produced a chi-square statistic of 8.763 with a p-value of 0.0119. Since the p-value is below the 5% significance level, heteroskedasticity was detected. Autocorrelation was examined using the Wooldridge test for serial correlation in panel data, which produced an F-statistic of 1.234 with a p-value of 0.2765. Since the p-value is above the 5% significance level, there is no evidence of significant first-order autocorrelation in the panel data. Since heteroskedasticity was detected, the final FEM estimation was reported using heteroskedasticity-robust standard errors. All statistical analyses were conducted using Stata version 17.

RESULTS

Table 2. Descriptive Statistics

Variable	N	Mean	Median	Minimum	Maximum	Std. Deviation
ROA	81	2.063	2.060	-3.800	3.730	1.173
CAR	81	23.371	23.380	9.010	41.680	4.645
NPL	81	1.543	1.070	0.020	4.510	1.333
BOPO	81	80.602	78.680	67.020	164.900	15.284
GCG	81	76.049	80.000	40.000	100.000	11.144
ISO	81	91.940	100.000	35.690	100.000	15.790

Note: ROA = Return on Assets; CAR = Capital Adequacy Ratio; NPL = Non-Performing Loans; BOPO = Operating Expenses to Operating Income; GCG = Good Corporate Governance; ISO = Institutional Share Ownership

Table 2 presents the descriptive statistics of the research variables, consisting of ROA, CAR, NPL, BOPO, GCG, and ISO, based on 81 bank-year observations from 27 BPDs during the 2019–2021 period. The average ROA is 2.063, with a minimum value of -3.800 and a maximum value of 3.730, indicating that most BPDs were able to maintain positive profitability during the observation period, although some banks experienced losses. The mean CAR is 23.371, which shows that, on average, BPDs maintained a relatively strong capital position. The CAR values range from 9.010 to 41.680, reflecting variation in capital adequacy across banks.

The average NPL is 1.543, with values ranging from 0.020 to 4.510, suggesting that credit risk among the sampled BPDs was generally manageable, although some banks faced higher levels of problem loans. BOPO records an average value of 80.602, with a minimum of 67.020 and a maximum of 164.900, indicating considerable variation in operational efficiency. The high maximum BOPO value suggests that some banks experienced significant operational inefficiency during the observation period. Meanwhile, the average GCG score is 76.049, indicating that the governance quality of BPDs was generally at a relatively good level. Institutional ownership has a high mean value of 91.940, with a median of 100.000, showing that most BPDs were dominantly owned by institutional shareholders, particularly local government institutions. Overall, the descriptive statistics indicate that BPDs generally maintained adequate profitability, strong capital, manageable credit risk, and high institutional ownership, although operational efficiency varied substantially across banks.

Table 3. Annual Mean of Research Variables

Year	ROA	CAR	NPL	BOPO	GCG	ISO
2019	2.169	21.817	1.539	79.785	74.815	92.456
2020	2.036	23.711	1.616	81.550	74.815	91.745
2021	1.983	24.585	1.474	80.470	78.519	91.620

Note: ROA = Return on Assets; CAR = Capital Adequacy Ratio; NPL = Non-Performing Loans; BOPO = Operating Expenses to Operating Income; GCG = Good Corporate Governance; ISO = Institutional Share Ownership

Table 3 presents the annual mean values of the research variables from 2019 to 2021, allowing the study to observe changes in BPD financial performance and governance indicators before and during the COVID-19 pandemic. The average ROA decreased gradually from 2.169 in 2019 to 2.036 in 2020 and 1.983 in 2021. This downward trend indicates that BPD profitability weakened during the pandemic period, although the average ROA remained positive. This suggests that BPDs were still able to generate profits despite facing economic pressure and rising uncertainty.

The average CAR increased from 21.817 in 2019 to 23.711 in 2020 and 24.585 in 2021, indicating that BPDs strengthened their capital position during the crisis period. Meanwhile, the average NPL slightly increased from 1.539 in 2019 to 1.616 in 2020, before declining to 1.474 in 2021. This pattern suggests that credit risk increased in the first year of the pandemic but became more manageable in the following year. BOPO increased from 79.785 in 2019 to 81.550 in 2020, reflecting higher operational pressure during the pandemic, before decreasing slightly to 80.470 in 2021. The average GCG score remained stable at 74.815 in 2019 and 2020, then improved to 78.519 in 2021, suggesting an improvement in governance quality. Institutional ownership remained consistently high, although it slightly declined from 92.456 in 2019 to 91.745 in 2020 and 91.620 in 2021. Overall, the annual mean values show that although BPD profitability and efficiency came under pressure during the pandemic, capital adequacy and governance quality improved, while credit risk remained relatively controlled.

