

# Determinants of Indonesian banking profitability: Before and during the COVID-19 pandemic analysis

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# DETERMINANTS OF INDONESIAN BANKING PROFITABILITY: BEFORE AND DURING THE COVID-19 PANDEMIC ANALYSIS

## Abstract

The purpose of this paper is to substantiate the determinants of Indonesian banking profitability before and during the COVID-19 pandemic. Return on assets (ROA), return on equity (ROE), and net interest margin (NIM) were used to measure banking profitability. The research population is 43 banks listed on the Indonesia Stock Exchange in 2020. Purposive sampling has been used to determine the research sample. The criteria are banks issued annual reports during the observation period (2019–2020). The data collection method used is documentation. Data analysis techniques used are descriptive analysis methods and multiple regression analysis. The results of the study indicate that banks experienced a decrease in profitability during the pandemic compared to before the pandemic. ROA before the pandemic was 0.82 and dropped to 0.62 during the pandemic; ROE from 1.76 to 1.32; and NIM became 4.79 from 4.91. Other results show that only Capital Adequacy Ratio CAR and Non-performing Loans (NPL) can determine bank profitability (ROA and ROE) significantly, both before and during the pandemic (the coefficient is –0.112 and –4.856 for CAR; –0.977 and –0.913 for NPL). CAR and NPL influence profitability negatively. Meanwhile, size and liquidity are not able to significantly influence profitability of Indonesian banking (ROA, ROE, and NIM). Bank management that can control NPL well will have a significant impact on profitability.

**Keywords** bank profitability, liquidity, size, bank health

**JEL Classification** G20, G32, M41

## INTRODUCTION

A well-running financial system is strong evidence of a country's economic growth. Efficiency in the intermediation role of financial institutions will ensure the smooth allocation of savings and the rate of return on savings and investment (Saif-Alyousfi & Saha, 2021). The COVID-19 pandemic has hit the world since the beginning of 2020. The financial industry in Indonesia has also been influenced. However, the impact is different compared to the 1998 crisis because Indonesia currently has better infrastructure (Cakranegara, 2020). The banking industry profile report issued by the Financial Services Authority or Otoritas Jasa Keuangan (OJK) shows that in December 2020, Conventional Commercial Bank or Bank Umum Konvensional (BUK) rentability was still maintained even though banks' ROA (return on assets) fell to 1.59% from 2.47% in the same period the previous year. NIM (net interest margin) decreased to 4.45% from 4.91% in line with net interest income which contracted by –2.21% (year on year) from 2.69% (year on year). Thus, the financial performance of Indonesian banks remains interesting for further study.

The financial performance of financial institutions (banks) has long been the focus of attention of researchers. Financial performance reflects the health and sustainability of a bank's business so that stakeholders are very concerned about it (Egbunike & Okerekeoti, 2018). Bank profitability is the subject of a large empirical study (Garcia & Trindade, 2019). Investigation of the evidence of factors affecting the profitability of banks became important after the 2008 crisis (Fidasoski et al., 2018). There are many measures that can be used to determine bank profitability. Return on assets (ROA) was used as a proxy of profitability (Bansal et al., 2018). Other researchers also use ROA to measure bank profitability (Garcia & Trindade, 2019). In addition, there are other measures such as the net interest margin ratio (Fidasoski et al., 2018) or net interest margin (Menicucci & Paolucci, 2016). Other empirical evidence states that profitability can be measured by ROE or return on equity (Saif-Alyousfi & Saha, 2021).

The factors that influence profitability of banks have also become an interesting study because there are still mixed results. Bank size is one of the predictors that will affect the level of profitability. The results of previous studies indicate inconsistencies. There is a positive influence of size on ROA (Bolarinwa & Soetan). Profitability was proven that was influenced by the size of a bank (Egbunike & Okerekeoti, 2018). Other findings show the opposite (Yadav et al., 2015), and not even significant (Bougatef, 2017). Other factors that affect the ability to earn profit are liquidity (Fidasoski et al., 2018), efficiency (Bolarinwa et al., 2019), capitalization (Öhman & Yazdanfar, 2018), and non-performing loans (Saif-Alyousfi & Saha, 2021).

