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The Effect of Internet Banking, Size, NPL, and CAR on Net Interest Margin (NIM) and Banking Efficiency in Indonesia During Covid-19 Pandemic

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ABSTRACT: *This study analyzes the effect of Internet Banking, Size,* NPL*, and* CAR *on the profitability and efficiency of Indonesian banking as proxied by Net Interest Margin* (NIM) *and Operating Costs and Operating Income* (BOPO) *during the* COVID-19 *pandemic (2020-2021). This study also looks at the effect of Firm Size (Size), Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL) on profitability and efficiency in that period. The population is Indonesian conventional banks registered in* Bank Indonesia *(2020-2021), totaling 117 banks. The sample was determined using purposive sampling, 62 banks in total. The method used is multiple linear regression with dummy variables. The results showed that internet banking had a significant negative effect on NIM and a significant positive effect on BOPO. Another variable, size, does not affect NIM and significantly negatively affects BOPO. CAR does not affect NIM and has a significant negative effect on BOPO.*

Banks are expected to pay more attention to the level of capital adequacy, credit risk, and total assets to increase bank profitability and efficiency in the future in dealing with the pandemic. Meanwhile, NPL has a significant negative effect on NIM and a significant positive effect on BOPO. NPL has the biggest influence on NIM; conversely, the factors that affect BOPO more are CAR and NPL.

Keywords: *Internet Banking, Net Interest Margin, Efficiency, Pandemic*

INTRODUCTION

Djalante et al. (2020) estimate that Indonesia will be affected for a long time. In addition to the health sector, the economic sector has been severely impacted by the outbreak of

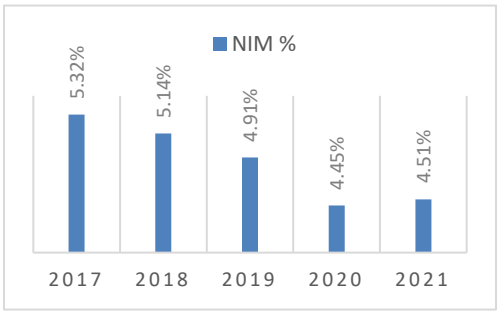
COVID-19; as a result, financial institutions and the banking system have become very fragile. Banking plays an important role in the growth of economic stability.

Knowing the determinants that can affect the bank's profitability is important to take advantage of the positive impacts and overcome them. One way that can be used to measure a bank's performance is to look at the bank's profitability.

One measure of profitability in the banking sector can be measured using the Net Interest Margin (NIM), which is used to calculate the difference between interest income received from loans and interest expense paid to customers who deposit their funds in banks. The level and dynamics of the net interest margin will indicate the efficiency of financial intermediation (Plakalovic, 2015).

In 2020, the Net Interest Margin (NIM) trend of banking was getting thinner in line with the pressures of the COVID-19 pandemic. The decline in credit quality and the restructuring scheme carried out by banks will further erode margins. Banks have also revised the NIM target to adjust to the current conditions. At the beginning of the year, projections are no longer relevant to the pandemic.

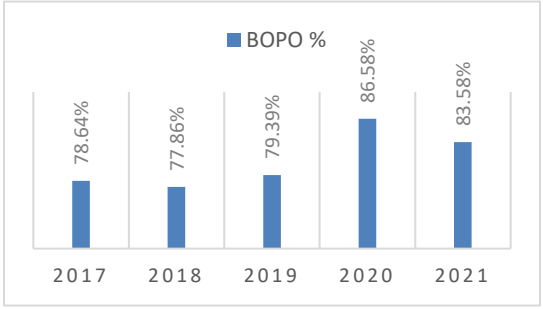
Figure 1. NIM Ratio of Conventional Banks Period 2017 – 2021



Source: IDX.com

Public spending is decreasing again, limiting economic activity to suppress the coronavirus. As a result, many businesses need help to apply for credit from banks. This condition impacted the performance of bank lending, which of course, began to erode the NIM of the bank itself. Roxana (2021) said the COVID-19 pandemic had accelerated digitalization in the banking system. The need for innovation and digital strategy had become an important factor in banking even before the pandemic began.

