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Analysis The Determinants Affecting Banking Performance

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Abstract: The research aims to test the effect of bank-specific and macroeconomic factors on bank performance in Indonesia. The research uses hypothetical testing to examine the determinants affecting bank performance. This study uses panel data regression to analyze the data. The samples are determined by purposive sampling method used 34 commercial banks listed on Bursa Efek Indonesia (BEI) with 238 unit-observed during the period 2017 to 2023. The results show bank size, bank capital, liquidity, and inflation rate have a positive effect on net interest margin. Furthermore, this study can be used as a reference for investors and banking management.

Keywords: Bank Capital, Bank Size, Liquidity, Net Interest Margin

INTRODUCTION

In year 2020, World Health Organization (WHO) announced Covid-19 pandemic harming global health (Sohrabi et al., 2020). Besides weakening global health, the pandemic has a multiplier effect in lowering world economy (Mckibbin et al., 2020). According to World Bank, economic growth in 2020 was -3,1 percent which has lower growth than in 2019, 2,6 percent. However, in 2021, the economy had cured showed the increasing become 5,9 percent. The economic growth has been stable till the end of year 2023 and still on going. Indonesia is one of many countries affected the pandemic. In accordance with Ministry of Finance of the Republic of Indonesia (Ministry of Finance), the pandemic caused Indonesia in recession period. The recession happened when the economic growth being minus in two quarters, respectively. The recession took place in Q2 and Q3 – 2020 with -5,32 percent and -3,49 percent, respectively (Badan Pusat Statistik, 2020). The economic declining indicated the pandemic had an aftermath in many sectors.

Indonesia Government undertook to move the economic activities through National Economic Recovery (PEN), which one of the actions by means of banking sector. The policy undertaken by the government was a strategy in credit facilitation in the way of Peraturan Otoritas Jasa Keuangan 11/POJK.03/2020. The strategy led to financial risks, such as liquidity risk, credit risk, and systematic risk (Ali et al., 2022). The risks could cause in reduction of banking performance (Killins et al., 2020). Ali et al. (2022) stated bank's performance is measured by bank's profitability. The study affirmed the profitability proxied by net interest margin.

Credit risk becomes the most parameter used by stakeholders to quantify banking performance quality. Siddique et al., (2022) disclosed credit risk could be quantified with nonperforming loans (NPL) and capital adequacy ratio (CAR). Credit policy during PEN caused increasing trend of NPL as well as CAR. Nevertheless, OJK, (2022) declared credit risk has been recovered described by declining of the ratio of NPL gross in July 2022 with the value of 2,86 percent to NPL gross in July 2021 with the value of 3,24 percent, year-over-year. Credit facilitation caused by the pandemic was in declining trend showing the debtor ability in credit repayments. The ability in credit repayments could affect on banking performance improvements.

Previous study from Ali et al., (2022) undertaken in India exposed the determinants affecting banking profitability were bank-specific and macroeconomic factors. The bank-specific factors included bank size, bank capital, liquidity, and credit risk, meanwhile the macroeconomic factor included inflation rate. The results of the study showed bank capital has a positive influence on banking performance while credit risk and inflation rate have an inverse effect. Based on the explanations, this paper is going to explain the determinants of the banking performance. Moreover, this paper is going to analyze the impact of the financial crisis happened caused by the pandemic with dummy variables. Thus, this paper is object to emphasize, convince, and get the information about the factors both bank-specific and macroeconomic factors work on banking performance in commercial banks listed on Indonesia Exchange Stock during period 2017 to 2023.

Banking Performance

Nthenge & Ringera, (2017) explained banking performance is the bank's financial health in certain period which can be quantified by profitability. In accordance with Aymen et al., (2022), profitability is the measurement of bank's triumph in gaining the sufficient profit to maximize shareholder's wealth and to grow the financial. Menicucci & Paolucci, (2016) emphasized profitability refers to bank's ability to maintain the banks's benefit every year. Bank's profitability showed the success level of bank's management and as an performance indicator for investors at a time. Increasing in bank's profitability will advance the cash flow position and the flexibility of the internal financing. Profitability enhancing is the important thing in rising shareholder's value. Ali et al., (2022) used net interest margin as the calculation of bank's profitability. Rahman et al., (2015) stated net interest margin is the ratio of a difference between interest earned and interest expended to total assets. As stated by Menicucci & Paolucci, (2016) net interest margin reflects the bank's profitability in interest-earning business. Thus, net interest margin gauged the profit gained from interest activities.

