Volume 2 No. 2 (2025), pp: 78-87

Economics, Finance, and Business Review
https://journal.uii.ac.id/efbr

Credit risk, COVID, and bank profitability in Indonesian conventional banks

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ARTICLE INFO

JEL Classification Code:
G01, G20, G28

Keywords:
ROA, NPL, COVID-19

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DOI:
10.20885/efbr.vol2.iss2.art2

ABSTRACT

This study aims to analyze credit risk and other control variables on the profitability of conventional banks in Indonesia. Profit is measured by return on assets (ROA), and credit risk is measured by Non-Performing Loan (NPL). In addition, this study examines the moderation effect of the COVID pandemic through the interaction between NPLs and COVID on ROA. The study uses conventional bank panel data in Indonesia for the period 2015–2023 using quarterly data and a dynamic panel regression approach. The results of the study found that NPL negatively affected ROA. The assets, LDR, and CAR had a positive effect on ROA, while CIR, GDP, and COVID had a significant negative effect on ROA. Interestingly, the interaction between NPLs and COVID showed a positive influence, indicating that the pandemic encouraged increased risk management effectiveness and banking operational efficiency. The implications of the findings of the positive effects of the interaction between credit risk and the pandemic on bank profitability are the need to affirm the role of adaptive policies and credit restructuring in maintaining the performance of the banking sector in times of crisis.

Introduction

Profitability is the main indicator of a bank's financial performance and is an important measure for the sustainability and stability of the banking system. High profitability reflects the bank's ability to manage assets, reduce costs, and make efficient use of intermediation opportunities. Conversely, a decline in profitability can indicate weakening efficiency, increased risk, or pressure from macroeconomic conditions. Therefore, understanding the factors that affect the profitability of banks is a fundamental aspect of banking policy and management.

One of the important factors that affects banking profits is Non-performing loans (NPLs) (Jing, 2020). NPLs reflect the quality of a bank's assets and the extent to which the bank is able to manage credit risk, which is the largest source of risk in financial intermediation activities (Saif-Alyousfi, 2022). The increase in NPLs indicates a deterioration in the quality of the credit portfolio, which ultimately forces banks to increase their reserves of impairment losses. This reserve burden will reduce the bank's net profit and reduce the returns generated from credit disbursement.

The analysis of the influence of NPLs on profitability is becoming increasingly important in the Indonesian context because the intermediation structure of national banks is highly dependent on interest income from credit disbursement activities. When credit quality declines, interest income decreases, reserve costs increase, and bank profitability is directly affected. This is a crucial issue considering that Indonesian banks play a role as a motor of national economic growth through the intermediation function to the consumption, trade, and MSME sectors, which are empirically more vulnerable to fluctuations in credit risk (Risfandy & Pratiwi, 2022).

The Indonesian banking context provides interesting dynamics to be further researched. The national banking sector has a dominant role in the financial system and is the backbone of economic financing. Over the past two decades, Indonesian banks have shown relatively stable performance, but

still face challenges in terms of credit risk, liquidity pressures, and suboptimal operational efficiency. This condition became more complex when the COVID-19 pandemic crisis emerged, which caused significant pressure on asset quality, profitability, and financial stability (Sunarsih et al., 2022).

This study analyzes the impact of bad loans and several control variables, such as assets, CAR, LDR, CIR, and GDP, on banking profits in Indonesia. In addition, this study also analyzes the impact of COVID-19 on the performance of banks in Indonesia. The pandemic has the potential to change the relationship between a bank's fundamental variables and its profitability. For example, the increase in NPLs during the pandemic did not necessarily reduce profits due to credit restructuring policies and liquidity stimulus from financial authorities. This condition opens up an opportunity to test whether the interaction between credit risk (NPL) and COVID-19 has a different effect on profitability compared to normal periods (El-Chaarani, 2023). By including the interaction between NPLs and COVID, the study not only analyzed the internal and external factors that affect profitability, but also assessed how the pandemic moderated the relationship between credit risk and bank financial performance (Sunarsih et al., 2022).