Figure 2. BOPO Ratio of Conventional Commercial Banks Period 2017-2021



Source: IDX.com

The figure above shows an increase in the BOPO ratio over the last three years. However, digitalization in the banking sector can make banks more efficient during the pandemic. Bank Indonesia is looking to improve efficiency in banking operations due to labor and rental costs decline due to digitalization, which decreased by three bps yoy and five bps yoy, respectively, until January 2021. Haru Koermahargyo, President Director of BTN, said the decline in BOPO was contributed by a decrease in several components of operating expenses and an increase in operating income. On the operational expense side, in addition to the significant reduction in interest expense, a decrease was seen in rental, procurement, and outsourcing costs, along with the closure of several outlets for efficiency and switching to digital transactions.

Weill and Woerner (2015) report increased revenue growth and profit margins for companies embracing digital technologies and operating in digital ecosystems. Susanti (2019) Digital banking innovation improves banking performance in Indonesia by reducing costs and increasing revenue. However, the study conducted by Muhammad Arif and Erni Masdupi (2020) concluded that internet banking has a negative and insignificant effect on banking performance, and size and capital have a positive and significant effect. Credit risk, cost management, and economic growth have a negative and significant effect on banking performance. Meanwhile, liquidity and inflation have a negative and insignificant effect on banking performance.

Apart from Internet Banking, several things can affect the NIM and BOPO, including Company size, NPL, and CAR. From the description above, the researcher is interested in conducting research and analyzing how much influence Internet Banking, Size, NPL, and CAR have on Net Interest Margin and BOPO in Indonesian banking during the COVID-19 pandemic.

LITERATURE REVIEW

Grand Theory (*Signalling Theory*)

Signaling theory explains that good financial statements are a signal or sign that the company has also been operating well. A good signal will be responded well by the other party. This theory emphasizes the importance of the information issued by the company on the investment decisions of parties outside the company (Butarbutar, 2011 in Elmawati and Yuyetta, 2014).

Bank

According to Kasmir (2014), "Banks are companies engaged in finance, meaning that banking activities are always related to finance. So talking about banks cannot be separated from financial problems."

Internet Banking

Internet Banking is one of the bank's services that allows customers to obtain information, communicate and conduct banking transactions through the Internet network and is not a bank that only provides banking services via the Internet, so the establishment and activities of internet-*only banks* are not allowed (Bank Indonesia, 2013).

COVID-19 Pandemic

The COVID-19 outbreak started in Wuhan, China. On December 31, 2019, the WHO China Country Office reported a case of pneumonia of unknown etiology in Wuhan City, Hubei Province, China.

The Effect of Internet Banking on Net Interest Margin (NIM)

Md. Nur Alam Siddik et al. (2016) show that e-banking positively impacts bank performance, measured in ROE, in Bangladesh with a two-year lag. This study also reveals a positive but insignificant impact of e-banking on ROA and NIM. The hypothesis can be formulated,

H1: There is a significant positive effect of Internet Banking on NIM.

The Effect of Firm Size on Net Interest Margin (NIM)

The larger the size of the bank, the higher the Net Interest Margin (NIM). Banks with large sizes will obtain large income from the postal credit distribution side because these banks provide a large portion of the credit (Raharjo et al., 2014). The relationship between firm size and Net Interest Margin is expressed in a unidirectional relationship by research by Raharjo et al. (2014) and Margaret (2014). So, it can be hypothesized,

H2: There is a significant positive effect of Firm Size on NIM.

The Effect of CAR on Net Interest Margin (NIM)

Research conducted by Purba (2018) and Pamuji (2014) concludes that the Capital Adequacy Ratio positively and significantly affects Net Interest Margin. Hoang (2015) also obtained the same study results, which concluded that the Capital Adequacy Ratio positively and significantly influenced the Net Interest Margin. So, the hypothesis,

H3: There is a significant positive effect of CAR on NIM

The Effect of NPL on Net Interest Margin (NIM)

Research conducted by Purba (2018) shows a negative effect, meaning that the higher the NPL ratio, the more NIM will decrease. This negative result can be explained that the more non-performing loans, the bank's interest income will decrease due to the tendency of debtors to fail to pay their obligations so that the interest margin received by the bank will decrease. The decrease in the margin received by the bank resulted in a decrease in the NIM obtained by the bank. Vice versa, if the NPL ratio is lower, a higher NIM ratio will be obtained because the non-performing loans experienced are low; hence the interest and principal gains are higher. Therefore, the hypothesis,

H4: There is a significant negative effect of NPL on NIM.