Iftikhar, (2016) said that net interest margin is the value of net interest income divided by total assets. Net interest income is the difference between interest income received from assets and interest expense paid to liabilities. The more net interest margin gained, the more effective asset management the bank did. Cruz-García et al., (2020) explained net interest margin reflects the disparity of interest charged of the loans and interest paid of the deposits. Net interest margin ran into improvements in Q2-2022 with increasing value of 4,66 percent to 4,78 percent, year-on-year. Escalation in net interest margin was relevant to the growth in net interest revenue with the value of 12,76 percent year on year compared to the growth of earning assets noted as 9,74 percent year-on-year.

Bank Size and Banking Performance

The bigger bank size will have possibility in enhancing economies of scales till certain level. However, excessing the bank size in certain level will cause diseconomies of scales. Previous researches by Menicucci & Paolucci, (2016), Chen et al., (2018), and Abdullah et al., (2014) found a positive relationship between bank size and net interest margin. Enhancing

economies of scales will ease the banks in doing business expansion, such as increasing the credits and developing the technology, that will rise the bank's profit and make more profitability. On the other hand, Bouzgarrou et al., (2018), Batten & Vo, (2019), dan Dwumfour, (2019) found an inverse relationship between bank size and banking performance. The bigger bank size causes the more cost inefficiency so that will lower bank's interest margin (Al-muharrami & Murthy, 2017). The bigger bank size will also give a chance to banks to expand the fee-based business that lower interest revenue. Based on the arguments, the first hypothesis can be formulated below.

H1: bank size affects banking performance

Bank Capital and Banking Performance

The regulation of OJK 11/POJK.03/2016 stated bank capital consists of core capital (Tier 1) and supplementary capital (Tier 2). In agreement with OJK, bank capital is the capital adequacy ratio with the value of threshold has been appointed by Bank for International Settlements (BIS) at least 8 percent. OJK also said that the bank capital of commercial banks was increasing. The position of bank capital excesses the threshold with the enhancement from 24,3 percent to 24,73 percent, year-to-year. The bank capital excessing the threshold showed the ability of the banks facing the risks. Banks that have the capability of maintaining capital adequacy tend to have possibility to expand the market with expansion of bank's activity such as insurance and collateral, thus will rise the profit. Bank capital indicates the bank's capability of getting deposit demand and covering customer's reserve fund during financial crisis (Ali et al., 2022). Kablay & Gumbo, (2021) suggests bank capital can be measured by the ratio of bank capital to risk-weighted assets, which is bank capital quantified by the summation of Tier 1 capital and Tier 2 capital. Majumder & Li, (2018) said the more bank capital ratio the lower bank's leverage taking behaviour. Hence, it will give the banks opportunity to have expected profit. Bank capital also marked as banks' credit-worthiness and loss aversion ability (Iftikhar, 2016). The explanations is relevant to the studies from Ali et al., (2022), Le, (2017), Dietrich & Wanzenried, (2013), dan Kirimi et al., (2022a) finding net interest margin is influenced positively by bank capital. The capital adequacy makes the banks get market opportunities and increase the earnings (Kohlscheen et al., 2018). As stated by the arguments, the second hyphotesis can be formulated below.

H2: bank capital affects net interest margin.

Liquidity, Credit Risk, and Banking Performance

Liquidity shows that banks can use deposits to give loans (Al-muharrami & Murthy, 2017). Liquidity is stated as the loans given by the banks compared to the deposits the banks got (Siddique et al., 2022). Petria et al., (2015) said the good liquidity has an ability to fullfil the obligation in downturn condition. The calculation of liquidity based on total loans defined as the more liquidity the banks have, the more liquidity risks the banks have. That means the banks will have difficulty to fulfill the obligation. Banks that have higher liquidity will be less liquid. Hence, the higher the loans the higher credit risks (Li & Zou, 2014). OJK explaines credit risk stated by NPL can be divided into two categories, NPL gross and NPL net. NPL gross is the comparation of total credit categorized as substandard, doubtful, and loss and total loans, while NPL net is the ratio of total credit categorized as loss and total loans. Higher NPL will lessen banking profit and lower profitability. According to Kohlscheen et al., (2018) dan Abdullah et al., (2014) liquidity affects inversely on banking performance. High loans can lead to default risk which means customers will not able to pay the credit so the bank's revenue will lessen and make lower net income. In contrary, Bouzgarrou et al., (2018) dan Le, (2017) found that liquidity positively affects net interest margin. The higher loans the banks give, the more profitable the banks are. Loans become important factor in gaining interest revenue (Al-

muharrami & Murthy, 2017; Majumder & Li, 2018). In line with the statements, the third and fourth hypotheses can be concluded below.