The novelty of this research lies in several important aspects. First, this study uses a Dynamic approach to Profitability. This study uses a dynamic panel regression model to capture the effect of profitability lag, thus being able to explain profit persistence that is rarely analyzed in conventional Indonesian banking studies. Second, this study examines the interaction between Credit Risk and the COVID-19 Pandemic. This study examines how the pandemic affects the relationship between NPL and ROA through NPL and COVID interaction variables. These results provide new empirical insights into the effectiveness of credit restructuring and financial stabilization policies during times of crisis.

Thus, this research is expected to make a theoretical contribution to the development of literature on the determinants of banking profitability as well as practical contributions for regulators and bank management in strengthening profitability resilience in the face of future macroeconomic shocks.

Literature Review

Theory and Conceptual Framework

The bank's profitability performance can theoretically be explained through several main approaches, including Structure-Conduct-Performance (SCP), X-Efficiency Theory, and Risk-Return Trade-Off Theory. According to the Structure-Conduct-Performance (SCP) approach, a more concentrated market structure allows banks to gain greater market power, thereby setting higher interest margins and generating greater profitability(Fu et al., 2014). However, an alternative theory, the Efficient Structure Hypothesis (ESH), emphasizes that high profitability is not always due to market forces, but rather to the internal efficiency of banks, such as cost management, productivity, and good asset quality.

In addition, X-Efficiency Theory states that managerial efficiency is a major determinant of profitability. Banks that are able to manage operational costs effectively will obtain a higher profit ratio (Berger & DeYoung, 1997). In this context, the Cost to Income Ratio (CIR) reflects the level of efficiency of a bank: the lower the ratio, the more efficient the cost management will be and the higher the profitability. Meanwhile, the Risk–Return Trade-Off theory explains that a well-managed increase in risk can lead to higher returns. However, if risk—especially credit risk—is not managed properly, it will actually suppress profitability (Alandejani & Asutay, 2017). Thus, asset quality as measured by Non-Performing Loans (NPLs) is a key factor in determining the bank's profit level.

In addition to internal factors, macroeconomic conditions also play an important role in influencing banking performance. High economic growth (GDP) usually increases credit demand and customers' ability to pay, thus potentially increasing profitability. However, under conditions of intense competition or an increase in the cost of funds, economic growth is not always directly proportional to the increase in bank profits (Horobet et al., 2021).

The context of the COVID-19 pandemic has given a new dimension to the banking literature. The pandemic has not only disrupted economic activity but also worsened the quality of banking assets through an increase in non-performing loans. However, various stimulus policies such as credit restructuring, regulatory relaxation, and liquidity support from financial authorities can alter the relationship between credit risk and profitability during periods of crisis (El-Chaarani, 2023). Therefore,

testing the interaction between NPLs and COVID is important to understand how the banking system responds to shocks.

Previous Research

Research on the relationship between credit risk and child performance has been widely conducted in other countries. (Horobet et al., 2021) analyzed banking profits in Central and Eastern Europe in the period 2009-2018 using dynamic panels. The findings show that NPLs have a negative effect on ROA and ROE. (Saif-Alyousfi, 2022) analyzed the determination of banking profits in 47 Asian countries in the period 1995-2017 using a static panel. The results found that NPLs had a negative effect on ROA, ROE and NIM. Kalkan (2025) examined the impact of NPLs on banking profits in Turkey in the period 2023-2020 using static panels. The results show that NPL has a negative effect on ROA.

Research on the relationship between credit risk and bank performance has also been widely conducted in Indonesia on conventional banks. Amanda et al., (2020) examined the factors that affect the profits of conventional banking in Indonesia in the period 2012-2018 from 93 banks using static panel regression. The results indicate that NPLs have a negative effect on ROA and ROE. Priharta and Gani (2023) researched the profits of government-owned banks from 2011 to 2020 using static panel data regression. The results show that NPLs have a negative effect on ROA and ROE. Hayet et al., (2024) examined the profits of 6 conventional banks in Indonesia in the period 2014-2023 using static panel data. As a result, NPLs have a negative effect on ROA, but NPLs have no effect on bank margins.