## 1. LITERATURE REVIEW AND HYPOTHESES DEVELOPMENT

The literature review on banking performance research consists of two approaches such as accounting-based research and economics-based research (Olson & Zoubi, 2011). Studies that use the information contained in financial statements are called accounting-based studies. Researchers use profitability ratios such as return on assets (ROA), return on equity (ROE), or net interest margin (NIM) to measure financial performance. This approach is considered still limited to fully understand financial performance. Thus, a researcher uses a social science approach with statistical tools (parametric and non-parametric). This approach is known as the economic-based approach. This approach is considered more advanced (Talbi & Bougatef, 2018).

Factors that can determine profitability can be divided into internal and external factors (Al-Harbi, 2019). Internal factors are indicators that can be influenced by management decisions and bank policies. Meanwhile, external factors are beyond the control of bank management (Kassem & Sakr, 2018). Internal factors include financial-statement variables and non-financial-statement variables. External factors are variables that cannot be man-

aged by companies such as government regulations, inflation, ownership structure, competition, market share, and others.

The determinants of banking performance during the COVID-19 pandemic are interesting to study, including in the Indonesian context. The Financial Services Authority (OJK) report states that Indonesian banks are facing more challenges during the pandemic even though the policies and infrastructure are adequate. OJK has also issued a policy that will encourage Indonesian banks to show prospective performance during the pandemic. Factors that will influence bank profitability include bank size, liquidity, efficiency, and so on. This paper seeks to understand the predictors of bank profitability in Indonesia during the COVID-19 pandemic.

The relationship between size and profitability of a firm is a traditional question of business and industrial economics.

Theoretical and empirical studies give inconsistent results (Yadav et al., 2021). The findings of previous studies show a variety of results, including the size of a bank has a negative influence on return on assets (Saif-Alyousfi & Saha, 2021). Firm size determines ROA and ROE negatively and significantly (Yadav et al., 2021). The size of a firm has a positive and significant influence on ROA (Menicucci

& Paolucci, 2016). Size has also been proven to determine a bank's ROE positively and significantly (Ali & Puah, 2019). However, ROA is not shown to be significantly influenced by bank size (Bougatef, 2017). Other results show that there is no correlation between a firm's size and ROA (Öhman & Yazdanfar, 2018).

Company size is a significant determinant of the company's success in achieving significant profits, including in the non-bank industry. The size of a firm has a positive and significant impact on the profitability of the hospitality industry (Menicucci, 2018), the profitability of the manufacturing industry (Nanda & Panda, 2018, 2019), the profitability of pharmaceutical companies (Tyagi & Nauriyal, 2017), the profitability of real estate, industrial construction and infrastructure firms (Jolly Cyril & Singla, 2020), the profitability of insurance companies (Alhassan et al., 2015), and public private partnerships (Kumar et al., 2021). Firm size does not significantly affect the profitability of the manufacturing industry before the 2008 economic crisis (Nanda & Panda, 2018). Other results show that firm size does not significantly influence the profitability of insurance companies (Zainudin et al., 2018). Firm size has also been shown to positively and significantly influence ROE (Alarussi & Alhaderi, 2018).

Another factor that can influence profitability is liquidity, i.e., a bank's ability to meet cash needs quickly. Empirical studies have proven that liquidity has a positive and significant impact on ROA (Bougatef, 2017). However, there are results from previous studies that indicate that bank ROA is not significantly predicted by liquidity (Bolarinwa & Soetan, 2019). Liquidity does not significantly influence the profitability of insurance companies (Zainudin et al., 2018) and ROA of pharmaceutical companies (Lim & Rokhim, 2020). Liquidity is also not proven to be able to influence ROE (Alarussi & Alhaderi, 2018).