H3: liquidity affects banking performance
H4: credit risk affects banking performance

Inflation Rate and Banking Performance

Inflation is systematic risk that can influence interest rate and loan rate (Al-muharrami & Murthy, 2017). The influence of inflation rate of banking profitability is determined by the anticipation level which means banks that can estimate the inflation rate fluctuation tend to be capable of adjusting interest rate to improve revenue and vice versa. High inflation rate indicates high banking cost operating (Salike & Ao, 2018). Bank activities tend to increase during the stable macroeconomic periods. Salike & Ao, (2018) calculated inflation rate by annual consumer price index (CPI) in percentage. The influence of inflation rate in profitability determined by whether salaries, wages, and other operating expenses rises faster than the inflation (Alhassan et al., 2016). When banks can not anticipate the inflation and can not adjust interest rate well, there will be opportunity cost which appears quicker than revenue. Thus, it will decrease the profit. The arguments are relevant to the study from Ali et al., (2022), Dwumfour, (2019), and Kohlscheen et al., (2018) that stated net interest margin is affected inversely by inflation rate. Opposite result study from Abdullah et al., (2014) found that inflation rate has a positive effect on net interest margin. That will happen when banks can adjust the interest rate with the inflation rate. In accordance with the arguments, the fifth hypothesis will be formulated below.

H5: inflation rate affects banking performance

In line with those descriptions explained, it can be formulated the research framework title “Analysis Determinants Affecting Banking Performance” as follo

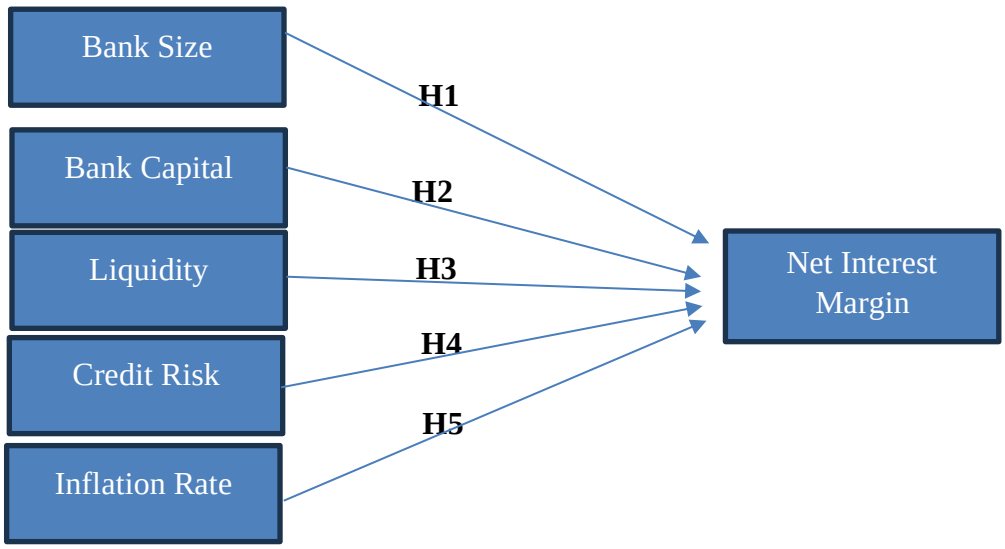

Figure 1. Research Framework

METHOD

This study used quantitative method approach. This research used hypothetical testing to analyze the determinants affecting banking performance. The data were collected as panel data which combining time-series data and cross-section data. The samples were determined by purposive sampling to define unit-observed, which were 34 commercial banks listed on Indonesia Exchange Stock over period 2017 to 2023. This study used Eviews to process and analyze the data.

This study used net interest margin as dependent variable, and used bank size, bank capital, liquidity, credit risk, and inflation rate as independent variables. The measurement of those variables is shown Table 1.

Tabel 1. Variable and Measurement

Variable		Measurement	Source
Dependent Variable			
NIM		NIM = net interest income* / total assets Net interest income* = interest revenues – interest expenses	Rahman et al., (2015)
Independent Variable			
1.	BZ	BZ = logarithm (total assets)	Ali et al., (2022)
2.	CAP	CAP = total equity* / risk weighted assets (total equity* = tier 1 + tier 2)	Kablay & Gumbo, (2021)
3.	LIQ	LIQ = total loans / total deposits	Al-muharrami & Murthy, (2017)
4.	CR	CR = nonperforming loans / total loans	Siddique et al., (2022)
5.	INF	INF = annual consumer price (%)	Salike & Ao, (2018)

