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Research Article

The Influence of Bank Size, Operating Expenses and Operating Revenue (OER), Credit Risk, Inflation, and Gross Domestic Product (GDP) on the Performance of Commercial Banks in Indonesia

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ABSTRACT

Introduction: Commercial bank performance is one of the main indicators of a country's economic stability. Bank performance is influenced by various internal and external factors, including bank size, operational efficiency as measured by the Operating Expenses to Operating Revenue (OER) ratio, credit risk, and macroeconomic conditions such as inflation and Gross Domestic Product (GDP).

Objectives: This study aims to identify and analyze the influence of these variables on the performance of commercial banks in Indonesia, considering their important role in the national financial system.

Methods: This research uses the quantitative method and will use the secondary data obtained from quarterly report statements and financial statements published by each bank on their website. The data will be analyzed using E-Views 10.0.

Results: The results of panel data regression show that all independent variables (bank size, inflation, gross domestic product, operating expenses and operating income, and credit risk) have a significant effect on the dependent variable (performance). All independent variables have an influence of 97.70% on the dependent variable, Performance in commercial banks in Indonesia. Then, the remaining 2.30% is influenced by other variables not included in this study. Furthermore, the relationship between Credit Risk, Gross Domestic Product (GDP), and Operating Expenses and Operating Income (BOPO) on Performance has a positive and significant effect. However, the variables Bank Size and Inflation have a significant and negative effect on Performance.

Conclusions: Based on the research that has been conducted on performance in commercial banks in Indonesia, it can be concluded that the results of this study answer the research objectives. Furthermore, the study also answers the research questions and hypothesis about the relationship between Bank Size, Operating Expenses and Operating Revenue (OER), Credit Risk, Inflation, Gross Domestic Product (GDP), relationship with Performance.

Keywords: Bank Size, Operating Revenue (OER), Credit Risk, Inflation, Gross Domestic Product (GDP), Performance

INTRODUCTION

As a country with development goals and strategies, Indonesia implements various policies to achieve mature economic growth and equitable development that is not only focused on one region, but spread throughout the archipelago. The growth and development of this national development strategy is supported by various institutions formed by the government, which work in a coordinated manner to achieve the planned goals. Various institutions play an important role in this coordination, especially in the economic sector, which is one of the main indicators of a country's progress. Various economic strategies contribute to supporting economic activities, one of which is

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through the role of State-Owned Enterprises (BUMN) managed by the government in national economic activities. The banking sector, which is one of the main pillars driving the national economy, is also included in BUMN. It is undeniable that the development and growth of the national economy is greatly influenced by the large contribution of the banking sector, which provides support for the Indonesian people through various financing schemes, such as small and medium business loans, business loans, and banking services as a place to store community funds [1].

People in both developed and developing countries need the existence of banks as a means to carry out various financial activities. The habit of saving and managing assets through banks is a common practice among people. In developed countries, banks play a role as strategic institutions that drive national economic growth. Meanwhile, in developing countries, the community's need for banking services is generally limited to the function of storing and distributing funds, as well as the various financial services offered. Banks are financial institutions that provide a safe place for individuals to store their assets. In addition, banks also play a role in distributing credit to people who need financing for various purposes. Every individual can apply for a loan, as long as they meet the terms and conditions set by the bank. With its dual role, banks function as collectors of funds from people who have excess funds (surplus units) and distribute them to those in need (deficit units) [2].

The main objective of commercial banking is to achieve profitability. To achieve this objective, strategy and planning are needed in all commercial banking operations. However, this does not mean that commercial banking is only profit-oriented, because banks also have social and other objectives [3]. Financial reports are the main benchmark in assessing a bank's financial performance. In financial reports, banks are required to present information related to financial conditions, changes in capital, profit and loss, cash flow, and various other financial data that reflect management's ability to manage the institution. Through this report, the level of performance of a bank can be measured using various available financial ratios [4]. Significant changes have occurred in the banking sector throughout the world during the past few decades. These developments have had a significant impact on banking operations practices and the competitive climate in the banking sector. Several bank-specific, industry-specific, financial, and macroeconomic factors have substantially impacted banking structure and performance. Despite being widely criticized due to the current financial crisis, the banking sector's role in providing credit to individuals and businesses remains critical. The profitable and robust banking industry is better equipped to protect against adverse shocks, increases the chance of successful modernizations, and contributes to the financial system's stability and strength. Furthermore, a well-functioning and stable banking sector is necessary to improve economic contact across market sectors and achieve both allocation and operational efficiency, promoting economic growth. Unprofitable and risky banking, on the other hand, causes financial instability and has a negative impact on the economic growth process [5].