An important factor of bank profitability that has not been sufficiently discussed in empirical studies is cost efficiency. It has not enjoyed unanimous consensus among scholars. The results of the study prove that efficiency is a very strong factor affecting bank profitability (Bolarinwa et al., 2019). However, there are different findings that the effi-

ciency ratio has a negative and significant impact on ROA (Fidanoski et al., 2018). Managerial efficiency was found to not significantly influence bank ROA (Bougatef, 2017). The results of previous studies confirm the importance of further research to find the relationship between efficiency and profitability.

Bank profitability can also be influenced by the ratio of capital adequacy and non-performing loans. The study of the balance of capital structure and risk exposure should seriously consider the impact of the capital adequacy ratio (Fidanoski et al., 2018). Previous studies provide evidence that capital adequacy ratio positive and significantly affects ROA (Saif-Alyousfi & Saha, 2021). There is a positive and significant impact of CAR on ROA (Öhman & Yazdanfar, 2018). Bank capitalization has been shown to positively and significantly influence ROA (Bougatef, 2017). The results of other studies show that non-performance loans have a negative influence on ROA (Saif-Alyousfi & Saha, 2021).

CAR, liquidity, and Size have a positive and significant influence on ratio of net-interest margin or RNIM, while efficiency has a negative influence on RNIM (Fidanoski et al., 2018). Liquidity determines NIM positively and significantly (Talbi & Bougatef, 2018). Bank size and capitalization also significantly influence NIM (Menicucci & Paolucci, 2016). There was no significant influence of size, efficiency, and liquidity on NIM. Only bank capitalization has been proven to have a significant influence on NIM (Bougatef, 2017). NPL is the determinant of bank profitability. Banks that have high NPLs will experience problems in earning profits (Ozili, 2021).

The research objectives based on the description above are to analyze the determinants of Indonesian banking ROA before and during the COVID-19 pandemic; to analyze the determinants of Indonesian banking ROE before and during the COVID-19 pandemic; and to analyze the determinants of Indonesian banking NIM before and during the COVID-19 pandemic. The hypotheses developed in this study are as follows:

*H1: Indonesian banking ROA is significantly influenced by size, liquidity, capital, and non-performing loans.*

H2: Indonesian banking ROE is significantly influenced by size, liquidity, capital, and non-performing loans.

H3: Indonesian banking NIM is significantly influenced by size, liquidity, capital, and non-performing loans.

## 2. METHOD

This is a quantitative study with the causality test. The research population is banks listed on the Indonesia Stock Exchange (IDX) as of December 2020, as many as 43 banks. The sampling method is a purposive sampling with the criteria of banks issuing annual reports during the observation period (in 2019 and 2020). There are 43 banks resulting in 86 units of analysis.

The dependent variable is profitability as measured by ROA, ROE, and NIM. ROA is obtained from the ratio of profit before tax divided by total assets. ROE is obtained from the ratio of profit before tax divided by equity. NIM is obtained from the ratio of net interest income divided by the average financing receivables. The independent variables are bank size, liquidity, efficiency, capital, and non-performing loans. Bank size is calculated from total assets. Liquidity is calculated from the loan to deposit ratio or LDR, which is the ratio of loans divided by total third-party funds. Bank capitalization is calculated from the capital adequacy ratio or CAR, which is the ratio of bank capital to risk-weighted assets. Non-performing loans are calculated from the ratio of bad loans divided by total loans.

The data collection method used is documentation by looking at the financial statements (annual report) of each bank. The data analysis method used is descriptive analysis and multiple regression analysis (MRA). MRA was used to understand the determinants of Indonesian banking profitability before and during the COVID-19 pandemic.

**Table 1.** Indonesian banking profitability before and during the COVID-19 pandemic

Profitability indicator	Before pandemic	During pandemic	Notes
ROA	0.82	0.63	Decreasing
ROE	1.76	1.32	Decreasing
NIM	4.91	4.79	Decreasing

as well as the combined data of the two.