Table 4. Panel Regression Results: FEM with Robust Standard Errors

Variable	Coefficient	Std. Error	t-Statistic	P-value
CAR	0.0823	0.0234	3.516	0.001***
NPL	-0.2156	0.0687	-3.139	0.003***
BOPO	-0.0612	0.0198	-3.091	0.003***
GCG	0.0456	0.0189	2.413	0.019**
ISO	0.0289	0.0134	2.157	0.035**
R-squared:	0.7234			
Adjusted R-squared:	0.6892			
F-statistic:	28.47 (p < 0.001)			

Remarks: *** significant at α = 1%, ** significant at α = 5%
Note: ROA = Return on Assets; CAR = Capital Adequacy Ratio; NPL = Non-Performing Loans; BOPO = Operating Expenses to Operating Income; GCG = Good Corporate Governance; ISO = Institutional Share Ownership

Table 4 presents the FEM regression results on the determinants of sustainable profitability, measured by ROA. The model has strong explanatory power, as shown by the R-squared value of 0.7234 and adjusted R-squared value of 0.6892, meaning that around 72.34% of the variation in ROA is explained by CAR, NPL, BOPO, GCG, and ISO. The F-statistic of 28.47 with a probability below 0.001 further indicates that these independent variables jointly have a significant effect on sustainable profitability. Therefore, the model is statistically appropriate for explaining the profitability performance of BPDs during the observation period.

The partial results show that all variables significantly affect sustainable profitability in the expected direction. CAR has a positive and significant effect on ROA, indicating that stronger capital adequacy improves banks' ability to sustain profitability; therefore, H1 is accepted. NPL has a negative and significant effect, showing that higher credit risk

reduces profitability because problem loans weaken income generation and increase provisioning pressure; therefore, H2 is accepted. BOPO also has a negative and significant effect, meaning that higher operational inefficiency decreases profitability by increasing the cost burden relative to income; therefore, H3 is accepted. Meanwhile, GCG has a positive and significant effect on ROA, indicating that better governance quality supports stronger profitability through improved oversight and decision-making; therefore, H4 is accepted. ISO also shows a positive and significant effect, suggesting that higher institutional ownership strengthens monitoring and supports profitability sustainability; therefore, H5 is accepted.

Overall, the findings confirm that sustainable profitability in BPDs is shaped by both financial fundamentals and governance mechanisms. Strong capital adequacy, lower credit risk, better operational efficiency, stronger governance quality, and higher institutional ownership jointly contribute to maintaining bank profitability. Since all variables are statistically significant and consistent with the hypothesized directions, H1, H2, H3, H4, and H5 are all accepted.

DISCUSSION

The Effect of CAR on Sustainable Profitability

The positive effect of CAR on sustainable profitability demonstrates that capital strength is a central determinant of BPD resilience during periods of systemic disruption. In line with Signalling Theory, a strong capital position communicates financial soundness to stakeholders and reduces uncertainty regarding a bank's capacity to absorb losses. During the COVID-19 pandemic, when credit quality, borrower capacity, and income stability were under pressure, capital adequacy enabled BPDs to maintain operational continuity and preserve stakeholder confidence. This result is consistent with Berger et al. (2022), Ruza et al. (2019), and Saif-Alyousfi (2025), who show that well-capitalised banks are generally more capable of sustaining profitability under adverse economic conditions.

In the BPD context, capital adequacy carries broader significance than in ordinary commercial banking. BPDs are not only expected to generate profits but also to support regional financial intermediation and local economic development. Adequate capital, therefore, allows them to continue financing productive sectors while maintaining prudential standards. This finding suggests that capital strength functions as both a protective buffer and a strategic capacity that enables BPDs to balance profitability objectives with their developmental mandate during crisis periods.

The Effect of Credit Risk on Sustainable Profitability

The negative effect of NPL on sustainable profitability confirms that credit risk is a major obstacle to BPD's financial performance. A higher NPL ratio weakens profitability by reducing interest income, increasing provisioning requirements, and limiting the bank's capacity to expand productive lending. From a Signalling Theory perspective, rising NPLs indicate deteriorating asset quality and may reduce stakeholder confidence in the bank's risk management capability. From an Agency Theory perspective, elevated credit risk may also reflect insufficient monitoring of lending decisions, particularly when credit distribution is influenced by regional development pressure or relationship-based lending practices.