RESULTS

Panel data regression was tested to identify and analyze the correlation of the independent variables (bank size, bank capital, liquidity, credit risk, and inflation rate) and the dependent variable (net interest margin) through processing data Eviews 12.0. The equation can be settled using the following model.

$$NIM_{it} = \alpha + ß_1\, BZ_{it} + ß_2\, CAP_{it} + ß_3\, LIQ_{it} + ß_4\, CR_{it} + ß_6\, INF_t + e_{it}$$

Where: NIM_{it}: net interest margin bank i year t; BZ: bank size bank i year t; CAP: bank capital bank i year t; LIQ: liquidity bank i year t; CR: credit risk bank i year t; INF: inflation rate year t; α: constant; ß: coefficient; e: error.

The testing used panel data regression had to choose the output model which was consist of common effect model (CEM), fixed effect model (FEM), and random effect model (REM). The model was chosen by Chow test, Hausman test, and Lagrange multiplier test for determine the model used to interpret the results. The model selection was shown in Table 2.

Table 2. The Model Selection

Model Testing	Probability	Decision	Conclusion
Chow Test			
NIM	0,0000	H_0 rejected	FEM
Hausman Test			
NIM	0,2508	H_0 accepted	REM
Lagrange Multiplier Test			
NIM	0,0000	H_0 rejected	REM

Source: Processed data by *Eviews*

Based on model selection testing shown Table 2, the result of chow testing had p-value less than α (0,05) meaning H_0 was rejected and the model chosen was FEM. Then, in line with hausman test obtained p-value more than α (0,05) so H_0 was accepted and the model chosen was REM. Lagrange multiplier test had to be done because the best model had not been fixed. P-value of lagrange multiplier test was less than α (0,05) and H_0 was rejected so the best model selected was REM.

Table 3. Descriptive Statistics

Variable	N	Min.	Max.	Mean	Std. Dev
Net Interest Margin	238	-0,023099	0,159744	0,038383	0,018225
Bank Size	238	11,82261	15,29337	13,67565	0,789676
Bank Capital	238	0,107804	1,699183	0,304637	0,212798

Liquidity	238	0,103547	0,869452	0,593117	0,120025
Credit Risk	238	0,000000	0,157525	0,027509	0,021589
Inflation Rate	238	1,6	4,2	2,9	0,8

Source**:** Processed data by *Eviews*

According to Table 3, the study had 238 units observed. The data interpretation explained that net interest margin has a value of mean 0,038383 and a value of standard deviation of 0,018225. Bank size has a value of mean 13,67565 and the value of standard deviation of 0,789676. Bank capital has a value of mean 0,304637 and the value of standard deviation of 0,212798. Liquidity has a value of mean 0,593117 and a value of standard deviation of 0,120025. Credit risk has a value of mean 0,027509 and a value of standard deviation of 0,021589.

Table 4. The Results

Independent Variables	Net Interest Margin		
	Coefficient	P-value	Decision
Constant	-0,091965	-	-
Bank Size	0,006986	0,0103**	H_0 rejected
Bank Capital	0,009832	0,0871*	H_0 rejected
Liquidity	0,041999	0,0001***	H_0 rejected
Credit Risk	-0,033991	0,4814	H_0 accepted
Inflation Rate	0,002661	0,0027***	H_0 rejected
Adj. R^2	0,1272		
F-prob	0,0000		H_0 rejected

Note: *) significance level at 10%; **) significance level at 5%; ***) significance level at 1%

Source**:** Processed data by Eviews

Based on Table 4, goodness of fit of this study is 0,1272 meaning that the independent variables can inform the variance of the dependent variable of the value 12,72 percent and the rest is informed by other variables not included in this study. The value of F-prob means one of the independent variables can affect the dependent at least. Hence, the goodness of fit and F-prob results show that this study is valid.

The partial test results show bank size has a coefficient value of 0,006986 and a p-value of 0,0103 which means bank size has a positive correlation with net interest margin at 5 percent significant level. It means the more assets the banks have, the more interest revenue the banks gain. It is relevant to the economies of scale informing the bigger banks has more opportunity to run the traditional business.

Bank capital has a coefficient value of 0,009832 and a p-value of 0,0871 so that bank capital affects positively net interest margin at 10 percent significant level. It shows the more banks reserve their capital, the more the interest revenue the banks get. It refers banks have enough capital-reserved to be careful in case of facing a crisis.

Liquidity has a coefficient value of 0,041999 and also a p-value of 0,0001. It means liquidity has a positive effect on net interest margin at 1 percent significant level. The result informs that the more banks give the loans to customers, it will generate the more interest revenue. Meanwhile, credit risk has no impact on net interest margin. The amount of NPL will not make any significant effect on the amount of interest revenue.