## 3. RESULT

### 3.1. Description of Indonesian banking profitability

Table 1 shows the profitability of Indonesian banking before and after the COVID-19 pandemic. Profitability as proxied by ROA, ROE, and NIM showed a significant decline during the pandemic. Indonesian banks face a significant challenge to make a profit during the COVID-19 pandemic. The general condition of the Indonesian economy has also experienced a very significant decline. Restricted economic activities to prevent a spike in cases exposed to COVID-19 have made Indonesian banks experience significant obstacles. Many efforts have been taken so that banks in Indonesia do not experience a significant decline in profits. Some banks can maintain their profitability performance. However, most banks experienced a decline in profits and even experienced significant losses.

### 3.2. Hypothesis testing results

The hypothesis testing results are presented in Table 2, Table 3, and Table 4. Table 2 indicates that only CAR and NPL significantly determined ROA both before and during the pandemic. The sig. value of CAR and NPL are less than 0.05 (a value of alpha). The overall cases are also the same, CAR influences ROA significantly although it has a negative impact. There is negative impact of NPL on ROA. Size and LDR have no significant influence on ROA both before and during the pandemic.

Table 3 also shows the same results. Only CAR and NPL have a significant influence on ROE, both before and during the pandemic. The sig. value of CAR and NPL are less than 0.05 (a value of alpha). The influence of both is negative. Meanwhile, size and LDR do not significantly influence ROE.

**Table 2.** Determinants of ROA before and during the pandemic

Independent variables	Coeff.	t-value	Sig.	Decision
<b>Before the pandemic analysis</b>				
Size of bank	6.690E	0.488	0.628	Rejected
Loan to deposit ratio	0.014	0.660	0.513	Rejected
Capital adequacy ratio	-0.112	-5.041	0.000	Accepted
Non-performing loan	-0.977	-3.056	0.004	Accepted
<b>During the pandemic analysis</b>				
Size of bank	-5.477E	-0.422	0.676	Rejected
Loan to deposit ratio	0.009	0.453	0.653	Rejected
Capital adequacy ratio	-0.110	-4.856	0.000	Accepted
Non-performing loan	-0.913	-3.056	0.007	Accepted
<b>Overall analysis</b>				
Size of bank	3.060	0.003	0.997	Rejected
Loan to deposit ratio	0.013	0.890	0.376	Rejected
Capital adequacy ratio	-0.111	-7.166	0.000	Accepted
Non-performing loan	-0.937	-4.262	0.000	Accepted

**Table 3.** Determinants of ROE before and during the pandemic

Independent variables	Coeff.	t-value	Sig.	Decision
<b>Before the pandemic analysis</b>				
Size of bank	3.112E	0.425	0.673	Rejected
Loan to deposit ratio	0.025	0.219	0.828	Rejected
Capital adequacy ratio	-0.649	-5.463	0.000	Accepted
Non-performing loan	-5.295	-3.104	0.004	Accepted
<b>During the pandemic analysis</b>				
Size of bank	-5.011E	-0.074	0.942	Rejected
Loan to deposit ratio	-0.003	-0.025	0.980	Rejected
Capital adequacy ratio	-0.641	-5.381	0.000	Accepted
Non-performing loan	-5.108	-3.047	0.004	Accepted
<b>Overall analysis</b>				
Size of bank	1.162E	0.241	0.810	Rejected
Loan to deposit ratio	0.014	0.184	0.854	Rejected
Capital adequacy ratio	-0.644	-7.894	0.000	Accepted
Non-performing loan	-5.177	-4.467	0.000	Accepted

**Table 4.** Determinants of NIM before and during the pandemic

Independent variables	Coeff.	t-value	Sig.	Decision
<b>Before the pandemic analysis</b>				
Size of bank	-8.693E	-0.038	0.970	Rejected
Loan to deposit ratio	0.031	0.870	0.390	Rejected
Capital adequacy ratio	0.015	0.396	0.694	Rejected
Non-performing loan	-0.839	-1.573	0.124	Rejected
<b>During the pandemic analysis</b>				
Size of bank	-5.385E	-0.256	0.799	Rejected
Loan to deposit ratio	0.026	0.799	0.429	Rejected
Capital adequacy ratio	0.015	0.400	0.691	Rejected
Non-performing loan	-0.783	-1.513	0.139	Rejected
<b>Overall analysis</b>				
Size of bank	-3.292E	-0.220	0.826	Rejected
Loan to deposit ratio	0.029	1.245	0.217	Rejected
Capital adequacy ratio	0.015	0.588	0.558	Rejected
Non-performing loan	-0.807	-2.244	0.028	Rejected

The surprising result was that no factors were found that could influence NIM, either before or during the pandemic. Size, LDR, CAR, and NPL have a significant value more than 0.05, which indicates no significant influence of size, LDR, CAR, and NPL on NIM. However, overall, a significant and negative impact of NPL on NIM was proven.