The Effect of Internet Banking on Operating Costs and Operating Income (BOPO)

The results show that digital banking significantly affects the efficiency of the company's operational performance as measured by BOPO. This result supports the implication that companies can minimize costs and maximize revenue by implementing digital banking innovation (Susanti, 2019). Then the hypothesis:

H5: There is a significant negative effect of Internet Banking on Operational Costs and Operating Income (BOPO)

The Effect of Firm Size on Operating Costs and Operating Income (BOPO)

Companies with large assets will tend to have greater economic resources and will tend to be able to reduce transaction costs so that their efficiency will be higher (Surifah, 2011). Then the hypothesis,

H6: There is a significant negative effect of Firm Size on Operating Costs and Operating Income (BOPO).

The Effect of CAR on Operating Costs and Operating Income (BOPO)

A bank with a higher CAR indicates a higher financial capacity to develop a business. Banks with higher CAR will be better able to anticipate losses due to non-performing credit risk. So that the greater the CAR, the higher the bank's efficiency (Sugeng, 2018). Then the proposed hypothesis,

H7: There is a significant negative effect of CAR on Operational Costs and Operating Income (BOPO).

The Effect of NPL on Operational Costs and Operating Income (BOPO)

banks always behave anticipatively towards credit risks that may be faced, namely by setting penalties for late payment of installments much higher than the collection fee and setting the amount of collateral whose liquidation value is higher than the loans provided. If the bank can determine the anticipation, then the increase in NPL in the low range can reduce the BOPO ratio, which means that the operational efficiency of a bank will increase. The results of this study by Maheswari (2014) have a negative effect on NPL on BOPO. In accordance with Maheswari's (2014) research, the hypothesis is,

H8: There is a significant positive effect of NPL on Operational Costs and Operating Income (BOPO).

METHODS

The research was conducted at Bank Indonesia. The data obtained is secondary data, collecting quantitative data by viewing and analyzing the annual reports and financial statements of commercial banks registered at Bank Indonesia in 2020-2021. The data sources have been published by Bank Indonesia (BI) (www.bi.go.id), Otoritas Jasa Keuangan (OJK) (www.ojk.go.id), Badan Pusat Statistik (BPS) (www.bps.go.id) as well as the company's website.

The sampling technique in this study is purposive sampling. The population of this study is commercial banks listed at Bank Indonesia, amounting to 117 banks. The details of the selection criteria for this research sample:

1. All banks registered in Bank Indonesia period 2020-2021, totaling 117 banks.
2. Banks that carry out business activities conventionally.
3. Data did not include foreign banks because this study only focused on Indonesian banks.
4. In research, bank data must be complete during the observation period, so banks with incomplete data are not included.

NIM (Net Interest Margin)

The NIM ratio is used to measure the ability of bank management to generate interest income by looking at the bank's performance in lending, considering that the bank's operating income is highly dependent on the difference between interest and loans. The following is the formula for Net Interest Margin (NIM),

$$NIM = (\text{Net Interest Income})/(\text{Average Earning Assets}) \times 100\%$$

(Bank Indonesia Letter No.13/24/DPNP dated October 25, 2011)

BOPO (Biaya Operasional dan Pendapatan Operasional)

This ratio measures the bank's efficiency in carrying out its operations. Cost-to-Income Ratio is the ratio used to describe the efficiency of cost management, reflecting the total cost incurred by the bank's management in its activities. This ratio measures the ability of bank management to control operational costs against operating income in their operational activities. Here is the BOPO formula,

BOPO = (Operating Expenses)/(Operational Income)×100%

(Kasmir, 2014)

Size

According to Brigham & Houston (2010:4), Firm size measures how big the company is as indicated by total assets, total income, and earnings after tax. The greater the number of assets/assets of the bank, the greater the size of the bank. Bank size can be formulated as follows:

SIZE = Ln (Total Assets)

(Margaretha, 2015)

CAR (Capital Adequacy Ratio)

CAR is a ratio that shows the number of bank assets that contain risks (investment credit, securities, claims on other banks) financed from their capital funds and obtaining funds from sources outside the bank. (Dendawijaya 2005). The CAR ratio is obtained using the formula:

CAR = Capital/ATMR x 100%.

(BI Regulation No. 13/PBI/2011)

NPL (Non-Performing Loan)

Non-Performing Loan (NPL) is a ratio used to compare loans that cannot be returned by debtors, better known as bad loans, with total loans disbursed by the public. The NPL commonly used is the net NPL, which is the adjusted NPL. NPL formula,

NPL = Non-Current Credit / Credit.