Several studies have also examined the impact of credit risk on the performance of Islamic banks in Indonesia. Sunarsih et al. 2022) conducted research on 14 Islamic Banks in Indonesia from 2017 to 2020 using dynamic panel regression. The findings state that credit risk and liquidity risk have a negative relationship with the stability of Islamic banks. (Sutrisno & Widarjono, 2022) examined the benefits of Islamic banking in Indonesia in the period 2016-2020 with quarterly data and using dynamic panel data regression. The results show that the financing loss provision has a negative impact on ROA. Endrajati and Anggraeni (2025) examines the profits of all Islamic banks in Indonesia from 2020 to 2024 with a static panel. The results document that non-performing financing has a negative effect on ROA.

Methods

Research Design

This study uses an explanatory quantitative approach with the Dynamic Panel Regression method to analyze the factors that affect the profitability of conventional banks in Indonesia. This approach was chosen because the profitability variable (ROA) tends to be persistent and can be influenced by its past value. In addition, the dynamic model allows control of endogeneity problems that arise due to the two-way relationship between independent and dependent variables, especially in financial variables such as NPL, LDR, and CAR.

The dynamic panel model was estimated using the Generalized Method of Moments (GMM) method developed by (Arellano & Bond, 1991); (Arellano & Bover, 1995) This estimation uses internal instruments of differentiated variables, so that it can produce efficient and unbiased estimates of autocorrelation and heteroscedasticity problems.

Data Sources and Types

This study uses annual panel data of conventional banks in Indonesia registered with the Financial Services Authority (OJK) and Bank Indonesia (BI). The number of banks is 87. The data covers the period 2015–2023, covering conditions before, during, and after the COVID-19 pandemic. The main data sources come from the annual financial statements of conventional banks (Commercial Banks) published by the OJK, Indonesian Banking Statistics (SPI) from Bank Indonesia, and macroeconomic data (GDP and COVID indicators) from the Central Statistics Agency (BPS) and the COVID-19 Task Force.

Research Variables

The Dependent Variable is Return on Assets (ROA) (Ardana & Nurmalia, 2025). ROA is used to measure the level of profitability of a bank, calculated as the ratio of net profit to total assets. The higher the

ROA, the more efficient the use of bank assets in generating profits. ROA is a proxy of profitability because it reflects the efficiency of assets, so it is better to measure profitability than returns on equity (ROE) (Rita & Sugiarti, 2025).

Independent variables are composed of internal bank variables and macroeconomic variables. The bank's internal variables consist of NPLs, assets, LDR, CAR, CIR, GDP and COVID. Non-Performing Loan (NPL) describes a bank's credit risk, calculated from the total non-performing loans to the total loans disbursed. The increase in NPLs is expected to lower ROA. Assets are measured from the natural logarithm of total assets to represent bank *size*. Loan to Deposit Ratio (LDR) is the ratio of loans to third-party funds, reflecting the bank's intermediation and liquidity management functions. Capital Adequacy Ratio (CAR) is a capital adequacy ratio that shows a bank's ability to bear financial risks and expand financing. Cost-to-Income Ratio (CIR) is the ratio of operating costs to operating income, reflecting the operational efficiency of a bank.

Macroeconomic variables consist of GDP and COVID-19. Gross Domestic Product (GDP) describes macroeconomic conditions and aggregate economic activity. COVID-19 (Dummy Variable). Dummy variables valued at 1 for the period 2020–2021 and 0 for other periods, to capture the effect of the pandemic on bank profitability.