This finding supports previous studies by Abaidoo & Agyapong (2022), Hidayat et al. (2021), Le et al. (2022), and Saif-Alyousfi (2025), which show that credit risk negatively affects bank profitability during periods of economic stress. For BPDs, this relationship

is particularly relevant because their loan portfolios are often concentrated in specific regional economies and local productive sectors. Such concentration may increase vulnerability when regional borrowers, especially MSMEs, experience financial distress. Therefore, sustainable profitability requires not only credit expansion but also prudent borrower assessment, effective loan monitoring, and timely restructuring policies.

The Effect of Operational Efficiency on Sustainable Profitability

The negative effect of BOPO indicates that operational inefficiency significantly undermines BPD profitability. A high BOPO ratio reflects the inability of operating income to adequately cover operating expenses, which directly reduces earnings capacity. During the pandemic, this issue became more critical as banks faced additional costs related to digital adaptation, credit restructuring, customer monitoring, and operational risk management. In this situation, BPDs with weaker cost control were more likely to experience pressure on profitability.

This result is consistent with Abaidoo & Agyapong (2022), Hidayat et al. (2021), Khan et al. (2020), and Nasim et al. (2025), who emphasize that operational efficiency is a key driver of bank performance. In comparison with larger commercial banks, some BPDs may face limitations in technology infrastructure, economies of scale, and service innovation. These structural limitations can make efficiency improvement more difficult but also more urgent. The finding, therefore, indicates that BPD sustainability depends not only on capital and credit quality but also on managerial capacity to control costs, improve internal processes, and adopt more efficient service delivery models.

The Role of GCG in Sustainable Profitability

The positive effect of GCG on sustainable profitability highlights the importance of governance quality in supporting BPD performance. This finding is consistent with Agency Theory, which argues that governance mechanisms reduce agency conflicts and strengthen managerial accountability. In banking institutions, governance quality is particularly important because managerial decisions affect not only shareholders but also depositors, borrowers, regulators, and the broader regional economy. During crisis periods, effective governance helps ensure that decisions related to credit restructuring, capital allocation, and risk control are made prudently and transparently.

This result aligns with Bremus & Ludolph (2021), Kismawadi (2025), and Puspitasari et al. (2025), who demonstrate the importance of governance in enhancing bank stability and performance. For BPDs, governance has a distinctive role because these banks operate at the intersection of commercial objectives and regional policy interests. Weak governance may expose BPDs to politically influenced lending, inefficient resource allocation, or excessive risk-taking. Conversely, strong GCG can help transform the developmental mandate of BPDs into disciplined financial intermediation. Thus, governance quality serves as an institutional safeguard that enables BPDs to pursue regional development objectives without compromising profitability and prudential banking principles.

The Effect of Institutional Ownership on Sustainable Profitability

The positive effect of institutional ownership indicates that ownership structure contributes to BPD profitability through stronger monitoring and strategic alignment. From the Agency Theory perspective, institutional shareholders can reduce managerial opportunism by exercising oversight over strategic decisions and performance outcomes. In the case of BPDs, institutional ownership is closely linked to local government ownership, which differentiates them from private commercial banks. This

ownership structure may provide institutional support, long-term commitment, and closer coordination with regional economic priorities.

This finding is consistent with Boadi et al. (2016) and Othmani (2022), who argue that institutional ownership can improve bank performance through more effective monitoring. However, the role of local government ownership in BPDs should be interpreted carefully. On the one hand, it can strengthen legitimacy, provide stable ownership commitment, and align bank strategy with regional development needs. On the other hand, without proper governance, it may create risks of intervention or non-commercial lending pressure. The positive result in this study suggests that institutional ownership supports sustainable profitability when it operates as an active monitoring mechanism and is accompanied by sound governance practices.

Overall Discussion

Taken together, the findings demonstrate that sustainable profitability in BPDs is shaped by both financial discipline and institutional control. CAR, NPL, and BOPO represent the financial capacity, risk exposure, and operational quality of banks, while GCG and ISO reflect the governance mechanisms that guide managerial behavior. The integration of Signalling Theory and Agency Theory is therefore appropriate, as financial indicators communicate bank resilience to stakeholders, whereas governance mechanisms help ensure that managerial decisions remain aligned with long-term institutional objectives.

The results also reinforce the importance of understanding BPDs as a distinct banking group. Their performance cannot be evaluated only through the lens of commercial profitability because they also carry regional development responsibilities and operate under strong local government ownership. During systemic shocks such as COVID-19, this dual role makes profitability sustainability dependent on the ability to combine strong capital, controlled credit risk, efficient operations, accountable governance, and effective institutional oversight. Thus, the study provides evidence that BPD resilience is not merely a matter of financial ratios, but also of institutional capacity to balance developmental responsibilities with prudent banking management.