Commercial banks play an essential role in the growth of a country's economy and financial system. Commercial banks often accept deposits from individuals and lend the funds to those in need of funds for commercial or legal purposes. Commercial banks have expanded their product and service offerings in recent years, including internet banking, safe deposit boxes, credit cards, and more. As a result, the functioning of commercial banks is essential for a country's financial system. Commercial banks must ensure that they can increase customer service quality, preserve financial stability, and improve their performance, resulting in an efficient financial system [6].

On the other hand, the prolonged monetary crisis over the past few years has turned into an economic crisis, namely the decline in economic activity due to the increasing number of companies that have closed down, liquidated banks, and an increase in the number of unemployed workers, reminding the economic impact of a failure in the event of a banking business failure. The role of banking in Indonesia is essential; however, many banks have gone bankrupt. From 2003 to 2020, 103 banks were liquidated (Anggraeni, 2020). Even in 2020, the deposit insurance agency revealed that at least eight banks were threatened with bankruptcy due to the coronavirus outbreak. For this reason, it is necessary to carry out a series of analyses in such a way that the possibility of financial difficulties and even failure of banking operations can be detected as early as possible. The low quality of banking is reflected in, among others, weak internal conditions in the banking sector, weak bank management, morale of Human Resources (HR), and ineffective supervision by Bank Indonesia (BI). Many banks create increasingly fierce competition and lower bank performance due to the inability to compete in the market, so many banks are unhealthy or even financially unsound.

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Whether a company or a bank is healthy or not can be seen from its financial performance, especially its profitability performance in a banking company (Rositasari, 2020).

OBJECTIVES

The general objective of this study is to determine the impact of bank size, operating expenses, and operating revenue (OER), credit risk, inflation, and gross domestic product (GDP) on the performance of commercial banks in Indonesia. However, the specific objectives in this study can be explained as follows:

1. To assess for 2015-2020, the performance from bank size on commercial banks of Indonesia is affected.
2. To analyse the impact of operating expenses and operating revenue (OER) on performance in commercial banks in Indonesia for 2015-2020.
3. Throughout 2015-2020, an analysis of the impact of credit risk on performance in commercial banks in Indonesia.
4. To research the impact in 2015 to 2020 of inflation on the performance of Commercial Banks in Indonesia.
5. Analyzing the effects 2015 2020 of gross domestic product (GDP) on the performance of commercial banks in Indonesia.

METHODS

This research uses the quantitative method and will use the secondary data obtained from quarterly report statements and financial statements published by each bank on their website. Quantitative research that relies on the study of numerical data (numbers) that are ordered and analysed using mathematical techniques is used in this case. The purpose of quantitative analysis is to evaluate a hypothesis or provide evidence or mathematical explanation, to demonstrate relations between variables, and to establish definitions, to develop comprehension, or to explain several things [7]. The data used for this analysis consisted of secondary data from several reference sources, including the Financial Services Authority (OJK), the Bank Indonesia (BI), and each bank's reported financial statements. The population of this study contains both Islamic and Conventional Commercial Banks registered with Bank Indonesia and the Financial Services Authority. This study uses a purposeful sampling methodology. Banks with quarterly reports and quarterly financial reports from 2015 to 2020 and banks with complete details required by this survey are subject to sampling requirements. The Bank of Indonesia and the Financial Services Authority sampled in this study are 18 Commercial Banks registered with the Bank of Indonesia and the Financial Services Authority. The period of data in this study is for five years, from 2015 to 2020. The reason for conducting research in the 2015-2020 range is that 2020 is the last year that three Islamic commercial banks, namely BNI Syariah, BRI Syariah, and Bank Mandiri Syariah, will operate before merging into Bank Syariah Indonesia (BSI). Thus, the unit of analysis in this research is 432. This research uses the paradigm of epistemology, where the constructive approach stresses that actual events can be empirically observed and logically interpreted. The analysis is focused on theories and the truth that has been proven in past research. This paradigm suggests that the quantitative approach tests a particular fact. The regression of the data panel is a regression that uses a data panel or database that consists of a mixture of data from time series and cross-sectional data. The statistics for the analysis provide balanced panel data, as the same number of time-series observations occur in each unit cross-section. (Suliyanto, 2011). This panel regression test is used to determine the effect of the independent variable consisting of Bank Size, Operating Expenses and Operating Revenue (OER), Credit Risk, Inflation, and Gross Domestic Product (GDP) on Performance. To assist the study of this data and utilize E-views 10.0 and Microsoft Excel.