(Bank Indonesia Regulation Number 6/10/PBI/2004)

Data Analysis Method

This research uses descriptive statistics and multiple regression with dummy variables. According to Sugiyono (2016: 192), the definition of multiple linear regression analysis is a regression with one dependent variable and two or more independent variables. Regression analysis is a statistical analysis used to explain the relationship between a dependent variable Y

using one or more independent variables X. In all regression models, the dependent variable Y and the independent variable X are numerical or quantitative. Nevertheless, this is only sometimes the case; there are times when the explanatory variables can be qualitative. These qualitative variables are often known as artificial or dummy variables or dummy variables (Gujarati, 2006, p. 1).

Internet Banking dummy variable taking a value of 1 will be assigned to banks that use Internet Banking. Otherwise, a value of 0 is assigned to banks that have not used Internet Banking. The multiple regression equation with dummy variables can be formulated as follows:

Model 1

$$Y_1 = \alpha + \beta_1 D_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

NIM = α + β_1IBANK + β_2 SIZE + $\beta_3 CAR + \beta_4 NPL + \varepsilon$

Model 2

$$Y_2 = \alpha + \beta_1 D_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

BOPO = α + β_1IBANK + β_2 SIZE + $\beta_3 CAR + \beta_4 NPL + \varepsilon$

RESULT AND DISCUSSION

Descriptive Statistics Test

Descriptive Statistics Table

Descriptive Statistics					
	N	Minimum	Maximum	mean	Std. Deviation
IBANK D1	124	,0	1.0	,694	,4629
SIZE X2	124	11,973	21,241	17,33770	1.631159
CAR X3	124	,137	2.016	,30498	,240725
NPL X4	124	,000	.03	0.01495	0.016045
NIM Y1	124	,005	0.079	,0494	,411880
BOPO Y2	124	,073	2,345	,85799	,230704
Valid N (listwise)	124				

Source: SPSS Processed Data

Based on the table, it can be seen that the lowest minimum value is 0.000 for NPL, and the highest minimum value is 11.973 for size. The maximum value is 21.241 for size, and the lowest is 0 0.030 for NPL. The highest average value is 17 33770 for size, and the lowest is NPL of 0.01495.

Classic Assumption Test

1. Normality test

Table of Data Normality Test Results 1

After being tested for normality with the One-Sample Kolmogorov-Smirnov Test, the data is not normal because Sig. 0.00 < 0.05 and Sig. 0.00 < 0.05 means that there are *outliers*.

In this study, outlier data was overcome by trimming, which can be seen with Boxplot. So, after eliminating 23 outliers using Boxplot, the results of the One-Sample Kolmogorov-Smirnov are as follows.

Table of Data Normality Test Results 2

One-Sample Kolmogorov-Smirnov Test			
		Unstandardized Residual	Unstandardized Residual
N		101	101
Normal Parameters [a,b]	mean	,0000000	,0000000
	Std. Deviation	,01484019	,09584040
Most Extreme Differences	Absolute	,082	0.050
	Positive	0.058	0.050
	negative	-,082	-,050
Test Statistics		,082	0.050
Symp. Sig. (2-tailed)		,094 [c]	,200 [c,d]

Source: Processed SPSS

Based on the table above, the significance value for all variables is Sig. 0.094 > 0.05 and Sig. 0.200 > 0.05. Thus, the analyzed data met the criteria for the normality test.

2. Multicollinearity Test

Table of Multicollinearity Test Results

		Tolerance	VIF
1	(Constant)		
	IBANK D1	,677	1,477
	SIZE X2	,699	1,431
	CAR X3	,973	1.028
	NPL X4	,859	1.164

Source: Processed SPSS

From the above output, all VIF values are not greater than 10, and *tolerance* is greater than 0.1. Thus, it can be concluded that the regression model is free from multicollinearity.

3. Heteroscedasticity Test

The results of the heteroscedasticity test can be seen in the results of processing using SPSS, namely as follows:

Abs_RES1 Heteroscedasticity Test Results Table

Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,033	0.014		2,328	,022
	IBANK D1	-,001	,003	-,049	-,401	,689
	SIZE X2	-,001	.001	-,147	-1,227	,223
	CAR X3	-,016	0.016	-,104	-1.028	,306
	NPL X4	,000	,135	,000	-,002	,998

Source: Processed SPSS

From the Glejser test in the table, it can be seen that Sig. each variable is more than 0.05. Therefore, there is no symptom of heteroscedasticity in the regression model, so the regression model is feasible to use.