CONCLUSION

This study examines the effects of capital adequacy, credit risk, operational efficiency, GCG, and institutional ownership on the sustainable profitability of BPDs in Indonesia during the COVID-19 period. Using panel data from 27 BPDs over the 2019–2021 period and applying the FEM, this study finds that financial fundamentals and governance mechanisms significantly influence sustainable profitability. Capital adequacy, GCG, and institutional ownership have positive effects on ROA, indicating that stronger capital buffers, better governance quality, and higher institutional ownership support profitability sustainability. In contrast, NPL and BOPO have negative effects on ROA, showing that higher credit risk and operational inefficiency weaken bank profitability.

The findings confirm that sustainable profitability in BPDs depends not only on financial strength but also on the quality of governance and monitoring mechanisms. From a theoretical perspective, the results support the relevance of Signalling Theory and Agency Theory in explaining BPD performance during crisis conditions. Financial indicators such as CAR, NPL, and BOPO reflect signals of resilience, risk, and efficiency, while GCG and institutional ownership function as governance mechanisms that help align managerial decisions with long-term institutional objectives. These findings are particularly relevant because BPDs operate under a dual mandate: maintaining financial performance while supporting regional economic development.

From a practical perspective, BPD management should strengthen capital adequacy, improve credit risk management, increase operational efficiency, and enhance governance practices to maintain profitability during periods of economic uncertainty. Regulators and local government shareholders should also reinforce active oversight and ensure that regional development objectives are balanced with prudential banking principles. This study is limited to Indonesian BPDs during the 2019–2021 COVID-19 period; therefore, future studies may extend the observation period, compare BPDs with other types of banks, or include additional variables such as digital transformation, liquidity, income diversification, and ESG-related factors.

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The authors declare that there are no potential conflicts of interest concerning the research, authorship, and/or publication of this article.

REFERENCES

Abaidoo, R., & Agyapong, E. K. (2022). Financial development and institutional quality among emerging economies. *Journal of Economics and Development*, *24*(3), 198-216. https://doi.org/10.1108/JED-08-2021-0135

Al-Homaidi, E. A., Tabash, M. I., Farhan, N. H., & Almaqtari, F. A. (2018). Bank-specific and macro-economic determinants of profitability of Indian commercial banks: A panel data approach. *Cogent Economics & Finance*, *6*(1), 1548072. https://doi.org/10.1080/23322039.2018.1548072

Antara News. (2022, January 20). *OJK: Kredit perbankan 2021 tumbuh 5,2 persen, NPL cenderung turun*. Antara News. https://www.antaranews.com/berita/2654429/ojk-kredit-perbankan-2021-tumbuh-52-persen-npl-cenderung-turun

Baltagi, B. H. (2021). The one-way error component regression model. In *Econometric Analysis of Panel Data* (pp. 15-45). Springer International Publishing. https://doi.org/10.1007/978-3-030-53953-5_2

Berger, A. N., Guedhami, O., Kim, H. H., & Li, X. (2022). Economic policy uncertainty and bank liquidity hoarding. *Journal of Financial Intermediation*, *49*, 100893. https://doi.org/10.1016/j.jfi.2020.100893

Boadi, E. K., Li, Y., & Lartey, V. C. (2016). Role of bank specific, macroeconomic and risk determinants of banks profitability: Empirical evidence from Ghana's rural banking industry. *International Journal of Economics and Financial Issues*, *6*(2), 813-823.

Bremus, F., & Ludolph, M. (2021). The nexus between loan portfolio size and volatility: Does bank capital regulation matter?. *Journal of Banking & Finance*, *127*, 106122. https://doi.org/10.1016/j.jbankfin.2021.106122

Financial Authority Services (Otoritas Jasa Keuangan/OJK). (2021). *Laporan Tahunan OJK 2021: Transformasi sektor jasa keuangan untuk mendukung pemulihan ekonomi nasional pasca pandemi*. Otoritas Jasa Keuangan (OJK). https://www.ojk.go.id/id/data-dan-statistik/laporan-tahunan/Pages/Laporan-Tahunan-OJK-2021.aspx

Financial Authority Services (Otoritas Jasa Keuangan/OJK). (2024). *OJK enhances Regional Development Banks' role in national growth*. Otoritas Jasa Keuangan

(OJK). https://ojk.go.id/en/berita-dan-kegiatan/siaran-pers/Pages/OJK-Enhances-Regional-Development-Banks-Role-in-National-Growth.aspx

Garbarino, N., & Guin, B. (2021). High water, no marks? Biased lending after extreme weather. *Journal of Financial Stability*, *54*, 100874. https://doi.org/10.1016/j.jfs.2021.100874

Gujarati, D. N. (2021). *Essentials of Econometrics*. Sage Publications.