RESULTS

The Chow test, the Hausman test, and the Lagrange multiplier test are used in panel data regression analysis to determine which regression model is the best one to employ. Based on the output results above, it can be seen that the probability value (Prob.) for cross-section F is 0.0000, lower than the significance level of 0.05. Therefore, based on these results, it can be concluded that the fixed effect model is more appropriate to be used in this study.

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Table 1. Model 1

Model 1	Common effect	Coefficient	Fixed Effect	Coefficient	Random Effect	Coefficient
Bank Size	0.0000	-0.131626	0.0000	-0.390378	0.0030	-0.152440
Inflation	0.2572	-0.086190	0.0268	-0.074124	0.0816	-0.096739
GDP	0.2155	0.295925	0.0000	0.684355	0.0827	0.308703
OER	0.0000	0.110669	0.0000	0.090602	0.0104	0.258306
Credit Risk	0.0000	1.584.035	0.0001	1.838.055	0.0000	0.132556
C	0.6611		0.8100	-0.538214	0.9544	1.991.831
Observation	432		432		432	
R-squared	0.680450		0.892380		0.4832	
Number of firms	18		18		18	

Source: E-views Output

Table 2. Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	50.116592	(17,409)	0.0000

Source: E-views Output

Based on the output results above, it can be seen that the probability value (Prob.) for cross-section F is 0.0000, lower than the significance level of 0.05. Therefore, based on these results, it can be concluded that the fixed effect model is more appropriate to be used in this study.

Table 3. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	80.101318	5	0.0000

Source: E-views Output

Based on the results of the Hausman test output above, it can be seen that the probability value (Prob.) for cross-section F is 0.0000, lower than the significance level of 0.05. So it can be concluded that the fixed effect model is more appropriate to use in this study than the random effect model.

The coefficient of determination (Adjusted R Square) is used to measure how much the model can explain the variation of the dependent variable. The value of Adjusted R Square that is close to the value of one means that the ability of the independent variables is getting bigger to explain their effect on the dependent variable.

Table 5. Coefficient of Determination Test Results

R-squared	0.892380	Mean dependent var	2.917196
Adjusted R-squared	0.886591	S.D. dependent var	1.334377
S.E. of regression	0.275438	Sum squared resid	31.02928
F-statistic	154.1548	Durbin-Watson stat	1.112303
Prob(F-statistic)	0.000000		

Source: E-views Output

Based on the regression output on the fixed effect model, the adjusted R-squared value of 0.892380 indicates that the independent variables are able to explain 89.23% of the dependent variable, while the remaining 10.77% is influenced by other factors not included in this study. Thus, it can be concluded that the independent variables provide almost all the information needed to explain changes in the dependent variable.
The F-statistical test is used to determine whether all independent variables in the model have a simultaneous effect on the dependent variable. If the calculated F value> F table, then Ha is accepted and H0 is rejected, which means that the independent variables jointly affect the dependent variable. Conversely, if the calculated F value <F table, then Ha is rejected and H0 is accepted, which indicates that no independent variables affect the dependent variable.

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Table 6. F. Statistical Test Results

R-squared	0.892380	Mean dependent var	2.917196
Adjusted R-squared	0.886591	S.D. dependent var	1.334377
S.E. of regression	0.275438	Sum squared resid	31.02928
F-statistic	154.1548	Durbin-Watson stat	1.112303
Prob(F-statistic)	0.000000		

Source: E-views Output

Based on the table above, it is known that the calculated F value generated is 833.9568, while the F table value with df: 0.05, (6 – 1 = 5), (432 – 6 = 426) is 2.214. Since the calculated F value (833.9568) is greater than the F table value (2.214), it can be concluded that Ha is accepted while H0 is rejected. This shows that the independent variable simultaneously affects the dependent variable. In other words, the regression equation formed is considered to meet the fitness criteria.