Abs_RES2 Heteroscedasticity Test Results Table

Coefficients [a]						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	,169	,109		1.546	,127
	SIZE X2	-,006	,005	-,138	-1.133	,261
	CAR X3	,168	,115	,169	1,455	,150
	NPL X4	-1,779	1,001	-,213	-1,777	0.080

Source: Processed SPSS

From the geyser test in the table, it can be seen that Sig. each variable is more than 0.05. Therefore, there is no symptom of heteroscedasticity in the regression model, so the regression model is feasible to use.

4. Autocorrelation Test

Table of Autocorrelation Test Results for Dependent Variables NIM

Model Summary [b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,390 [a]	,152	,117	,015146	1,860

Source: Processed SPSS

Based on the SPSS output above, dw > dU, 1.860 > 1.7589, there is no positive autocorrelation. When detecting negative autocorrelation, it is known as (4 – dw) > dU, 2.14 > 1.7589. So, there is no negative autocorrelation

BOPO Dependent Variable Autocorrelation Test Results Table

Model Summary [b]					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,606 [a]	,367	,341	,097817	1,968

Source: Processed SPSS

There is no positive autocorrelation based on the SPSS output above, DW> Du, 1.968 > 1.7589. The detection results do not have a negative autocorrelation because (4 – dw) > dU, 2.14 > 1.7589.

Hypothesis test

1. T-Test Results (Partial) Dependent Variable NIM

From the output of SPSS, a test will be conducted to determine whether the IBANK D_1, SIZE X_2, CAR X_3, NPL X_4 variables partially affect the NIM variable (Y_1).

Table of T-Test Results (Partial) Dependent Variable NIM

Coefficients [a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std.	Beta		

			Error			
1	(Constant)	,074	,023		3,229	,002
	IBANK D1	-,010	,004	-,265	-2,324	,022
	SIZE X2	,000	.001	-,039	-,349	,728
	CAR X3	-,019	,026	-,070	-,737	,463
	NPL X4	-,447	,221	-,205	-2.022	0.046

Source: SPSS Processed Data

Hypothesis 1: Effect of Internet Banking on NIM

Based on the SPSS output above, it is known that the value is t_{hing} 2.324 > t_{tabel}1.98498 and the value of Sig. 0.022 < probability 0.05, it can be concluded that H1 or the first hypothesis is accepted. This means that there is a significant effect of IBANK D_1 on NIM(Y_1).

Hypothesis 2: Effect of Size on NIM

Based on the SPSS output above, it is known that the value of $t_{hi}ngs$ 0.349 < t_{tabel}198498 and the value of Sig. 0.728 > 0.05, then it can be concluded that H2 is rejected. This means that there is no significant effect of SIZE X_2 on NIM(Y_1).

Hypothesis 3: Effect of CAR on NIM

Based on the SPSS output above, it is known that the value is t_{hing} 0.737 < t_{tabel}198498; it can be concluded that H3 is rejected. This means that there is no significant effect of CAR X_3 on NIM(Y_1).

Hypothesis 4: Effect of NPL on NIM

Based on the SPSS output above, it is known that the value is 2.022 $t \quad value$ > t_{tabel} 1.98498 and Sig. 0.046 > 0.05, then it can be concluded that H4 is accepted. This means that there is an effect of NPL X_4 on NIM (Y_1).

2. T-Test Results (Partial) Dependent Variable BOPO

From the output of SPSS, a test will be conducted to determine whether the variables IBANK D_1, SIZE X_2, CAR X_3, NPL X_4 partially affect the BOPO variable (Y_2).

Table of T-Test Results (Partial) Dependent Variable BOPO

Coefficients [a]				
Model	Unstandardized Coefficients	Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
1	(Constant)	1,276	,147		8,668	,000
	IBANK D1	,132	0.027	,481	4,878	,000
	SIZE X2	-,027	,008	-,338	-3,476	.001
	CAR X3	-,424	,166	-,210	-2.552	0.012
	NPL X4	4,160	1,426	,255	2,916	,004

Source: SPSS Processed Data

Hypothesis 5: The Effect of Internet Banking on BOPO

Based on the SPSS output above, it is known that the value of the IBANK variable variableD_1 t_{hing} 4.878 > t_{able} 1.98498 and the value of Sig. 0.000 <0.05, it can be concluded that H1 or the first hypothesis is accepted. This means that IBANK affects D1 on BOPO (Y_2).