Analysis Method

This study examines the relationship between credit risk and conventional banking profits in Indonesia with a quantitative approach through the regression method. The regression method used is the dynamic data panel regression method. The use of the dynamic panel regression method is an effort to overcome the problem of endogeneity in regression equations, and profitability is persistent. We estimate the dynamic panel regression using the two-step General Method of Moments (GMM). This research model follows the model of previous studies (Santoso et al., 2023; Alnabulsi et al., 2023).The dynamic panel data regression model in this study can be written as follows:

$$ROA_{it} = \phi_0 + \phi_1 ROA_{it-1} + \phi_2 NPL_{it} + \phi_3 Lasset_{it} + \phi_4 LDR_{it} + \phi_5 CAR_{it} + \phi_6 CIR_{it} + \phi_7 LGDP_{it} + \phi_8 Covid_{it} + e_{it} \quad (1)$$

ROA is a return on assets that measures a bank's profits. NPL is a non-performing loan that measures bad loans. Assets are total assets that measure the size of a bank. LDR is a loan deposit ratio that measures the amount of a loan. CAR is the capital adequacy ratio that measures bank capital, CIR is the cost income ratio that measures cost efficiency, GDP is the gross domestic product that measures economic growth. COVID was a COVID pandemic in the second quarter of 2020

Indonesia's economy has slowed down since the second quarter of 2020 due to Covid-19. COVID-19 has a direct impact on banking in Indonesia, To find out whether the impact of NPLs on profits is affected during the COVID-19 pandemic, this study interacts between NPLs and Covid-19 where COVID-19 is a moderation variable (Sunarsih et al., 2022). The dynamic panel regression equation model is as follows:

$$ROA_{it} = \phi_0 + \phi_1 ROA_{it} + \phi_2 NPL_{it} + \phi_3 NPL_{it} * Covid + \phi_4 Lasset_{it} + \phi_5 LDR_{it} + \phi_6 CAR_{it} + \phi_7 CIR_{it} + \phi_8 LGDP_{it} + \phi_9 Covid_{it} + e_{it} \quad (2)$$

The interaction variable between NPL and COVID (NPL*COVID) shows the COVID variable as a moderation variable that affects NPLs to profits in the COVID-19 period. Table 1 presents the operational definitions of variables and hypotheses in this study.

Table 1. Variable Measurement and Hypotheses

Variable	Measurement	Hypothesis
ROA	Net income/ total assets (reference)	
NPL	Loan default/ total loans	-
Asset	Total asset	+
LDR	Loans/deposits	+
CAR	Equity/total assets	+
CIR	Cost/total income	-
GDP	Gross domestic product at constant price 2012	+
COVID-19	COVID-19, starting in the second quarter of 2020	-

Results and Discussion

Statistic Summary

Table 2 presents the summary statistics. The Return on Asset (ROA) has a mean of 1.374296% and a standard deviation of 2.056142%. Based on OJK regulations, with an average density rate of 1.37, conventional banking in Indonesia is categorized as healthy banking. Non-Performing Loans (NPLs) have a mean of 3.004569% and a standard deviation of 2.208712%. The value of this NPL is still lower than the maximum limit set by the OJK of 5%. Assets have a mean of 103 trillion and a standard deviation of 265 trillion. The maximum asset value is 1835 trillion and the minimum value is 0.67 trillion. This high standard deviation indicates that there is variation between banks. The average Loan Deposit ratio (LDR) is 89.86% with a standard deviation of 46.09%. The capital adequacy ratio (CAR) has an average of 35.51% and a standard deviation of 55.59%. The amount of this CAR exceeds the minimum limit of 12% set by the OJK. The cost-to-income ratio (CIR) has an average of 86.06% and a standard deviation of 25.73%.

Table 2. Summary statistics

Variable	Mean	Std. dev.	Min	Max
ROA	0.0137	0.0206	-0.1589	0.0838
NPL	0.0300	0.0221	0.0000	0.2227
ASSET	103.1049	265.2800	0.6647	1835.2490
LDR	0.8986	0.4609	0.0000	9.7165
CAR	0.3551	0.5559	0.0020	11.0797
CIR	0.8606	0.2573	0.0087	3.0648
GDP	2801.2400	170.2036	2498.6980	3139.1600
COVID	0.5000	0.5001	0.0000	1.0000

Table 3 shows the correlation between independent variables. In general, the results show a value of less than ± 0.5. The model's conclusion does not contain the problem of multicollinearity.