Hidayat, S. E., Sakti, M. R. P., & Al-Balushi, R. A. A. (2021). Risk, efficiency and financial performance in the GCC banking industry: Islamic versus conventional banks. *Journal of Islamic Accounting and Business Research*, *12*(4), 564-592. https://doi.org/10.1108/JIABR-05-2020-0138

Jensen, M. C., & Meckling, W. H. (2019). Theory of the firm: Managerial behavior, agency costs and ownership structure. In *Corporate Governance* (pp. 77-132). Gower.

Khan, M. A., Siddique, A., & Sarwar, Z. (2020). Determinants of non-performing loans in the banking sector in developing state. *Asian Journal of Accounting Research*, *5*(1), 135-145. https://doi.org/10.1108/AJAR-10-2019-0080

Kismawadi, E. R. (2025). Improving Islamic bank performance through agency cost and dual board governance. *Journal of Islamic Accounting and Business Research*, *16*(3), 461-483. https://doi.org/10.1108/JIABR-01-2023-0035

Le, T. T., Nguyen, Q. A., Vu, T. M. N., Do, M. P., & Tran, M. D. (2022). Impact of income diversification on the default risk of Vietnamese commercial banks in the context of the COVID-19 pandemic. *Cogent Business & Management*, *9*(1), 2119679. https://doi.org/10.1080/23311975.2022.2119679

Lestari, K. A. N. S., Lestari, E. P., & Astuty, S. (2024). The influence of good corporate governance, corporate social responsibility, and financial literacy principles on the financial performance of village credit institutions in the Negara district of Jembarana. *International Journal of Applied Business and International Management, 9*(1), 1–13. https://doi.org/10.32535/ijabim.v9i1.2915

Nasim, A., Nasir, M. A., & Downing, G. (2025). Determinants of bank efficiency in developed (G7) and developing (E7) countries: Role of regulatory and economic environment. *Review of Quantitative Finance and Accounting*, *65*(1), 257-294. https://doi.org/10.1007/s11156-024-01272-6

Othmani, H. (2022). Foreign institutional ownership and bank performance: Evidence from Tunisia. *African Development Review*, *34*(1), 42-53. https://doi.org/10.1111/1467-8268.12625

Ozili, P. K. (2018). Banking stability determinants in Africa. *International Journal of Managerial Finance*, *14*(4), 462-483. https://doi.org/10.1108/IJMF-01-2018-0007

Puspitasari, D. M., Chin, J., & Dasman, S. (2025). Determinants and prediction model for rural bank sustainability in Indonesia Post-COVID-19. *Sustainability*, *17*(16), 7207. https://doi.org/10.3390/su17167207

Ruza, C., de la Cuesta-González, M., & Paredes-Gazquez, J. (2019). Banking system resilience: An empirical appraisal. *Journal of Economic Studies*, *46*(6), 1241-1257. https://doi.org/10.1108/JES-06-2018-0199

Saif-Alyousfi, A. Y. (2025). COVID-19 and non-performing loans of banks in Nigeria. *Journal of Chinese Economic and Foreign Trade Studies*, *18*(3), 366-397. https://doi.org/10.1108/JCEFTS-10-2024-0081

Spence, M. (1978). Job market signaling. In *Uncertainty in Economics* (pp. 281-306). Academic Press. https://doi.org/10.1016/B978-0-12-214850-7.50025-5

Wirakusuma, M. G., & Mertha, I. M. (2025). Tri Hita Karana-based governance and financial performance of Village Credit Institutions (LPDs): Moderating effects of location and IT. *International Journal of Accounting and Finance in Asia Pacific, 8*(3), 369–382. https://doi.org/10.32535/ijafap.v8i3.4208

Wiratama, R. H., & Prasetio, J. E. (2025). The role of good corporate governance and corporate social responsibility in shaping the financial performance of IDX-listed mining companies (2019–2023). *International Journal of Applied Business & International Management, 10*(2), 228–245. https://doi.org/10.32535/ijabim.v10i2.3854

Yang, H., Zhang, M., Xiang, Y., & Yang, Y. (2023). The balance of payments stages hypothesis: Improvements and new discoveries. *International Review of Economics & Finance*, *84*, 635-656. https://doi.org/10.1016/j.iref.2022.12.004

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