Hypothesis 6: Effect of Size on BOPO

Based on the SPSS output above, it is known that the value is t $value$ 3.476 > t_{tabel} 1.98498 and Sig. 0.001 < 0.05 probability, it can be concluded that H2 is accepted. This means there is an effect of Size on BOPO (Y_2).

Hypothesis 7: Effect of CAR on BOPO

Based on the SPSS output above, it is known that the value of $t_{hi}ngs$ 2.552 > t_{tabel}198498 and the value of Sig. 0.012 < 0.05, then it can be concluded that H3 is accepted. This means that there is an effect of CAR X_3 on BOPO (Y_2).

Hypothesis 8: Effect of NPL on BOPO

Based on the SPSS output above, it is known that the value is t $value$ 2.916 > t_{tabel} 1.98498 and Sig. 0.004 < 0.05 probability, it can be concluded that H4 is accepted. This means that there is an effect of NPL X_4 on BOPO (Y_2).

F Test (Simultaneous)

1. F Test (Simultaneous) Dependent Variable NIM

Table of F Test Results (Simultaneous) Dependent Variable NIM

ANOVA [a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,004	4	.001	4,311	,003 [b]

	Residual	,022	96	,000		
	Total	,026	100			

Source: Processed SPSS

Based on the SPSS output table above, it is known that the value of Sig. is 0.003. Because of the value of Sig. 0.003 < 0.05, then according to the basis of decision making in the F test, it can be concluded that the hypothesis is accepted or, in other words, IBANK D_1, SIZE X_2, CAR X_3, NPL X_4, simultaneously affect the NIM (Y_1).

Because the value $of\ F$ 4.311 > F_{tabel} 2.70, then as the basis for decision making in the F test, it can be concluded that the hypothesis is accepted or with IBANK D_1, SIZE X_2, CAR X_3, NPLX_4 simultaneously affect the NIM (Y_1).

2. F Test (Simultaneous) Dependent Variable BOPO

Table of F Test Results (Simultaneous) Dependent Variable BOPO

ANOVA [a]						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	,533	4	,133	13.935	,000 [b]
	Residual	,919	96	,010		
	Total	1,452	100			

Source: Processed SPSS

Based on the SPSS output table above, it is known that the value of Sig. is 0.000. Because of the value of Sig. 0.000 < 0.05, then according to the basis of decision making in the F test, it can be concluded that the hypothesis is accepted or, in other words, IBANK D_1, SIZE X_2, CAR X_3, NPLX_4 simultaneously affect the BOPO (Y_2).

Because the value $of\ F\ is$ 13.935 > F_{tabel} 2.70, then as the basis for decision making in the F test, it can be concluded that the hypothesis is accepted or with IBANK D_1, SIZE X_2, CAR X_3, NPLX_4 simultaneously affect the BOPO (Y_2).

R^2 Determination Test

Table of Determination Test Results for Variable NIM

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate

1	,390 [a]	,152	,117	,015146

Source: Processed SPSS

Based on the SPSS output table above, it is known that the coefficient of determination or R Square is 0.152. The magnitude of the coefficient of determination (R Square) is 0.152 or equal to 15.2%. This figure means that IBANK D_1, SIZE X_2, CAR X_3, and NPLX_4 simultaneously (together) affect the variable NIM Y1 by 15.2%. In comparison, the rest (100% - 15.2% = 84.8%) is influenced by other variables outside this regression equation or variables not examined.

Table of BOPO Dependent Variable Determination Test Results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	,606 [a]	,367	,341	,097817

Source: Processed SPSS

Based on the SPSS output table above, it is known that the coefficient of determination or R Square is 0.367. The magnitude of the coefficient of determination (R Square) is 0.367, or equal to 36.7 %. This figure means that the variables IBANK D_1, SIZE X_2, CAR X_3, and NPLX_4 simultaneously (together) affect the BOPO Y2 variable by 51.2 %. In contrast, the rest (100% - 36.7 % = 63.3%) is influenced by other variables outside this regression equation or unexamined variables.

DISCUSSION

1. Effect of Internet Banking on *Net Interest Margin* (NIM)

The development of the banking world is currently running very rapidly, and the conditions of the COVID-19 pandemic have also accelerated banking digitalization. Many customers need efficient and fast facilities from the banking sector.

The results showed that the first hypothesis was accepted. This means that there is a significant influence of Internet Banking on NIM. Banks that use Internet banking have a lower NIM than those that do not. This means that Internet banking has a negative effect on the bank's NIM. This is in line with research conducted by Yang (2018), DeYoung (2001), and Sullivan (2000).