The t-statistical test shows how far the influence of one independent variable individually (partial) in explaining the variation of the dependent variable. The way to do the t-test is by comparing the statistical value of the t-count with the t-table. If the value of t count > t table, then Ha is accepted while H0 is rejected; it can be concluded that the independent variable partially affects the dependent variable. If the value of t count < t table, then Ha is rejected, while H0 is accepted, and it can be concluded that the independent variable does not affect the dependent variable.

Table 7. t-Test Result

Variable	Coefficient	Std. Error	t-Statistic	Prob.
BANKSIZE	-0.390378	0.082480	-4.733011	0.0000
INFLATION	-0.074124	0.033345	-2.222927	0.0268
GDP	0.684355	0.128014	5.345932	0.0000
CREDITRISK	0.090602	0.022896	3.957158	0.0001
OER	1.838055	0.211126	8.705969	0.0000
C	-0.538214	2.236715	-0.240627	0.8100

Source: E-views Output

The table above shows each t-statistic value, while the t table with df: 0.05 (432 – 6 = 426) is 1.649. The following are the results of the t-test for each independent variable on the dependent variable.

1. *The Influence of Bank Size on Performance*
   The Bank Size variable has a t-count of -4.733011, which is greater than the t-table value of 1.649 and has a significant value (Prob.) of 0.0000, which is less than the significance level 0.05, as shown in the E-views output above. It can therefore be concluded that the Bank Size variable affects performance.
2. *The Influence of Inflation on Performance*
   According to the E-views output, the t-count value of Inflation is -2.2222927, which is higher than the t-table value (1.649), and with a significant value (Prob.) of 0.0268 less than the significance threshold (0.05), it can be inferred that the Inflation variable affects performance.
3. *The Influence of Credit Risk on Performance*
   Based on the E-views output, the t-count value of Credit Risk is 3.957158, which is greater than the t-table value (1.649), with a significant value (Prob.) of 0.0001 smaller than the significance level (0.05), so it can be concluded that the Credit Risk variable affects performance.
4. *The Influence of Gross Domestic Product (GDP) on Performance*
   It can be concluded that the Gross Domestic Product (GDP) variable affects performance based on the E-views output. The t-count value of Gross Domestic Product (GDP) is 5.345932, which is greater than the T-table value (1.649), with a statistically significant value (Prob.) of 0.0000, which is less than the significance level (0.05).
5. *The Influence of Operating Expenses and Operating Revenue (OER) on Performance*
   The Operating Expenses and Operating Revenue (OER) variable has a t-count of 8.705969, more significant than the t-table value of 1.649, and has a significant value (Prob.) of 0.0000, which is less than the significance level of 0.05, as shown in the E-views output. It can therefore be concluded that the Operating Expenses and Operating Revenue (OER) variable affects performance.

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DISCUSSION

Effect of Bank Size on Performance

Based on the test results using the fixed effect cross-section model with the Seemingly Unrelated Regression (SUR) method, the regression coefficient value for the Bank Size variable is -0.632242 with a p-value of 0.0000. These results indicate that Bank Size has a negative and significant effect on the performance of commercial banks at a 5% confidence level. The larger the size of a bank, the lower its performance. This indicates that banks with a larger scale may face challenges in operational efficiency, risk management, or other structural factors that can affect profitability and overall performance effectiveness. The results of the study indicate that Bank Size has a negative and significant relationship to the performance of commercial banks, which means that the larger the size of a bank, the lower its performance level. This can happen because large banks tend to have higher operating costs, stricter regulatory burdens, and challenges in managing credit and liquidity risks. In addition, aggressive expansion without being balanced by an effective management strategy can lead to decreased profitability. Therefore, although the scale of a large bank provides advantages in competitiveness and financial stability, effectiveness in resource management and business strategy remains the main factor in determining the overall performance of the bank. Research by Yuga shows that bank size has a positive effect on bank performance [8]. Another study by Neeraj Gupta & Jitendra Mahakud concluded that bank size has a negative impact on performance. The inverse relationship between bank size and performance indicates that large-scale banks do not always benefit from an economic perspective due to the high operational costs that must be incurred. Increasing bank size can lead to a spike in marketing costs, information asymmetry, and bureaucratic costs, which ultimately contribute to the negative relationship between profitability and bank size [9].