Table 3. Correlation matrix

	ROA	NPF	Lasset	LDR	CAR	CIR	LGDP
ROA	1						
NPL	-0.4059	1					
Lasset	0.2290	-0.0972	1				
LDR	0.0595	-0.0478	-0.0698	1			
CAR	-0.0611	-0.1212	-0.2250	0.1089	1		
CIR	-0.8850	0.4195	-0.2280	-0.0005	0.0588	1	
LGDP	-0.0309	-0.0880	0.1339	-0.0051	0.0942	-0.0320	1
COVID	-0.1018	0.0361	0.0579	-0.1223	0.0892	0.0351	0.1115

Baseline Regression Results

Table 4 shows the results of the dynamic model estimation. We fail to reject the null hypothesis of the Hansen test and fail to reject the null hypothesis of the AR test (2). In addition, the number of variables of the instrument is smaller than the number of banks. In conclusion, the GMM estimation method is valid for estimating the dynamic panel in equation (1).

The results of the dynamic panel regression estimation show that the lag of profitability has a positive and significant effect on ROA in the current period. This indicates profit $[ROA(-1)]$persistence in Indonesia's conventional banking sector. This means that banks that obtained a high level of profit in the previous period tend to be able to maintain their financial performance in the next period. These findings are consistent with the dynamic profit adjustment model, which posits that bank profitability is inertial, influenced by market structure, internal efficiency, and relatively stable managerial factors across periods. These results indicate that the dynamic panel regression is more applicable than the static panel regression.

NPLs have a negative effect on ROA, as expected from credit risk theory. An increase in NPLs indicates a deterioration in asset/credit quality, which increases the provision of losses and lowers net income from operations. These findings are in line with previous research both in conventional banking (Amanda et al., 2020; Priharta & Gani, 2023; Hayet et al., 2024) and Islamic banking (Sutrisno

& Widarjono, 2022; Sutrisno, 2023). In other words, an increase in the non-performing loan ratio directly depresses banks' profits through increased reserve costs and a decrease in net interest income. These findings confirm the importance of asset quality management to maintain profitability.

Table 4. Baseline regression

Variable	(1)	(2)	(3)
ROA(-1)	0.1966***	0.1964***	0.1942***
	(0.0082)	(0.0082)	(0.0078)
NPL	-0.0203***	-0.0213***	-0.0209***
	(0.0067)	(0.0063)	(0.0060)
Lasset	0.0003***	0.0003***	0.0006***
	(0.0001)	(0.0001)	(0.0001)
LDR	0.0027***	0.0028***	0.0026***
	(0.0004)	(0.0004)	(0.0004)
CAR	-0.0003***	-0.0001***	0.0002***
	(0.0001)	(0.0001)	(0.0001)
CIR	-0.0581***	-0.0578***	-0.0589***
	(0.0008)	(0.0008)	(0.0008)
LGDP	-	-0.0123***	-0.0141***
	-	(0.0015)	(0.0015)
COVID	-	-	-0.0014***
	-	-	(0.0001)
Cons	0.0544***	0.2349	0.2606
	(0.0026)	(0.0221)	(0.0216)
Observations	2088	2088	2088
No. banks	87	87	87
Instruments	53	54	55
Diagnostic test			
AR (1)	0.001	0.001	0.002
AR (2)	0.416	0.446	0.444
Hansen	0.099	0.125	0.107

***, ** and * are statistically significant at 1%, 5% and 10%.

Furthermore, the asset variable has a positive and significant effect on ROA. This result reflects that the larger the total assets owned by the bank, the greater the bank's ability to generate profits. Bank size is an indicator of economic capacity and economies of scale that allows large banks to reduce operational costs and take advantage of wider business opportunities. These findings are in line with research by Ashyari and Rokhim (2020) and Hendri et al. (2025) which shows that bank size is positively related to profitability.