The results of research by Sullivan (2000) in Yang (2018) explain that multichannel banks tend to increase non-interest expenses compared to non-internet banks. That is, internet banks need to improve on profits.

Based on research, internet banking has not been able to contribute to bank NIMs during the pandemic, even though internet users are increasing. The condition of declining NIM during the pandemic is unavoidable. Banks slow down lending, which has an impact on interest income. At the same time, it is impossible to reduce the interest expense on deposit funds that customers must pay to maintain adequate liquidity.

People's purchasing power is decreasing again, limiting economic activity to suppress the coronavirus. As a result, many business actors need to apply for credit from banks. This condition impacted the performance of bank lending, which of course, began to erode the NIM of the bank itself. The banking industry has kept up its pace with lending, resulting in low national economic growth. The problem is that the current *demand* for bank credit withdrawals could be higher for business players. (Kiryanto, 2020).

2. The Effect of Internet Banking on Operational Costs and Operating Income (BOPO)

Based on the study results, banks that use Internet Banking have a large BOPO compared to banks that have not used Internet Banking services. This means that Internet banking makes BOPO inefficient during the COVID-19 pandemic. The results of the study are in accordance with research by Angelakopoulos & Mihiotis (2011). They explained that banks need to spend time and money promoting e-banking services to attract customers. In addition, banks need to train staff responsible for the operation of e-banking channels. Compared to regular staff, members in the e-banking department must have a strong technology background. However, banks may face challenges recruiting talented people and increasing staff training costs. In addition, one study emphasized that banks should spend money on e-banking systems and infrastructure. Not only the initial costs used to design and build the e-banking system but also the costs involved in maintaining and updating the system and software.

The high growth of digital transactions worldwide, the COVID-19 pandemic that drives digital acceleration, and changes in people's consumption patterns toward digital, have forced banks to accelerate the transformation process towards digital banking inevitably. The shift to digital transactions of banks in Indonesia has not contributed to BOPO making it more efficient during the COVID-19 pandemic.

To obtain funds, banks must incur higher operating costs. This large operational cost is spent to offer many facilities to customers so they stay connected to other banks. This is also an effort to maintain liquidity. The increase in BOPO is even greater when interest rates tend to fall because banks have to offer more facilities to retain their customers (Abdullah, 2020). Conventional banks that provide digital services can only provide some of their services

digitally. In addition, conventional banks are identical, with a very large number of branch offices (Syafri, 2021).

3. Effect of Company Size on *Net Interest Margin* (NIM)

The results of this study have no significant effect of size on NIM during the COVID-19 pandemic. The larger bank size does not necessarily increase the interest income that will be obtained. The larger bank size is a constraint to interest and profit margins. The tendency to increase the level of economies of scale causes an increase in costs and tends to reduce profits (Arif, 2018).

According to OJK expert staff Ryan Kirynto, the banking industry is aware that in conditions such as the current COVID-19 pandemic, maintaining asset quality is more important than boosting NIM and net profit (Kiryanto, 2020).

Although not significant, the value of the regression coefficient shows a unidirectional positive effect between the SIZE and NIM variables. Banks with large sizes will get a large income from the point of view of credit distribution because these banks provide a large portion of the credit. The higher the market power of a bank indicates the degree of monopoly of the banking industry. Therefore, banks with large market power will set high margins with high loans and low deposit interest.

4. The Effect of Company Size on Operating Costs and Operating Income (BOPO)

The results of the study show there is an effect of size on BOPO. The regression coefficient value shows a negative effect in the opposite direction between the SIZE and BOPO variables. The result of the research shows that the negative direction means that the larger the size of the bank, the better the bank's efficiency. Thus, banks that have large total assets are better able to survive in the COVID-19 pandemic situation.

It is hoped that the positive relationship arising from larger banks is better able to develop technical, financial, human, and material resources in increasing efficiency. Bigger banks also get more customers for mobilizing funds and providing loans during the COVID-19 pandemic.

In line with research conducted by Jiménez (2019) showing that increasing bank size makes banks more efficient, lending and credit also increase efficiency, and inadequate credit risk management involves relatively higher consumption of inputs.

5. Effect of CAR on *Net Interest Margin* (NIM)

The results showed no significant effect of CAR on NIM during the pandemic. CAR has not contributed to NIM during the COVID-19 pandemic. Banks must utilize and allocate their capital properly to avoid affecting NIM.