Effect of Operating Expenses and Operating Revenue (OER) on Performance

The test results show that the Operating Expenses and Return Expenses (OER) variable has a regression coefficient of 1.577067 with a p-value of 0.0000, which indicates a positive and significant relationship to the performance of commercial banks at a 5% confidence level. This means that the higher the OER, the higher the bank's performance. This positive relationship reflects that operating expenses and return expenses play an important role in determining bank profitability and efficiency. Although high operating costs are often considered a burden, in certain contexts, well-managed expenses can drive improved service quality, product innovation, and efficiency in financial management, which ultimately have a positive impact on company value. Thus, decisions related to funding and managing operating costs are crucial factors in determining the success and competitiveness of commercial banks in the financial market. Researcher Sukmadewi found that performance has a negative and significant effect on operating costs/business income. The higher the ratio of operating costs to operating income, the lower the efficiency of the bank's operational activities. Thus, it can be concluded that Operating Expenses and Return Expenses (OER) have a positive relationship with commercial bank performance, although the effectiveness of operational cost management remains the main factor in determining the level of bank profitability and efficiency [10].

Effect of Credit Risk on Performance

Credit risk is one of the main factors affecting the performance of commercial banks and is often proxied by Non-Performing Loans (NPL) and Non-Performing Financing (NPF). Based on the test results, credit risk has a regression coefficient of 0.104047 with a p-value of 0.0000, which indicates a positive and significant relationship to bank performance at a 5% confidence level. This positive relationship indicates that increasing credit risk can contribute to improving bank performance under certain conditions. This can happen if the bank can manage credit risk effectively by implementing appropriate mitigation strategies, such as diversifying the loan portfolio, implementing strict risk management, and selective credit policies. In addition, banks that have a good credit recovery strategy can maintain profitability even though they face increasing credit risk. However, if credit risk is not managed properly, increasing non-performing loans can have a negative impact on the bank's financial stability in the long term. Therefore, the balance between credit expansion and risk management is a key factor in maintaining the sustainability of commercial bank performance. Research by Yuga shows that the 'non-performing loan ratio' has a negative effect on bank performance, while the 'cost per loan asset' has a positive effect on bank performance [8].

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Effect of Inflation on Performance

Inflation is a macroeconomic factor that can affect the stability and performance of the banking sector. Based on the test results, the inflation variable has a regression coefficient of -0.121997 with a p-value of 0.0000, which indicates a negative and significant relationship to the performance of commercial banks at a 5% confidence level. This means that when the inflation rate increases, bank performance tends to decline. The negative impact of inflation on bank performance can occur because increasing inflation is often followed by an increase in interest rates, which causes borrowing costs to become more expensive, so that credit demand decreases. In addition, high inflation can also increase the risk of default because people's purchasing power and the ability of debtors to meet their financial obligations decrease. This condition can have an impact on increasing Non-Performing Loans (NPL) and reducing interest income, which is the main source of bank profitability. Therefore, managing inflation risk is an important factor for banks in maintaining stable and sustainable financial performance. Another study by Almansour shows that bank performance is greatly influenced by inflation. Interested parties can pay attention to other macroeconomic variables to investigate the impact of macroeconomic factors on bank performance. Further research should not only consider the banking sector but also other sectors in the financial market [11].

Effect of Gross Domestic Product (GDP) on Performance

Based on the test results, the regression coefficient value for the Gross Domestic Product (GDP) variable is 0.956768 with a p-value of 0.0000, which indicates a significant positive relationship between GDP and commercial bank performance at a 5% confidence level. This indicates that the higher the GDP value, the higher the performance of commercial banks. When GDP increases, domestic economic activity tends to be more active, which has an impact on increasing demand for credit, investment, and other financial transactions. This provides an opportunity for banks to increase revenue from the credit sector, interest rates, and other banking services. In addition, strong economic growth also increases people's purchasing power and investor confidence, which contributes to the stability of the banking system. Conversely, when GDP slows down or declines, economic activity tends to slow down, which can lead to an increase in the risk of non-performing loans (NPLs), decreased demand for loans, and reduced liquidity in the financial sector. This can hurt the profitability and overall performance of the bank. Therefore, the relationship between GDP and commercial bank performance is positive and significant, where increasing GDP tends to encourage the growth of the banking industry, while economic slowdown can be a challenge for bank financial stability. Previous research by Oswell showed that commercial bank performance in Zimbabwe is significantly related to bank management cost efficiency, capital adequacy, bank size, and economic growth, and is not significantly related to diversification, risk costs, deposit growth, and liquidity [12].

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