The Loan to Deposit Ratio (LDR) variable also has a positive effect on ROA. These findings are in line with previous research (Sedera et al., 2022) . These findings indicate that the higher the bank's ability to channel third-party funds into financing or productive credit, the higher the level of profit obtained. This means that the bank's intermediation function runs effectively, where optimal credit distribution can increase net interest income. However, careful liquidity management is still needed so that an increase in LDR does not pose a liquidity risk in the future.

Meanwhile, the Capital Adequacy Ratio (CAR) variable has a positive effect on ROA. These findings are in line with previous research (Achsani & Kassim, 2021) This result indicates that strong capital adequacy increases the bank's ability to bear financial risks and expand business expansion. High capital also strengthens customer and investor confidence, thus contributing positively to profitability. This result supports the view of buffer capital theory which states that banks with strong capital tend to be more stable and able to achieve better levels of profitability.

On the other hand, the Cost to Income Ratio (CIR) variable has a negative and significant effect on ROA. This shows that the higher the cost-to-revenue ratio, the lower the bank's operational efficiency, which has an impact on declining profits. In other words, managerial efficiency is an important determinant in maintaining profitability. These results are consistent with the X-efficiency theory, where cost efficiency is one of the main pillars to maintain the bank's competitiveness and profitability. These findings are in line with previous research (Purwasih & Wibowo, 2021).

The Gross Domestic Product (GDP) variable actually has a negative effect on ROA. These findings show that national economic growth is not always followed by an increase in conventional banking profits. One possible explanation is that during periods of high economic growth, interbank competition in distributing credit is getting tighter, so interest margins decrease. In addition, the increase in the cost of funds and competitive pressures in the financial market can suppress profitability.

Finally, the COVID-19 variable showed a significant negative influence on ROA. These results confirm that the pandemic has had a negative impact on banks' financial performance through increased credit risk (non-performing loans), decreased credit demand, and weakening economic activity in general. This condition strengthens the evidence that macroeconomic shocks such as the pandemic have a contractionary effect on the profitability of conventional banks. This finding is in line with some previous empirical studies (Widarjono, 2025); (Putri & Misbah, 2025).

Further Analysis

For further analysis, this study investigates whether the effect of NPL on ROA is affected by COVID. Table 5 presents the interaction between NPL and COVID. (NPL*COVID). Interestingly, the estimated results show that the interaction between NPL and COVID has a positive effect on ROA. This finding means that although in general COVID lowered profitability and NPLs depressed bank performance, the combination of the two points in a positive direction towards ROA. The most logical interpretation is that during the pandemic period, the stimulus and credit restructuring policies issued by the government and financial authorities (e.g. OJK and Bank Indonesia) have mitigated the negative impact of the increase in NPLs on bank profitability. In other words, despite the increase in non-performing loans during the pandemic, credit relaxation policies, financing restructuring, as well as liquidity support and a reduction in benchmark interest rates have helped banks maintain their financial performance. Therefore, the effect of this positive interaction reflects the success of the policy buffer in reducing the pressure of the pandemic on the banking system (Sunarsih et al., 2022).

Table 4. Interaction effect

Variable	(4)	(5)
ROA(-1)	0.2008***	0.1968***
	(0.0079)	(0.0081)
NPL	-0.0333***	-0.0459***
	(0.0065)	(0.0059)
NPL*COVID	0.0356***	0.0437***
	(0.0072)	(0.0067)
Lasset	0.0003***	0.0006***
	(0.0001)	(0.0001)
LDR	0.0021***	0.0024***
	(0.0003)	(0.0004)
CAR	-0.0001***	0.0002***
	(0.0001)	(0.0001)
CIR	-0.0583***	-0.0587***
	(0.0009)	(0.0008)
LGDP	-	-0.0140***
	-	(0.0015)
COVID	-0.0024***	-0.0027***
	(0.0003)	(0.0002)
Cons	0.0556***	0.2599**
	(0.0025)	(0.0228)
Observations	2088	2088
No. banks	87	87
Instrument	55	56
Diagnostic test		
AR(1)	0.001	0.002
AR(2)	0.407	0.443
Hansen	0.074	0.093