Inflation rate has a coefficient value of 0,002661 and a p-value of 0,0027 so that inflation rate has a positive effect on net interest margin. Banks that can adjust the volatility of the inflation rate with the interest rate will generate more interest revenue than the banks can not. The adjustment must not cause a loss for both the bank itself and the customers.

DISCUSSION

The results of the study demonstrate the determinants that can affect the banking performance calculated by net interest margin. All of the determinants that influences the dependent significantly has a positive relationship. The results can be emphasized in several sections.

The result of the study is bank size positively influence net interest margin which is in line with the studies from Menicucci & Paolucci, (2016), Chen et al., (2018), and Abdullah et al., (2014) Banks that have bigger size, which means bigger assets, will have more opportunity to give more loans. The bigger assets will also lead the banks to improve the economies of scales till certain level. The improvement will ease the banks to enlarge the business expansion, such as the ease of loans terms. Assets are consist of liabilities and capitals. When the banks receive the capitals from shareholders, they will not be expanded with interest expense (Abdullah et al., 2014). The capitals can be used for helping the customers who lack of funds accounted for loans. The loans will generate interest revenue for the banks, so if the high interest revenue is not balanced with interest expense, the banks will have high net interest revenue and increase the net interest margin.

The positive correlation result between bank capital and net interest margin is similar to the findings from Ali et al., (2022), Le, (2017), Dietrich & Wanzenried, (2013), dan Kirimi et al., (2022a). Bank capital denotes the capability of getting the deposit demand dan looking after the reserved funds. The higher capital the banks have, the lesser bank's leverage taking behavior, so it will give the occasion to have expected profits. The banks which can maintain the capital adequacy tend to be able to widen their market. The safer banks with the high capital will less pay the deposit rate to depositors. That will lessen the funding costs and generate higher net interest (Le, 2017).

The finding of the relationship between liquidity and net interest margin is positive. Bouzgarrou et al., (2018) dan Le, (2017) found the same findings. In this study, liquidity means liquidity risk in which the banks will calculate the liquidity from the loans they gave. The more the loans the banks distribute from deposits, the more the gains the have (Al-muharrami & Murthy, 2017). Loans is the important thing to make interest income. The liquidity will be related to credit risk in which the debitors can not repay the loans in the maturity. As OJK Regulation number 15/POJK.03/2017, the banks that have NPL more than 5 percent of total credits categorized as unhealthy banks. However, there are so many banks listed in Indonesia Exchange Stock that have the NPL more than 5 percent but the result of the study revealed that the NPL does not affect the interest revenue. It could be when the banks give the loans to customers, the customers could have repaid the loans but in a difficult way. Hence, the condition occurs as if the customers repayment did not affect the interest revenue.

Based on the result, inflation rate has a positive relationship with net interest margin. Abdullah et al., (2014) found the same result as this study. Inflation rate is one of systematic risks influencing interest rate and loan rate (Al-muharrami & Murthy, 2017). Inflation can decide the cost and the revenue. Banks that can avoid the inflation volatility will not suffer to the condition. When the banks survive from the inflation volatility, they tend to increase the revenue and the profit, and vice versa. Credit activities can drive the banks in keeping the revenue even rise it are giving the fixed rate financing. Nevertheless, the banks should calculate it in detail instead of the possibility of increasing inflation in a sudden. Moreover, when the inflation rate is high, the banks shall do enhancement credit risk and monitor the credit quality intensively because of the customers tend to repay the credits hard.

CONCLUSION

This study clarifies the determinants which affect the banking performance by analyzing the effect of bank size, bank capital, liquidity, credit risk, and inflation rate on net interest

margin. The test used panel data regression shows net interest margin is affected by bank size, bank capital, liquidity, and inflation rate positively. The banks management must see the results to refer the determinants of banking performance.

This study contributes to investors and bank's manager. For investors, they should pay attention to the factors increasing banking performance, especially net interest margin. Investors could focus on the factors, such as bank size, bank capital, and liquidity if they want to invest their funds in banking sector. Investors also see the macroeconomic condition, especially inflation rate, by monitoring the fluctuation.

For bank's managers, to increase net interest margin they can enlarge the total assets for distributing to the debitors. Asset management for credit should notice the risk management so that credit risk can be minimized. The loans distributed can generate the interest revenue to enhance the profit. Moreover, when the inflation rate increases, the bank managers can apply the strategies such as enhancement credit risk and monitoring credit quality.

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