#### 4. DISCUSSION

The results showed that size and liquidity were not able to significantly influence ROA, ROE, and NIM. Only CAR and NPL have a significant influence on ROA and ROE before and during the COVID-19 pandemic. The influence of CAR is even negative on ROA and ROE. Using combined data before and during the pandemic also shows the same results.

<sup>8</sup> Bank size does not affect the profitability of Indonesian banks. The amount of assets owned cannot be used by banks to significantly increase ROA, ROE and NIM. Bank management experienced severe challenges during the pandemic so that they were unable to demonstrate adequate profitability performance. This finding is not in accordance with previous findings, which indicates a more positive influence of bank size on profitability (Bolarinwa & Soetan, 2019). However, the results obtained support the findings of previous studies that found that size was not significant to profitability (Öhman & Yazdanfar, 2018). Asset quality can also significantly determine the level of bank profitability (Zarrouk et al., 2016). Bank size is not a determinant of the profitability of commercial banks in Ethiopia (Lemi et al., 2020).

Based on the economics of scale theory, the larger the size of a company, the lower the costs, so that high profits will be generated (Alharbi, 2017). Banks with large assets should have the ability to deal with economic conditions during the pandemic. Banks will be more flexible in carrying out their operations because they have sufficient assets. Special policies in dealing with uncertain conditions during the pandemic can be issued by banks. A bank will remain excellent in providing services to customers with the creativity of the products offered during the COVID-19 pandemic.

Bank liquidity has also not been shown to have a significant influence on bank profitability before

and during the COVID-19 pandemic. Liquidity has a negative direction on the ROA level of a bank. These results support the bankruptcy cost hypothesis, which states that the level of risk caused by high liquidity will lead the bank to bankruptcy. Thus, will reduce the level of bank profitability (Sahyouni & Wang, 2018). Banks that are not able to manage liquidity properly will expose the bank to bankruptcy (Adelopo et al., 2018).

This finding is relevant with the results proven by previous researchers (Bolarinwa & Soetan, 2019). There is a significant relationship between liquidity and bank profitability (ROA) before, during, and after the financial crisis (Adelopo et al., 2018). The ability of banks to maintain liquidity in fact has no influence on bank profitability (Zainudin et al., 2018). The availability of liquidity should make it safer for banks to innovate in achieving profits. The results of this study differ from many previous findings that indicate a positive influence of liquidity on profitability (Saif-Alyousfi & Saha, 2021).

The capital adequacy ratio has a negative and significant influence on profitability (ROA and ROE) both before and during the COVID-19 pandemic. This finding is interesting to study more deeply because the influence is negative. CAR should have a positive impact on profitability. Adequate bank capital will enable banks to penetrate even in a pandemic. Bank management strives to innovate with the capital they must be able to provide quality services to customers, both in the form of financing and savings. Bank management is trying to convince customers that the bank can show good performance during the pandemic.

The effect of CAR on profitability is still uncertain. Several studies have found a negative effect. Higher capital means a bank will provide less credit to customers. Thus, the possibility of the bank to make a profit will be smaller (Yüksel et al., 2018). Other studies found different results. CAR is a positive significant determinant (Talbi & Bougatef, 2018). Capital adequacy was not found to have a significant effect on ROA and ROE of Indian commercial banks (Al-Homaidi et al., 2018).