***, ** and * are statistically significant at 1%, 5% and 10%.

Robustness Test

To see the consistency of the results, this study conducted a robustness test. The robustness test was carried out by estimating a static panel regression using pooled least squares with robust standard errors. The results are shown in Table 5. NPLs negatively affect profits, and the interaction between NPLs and COVID has a positive effect. These results are consistent with estimates using previous dynamic panel regression. In addition, the results for the control variables are consistent with the use of a dynamic panel.

Table 5. Robustness test

Variable	(6)	(7)
NPL	-0.0609***	-0.0662***
	(0.0198)	(0.0203)
NPL*COVID	0.0453**	0.0473**
	(0.0249)	(0.0253)
Lasset	0.0005***	0.0006***
	(0.0001)	(0.0001)
LDR	0.0023***	0.0023***
	(0.0009)	(0.0009)
CAR	-0.0002***	0.0000***
	(0.0003)	(0.0004)
CIR	-0.0687***	-0.0685***
	(0.0030)	(0.0029)
LGDP	-	-0.0210***
	-	(0.0034)
COVID	-0.0040***	-0.0039***
	(0.0009)	(0.0009)
Cons	0.0657***	0.3758*
	(0.0046)	(0.0500)
R-squared	0.7945	0.7975
Obs.	2088	2088
No. Banks	87	87

***, ** and * are statistically significant at 1%, 5% and 10%.

Conclusions

This study aims to analyze the factors that affect the profitability of conventional banks in Indonesia using the dynamic panel regression approach (GMM Arellano–Bond) during the period 2015–2023. The variables used include ROA as a dependent variable, while NPL, Assets, LDR, CAR, CIR, GDP, and COVID as independent variables. In addition, this study also examines the role of the interaction between NPLs and COVID on bank profitability. The results of this study confirm that the profitability of conventional banks in Indonesia is influenced by a combination of internal factors (credit risk, cost efficiency, capital, and bank size) as well as external factors (macroeconomic conditions and the COVID-19 pandemic). These findings enrich the empirical literature by showing that the role of pandemic moderation on the relationship between credit risk and profitability is positive, in contrast to the results of previous studies in other countries that generally show negative effects.

Thus, the novelty of this research lies in the empirical analysis of the interaction of credit risk (NPL) and external shocks (COVID) in the context of conventional banking in Indonesia using a dynamic model. The results provide new evidence that the pandemic can accelerate the adaptation of risk management and operational efficiency of banks. Based on the results of research and empirical interpretation, several policy recommendations can be submitted for Bank Management and OJK. First, it is necessary to strengthen credit risk management through a more data-driven credit scoring system to reduce the potential for NPLs. Second, banks need to improve operational efficiency (lower CIR) through digitalizing business processes, automating services, and optimising organisational structures to be more lean and adaptive. Third. Capital strengthening (CAR) and diversification of the credit portfolio remain key to maintaining profitability stability amid economic uncertainty. Fourth, the OJK and BI need to maintain adaptive macroprudential policies, such as the relaxation of credit restructuring during crisis periods, as they have been proven to help maintain the profitability and

stability of the financial system. Fifth, increased risk-based supervision is needed that is integrated with a digital reporting system to monitor the quality of banking assets in real time. Sixth, liquidity and capital policies need to continue to be adjusted to global economic dynamics so that the banking sector remains resilient in the face of external shocks.

There are several weaknesses in this study. First, it only analyzed 87 banks, so it doesn't reflect the behavior of all banks in Indonesia. The study also didn't include competition variables. Therefore, future research should consist of market competition variables and analyze all banks in Indonesia.

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