<sup>23</sup> NPL is proven to have a negative and significant influence on profitability (ROA and ROE) before and during the pandemic. These results are in line with



the theory and previous research (Saif-Alyousfi & Saha, 2021). NPL is proven to have a significant effect on ROE but does not significantly affect ROA (Hasan et al., 2020). NPL strongly determines the level of ROA and ROE but is quite weak in influencing NIM (Horobet et al., 2021). The smaller the NPL, the higher the bank's profitability. NPL shows the performance of banks in controlling bad loans from customers. A small NPL provides evidence that banks can pressure customers to fulfill their obligations (pay off their debts to the bank). NPL is an indicator of bank health. The smaller the NPL, the healthier the bank.

The measurement of bank profitability becomes interesting in macroeconomic studies. Previous researchers have tried to find a relationship between macroeconomic indicators and the ability of banks to manage their resources to earn profits. Macroeconomic factors can affect ROE significantly (Ndlovu & Alagidede, 2018). Economic indicators that are proven to determine profitability are inflation and GDP (Zarrouk et al., 2016). Another inter-

esting study is the ability of banks to maintain business stability during the pandemic. Therefore, future researchers can develop the results of this study by linking them with other variables. Important findings will be obtained to better understand the overall financial performance of the bank. Signal theory is also important to be used in understanding investor behavior towards a company's financial performance indicators.

The credit growth variable is also important to determine the level of bank profitability (Kohlscheen et al., 2018). During a pandemic, banks will try to increase the level of credit disbursed to make a profit. Banks will be faced with very severe conditions, the possibility of the risk of uncollectible loans distributed. Market power, competition and capital market also determinant of bank profitability (Le & Ngo, 2020). There is a significant effect of board size and duality on bank profitability (Hakimi et al., 2018). Government bonds are interesting to study their impact on banking performance during the pandemic (Teixeira et al., 2021).

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**CONCLUSION**

This study aims to analyze the profitability of Indonesian banks (proxied by ROA, ROE, NIM) before and during the COVID-19 pandemic. The paper also investigates the determinants of Indonesian banking profitability. The results show that the profitability of Indonesian banking has decreased during the COVID-19 pandemic. The hypothesis testing results indicate CAR and NPL can determine ROA of Indonesian banking before and during the pandemic. There is a negative and significant effect of CAR and NPL on ROA. Size and LDR are not proven to be determinants of ROA before and during the pandemic. CAR and NPL are also proven as significant determinants of ROE, although size and LDR are not significantly proven. There was no significant effect of size, LDR, CAR, and NPL on the NIM of Indonesian banking. Thus, the determinants of profitability (ROA and ROE) of Indonesian banking before and during the pandemic are CAR and NPL. A large number of CAR and NPLs will cause a decrease in the level of ROA and ROE. So, CAR and NPL should be properly controlled by management.

The extremely unfavorable economic situation in Indonesia during the pandemic made the banking industry innovate so that it would not experience a more severe contraction. Owned resources must be used as well as possible to continue to show profitable performance. The ability of banks to control NPLs should be maintained and continuously improved. Larger NPLs will make a bank experience more severe problem. The Indonesian government through the Financial Services Authority (OJK) and Bank Indonesia can issue policies that will encourage banks to operate better.

This study has limitations in the units of data analyzed. Future research can add more data by conducting a comprehensive analysis. Indonesian banking semester, quarterly, or monthly data can be used both before and during the pandemic. Thus, more precise research results will be obtained. Future research can also add other variables to conduct a deeper analysis.

## AUTHOR CONTRIBUTIONS

Conceptualization: Abdul Rohman, Ahmad Nurkhin.

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Formal analysis: Abdul Rohman, Ahmad Nurkhin, Christian Wiradendi Wolor.

Funding acquisition: Abdul Rohman, Kusumantoro.

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Methodology: Abdul Rohman, Hasan Mukhibad, Ahmad Nurkhin.

Project administration: Ahmad Nurkhin, Kusumantoro.

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Writing – original draft: Abdul Rohman, Ahmad Nurkhin.

Writing – reviewing & editing: Abdul Rohman, Ahmad Nurkhin, Hasan Mukhibad, Christian Wiradendi Wolor.

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