The Financial Services Authority (OJK) estimates that banking profits by the end of the year will shrink by around 30-40% compared to last year. The decline in banking profits has been seen in the second quarter of 2020. From April to June 2020, bank profits before tax decreased by 19.8% from last year (Ananda, 2021). So that CAR has not had a positive effect on NIM. Meanwhile, in 2020, banking NIMs have also been eroded considerably due to the pressures faced during the COVID-19 pandemic and the increasing burden that must be borne.

6. Effect of CAR on Operating Costs and Operating Income (BOPO)

The results showed that CAR had an inversely proportional effect on BOPO. This is in line with research by Perwitaningtyas & Pangestuti (2015), which found a significant negative effect on the CAR ratio on efficiency.

Behind the resilience of the banking sector in general in Indonesia, however, not all banks have the same resilience amid the COVID-19 outbreak. The resilience of individual internal banks with small and non-systemic assets and banks with poor governance will be vulnerable to being vulnerable in the face of the current situation. On the capital side, banks with limited assets do not have a large capital, while from the Third Party Funds ratio (TPF), small banks only focus on a few depositors. As a result, liquidity risk occurs due to a decrease in the ratio of deposits and cash inflows to individual banks, where liquidity risk may increase during the Ananda pandemic (2021).

Banks in Indonesia still rely a lot on banking operating income from lending, so the dependence on third-party funds is very large. Banking during the COVID-19 pandemic is expected to maintain capital. Because the function of CAR itself is none other than to overcome the possible risk of loss while at the same time maintaining the stability of the company, this means that, in general, the greater the CAR value of the banking system, the better the banks' ability in terms of security and fulfillment of their obligations.

7. Effect of NPL on *Net Interest Margin* (NIM)

The results of the study found that NPL had an effect on NIM. The NIM ratio is inversely proportional to the NPL ratio. The regression coefficient value for the NPL variable has a negative value.

In August 2021, the NPL figure rose to 3.35% compared to the previous month. The increase in NPL is due to increased interest arrears, resulting in decreased interest income and the Capital Adequacy Ratio (CAR) (Darmawan, 2022).

Banks with a high NPL ratio will cause costs to swell (both the cost of reserves for productive assets and other costs), which will disrupt the performance of a bank and reflect the poor quality of a bank's credit, which will cause the bank to find it difficult to disburse credit.

The drop in profits was due to the large number of credit restructurings due to Covid-19. Based on OJK data, the level of non-performing loans in banks increased by 3.22%. This figure is up from the position in June, which reached 3.1%. Despite the decline in profits and an increase in bad loans, OJK data shows that Indonesia's banking liquidity is sufficient to be able to channel loans to support economic growth (Ananda, 2021)

The Financial Services Authority (OJK) stated that the impact of the COVID-19 pandemic had put pressure on banking profitability. The downward trend in interest rates and credit *demand* caused the banking NIM to fall. The decrease in NIM was due to a decrease in the debtor's ability to pay to meet its obligations, especially for debtors affected by the Covid-19 pandemic. Thus, maintaining the quality of non-performing loans (NPL) or the ratio of non-performing loans through credit restructuring is a top priority (Kiryanto, 2020).

8. Effect of NPL on Operating Costs and Operating Income (BOPO)

Based on the results of the study, it is known that there is an effect of NPL on BOPO. The regression coefficient value for the NPL variable has a positive and significant value. The positive influence of NPL on BOPO can occur because the higher credit risk will cause the costs associated with non-performing loans to increase; on the other hand, there is a decrease in income from non-performing loans.

Fungacova (2011) explains that with reduced bank income from the credit side and the increase in the cost of funds from savings in direct costs, the bank's profit margin has decreased, impacting efficiency.

One of the criteria for a bank to have potential difficulties that endanger its business continuity is if the net NPL percentage is more than 5% of total loans. Since the implementation of the PSBB, the NPL chart has continued to improve; in April 2020, the NPL ratio was at 2.89%, an increase of 0.36% compared to the previous period. Then in July 2020, the NPL ratio increased again to 3.22% (the highest number for the last six months), whereas in comparison, in the same period in July 2019, the NPL figure was only 2.55% (Darmawan, 2022).

Implementing a bad credit policy puts banks in a difficult position. Banks, as creditors, are entitled to receive credit and interest back from debtors. However, the economic conditions due to the COVID-19 pandemic have resulted in the majority of businesses experiencing cash flow difficulties, and not even a few debtors have had to stop their business activities which ultimately have an impact on credit repayment. If it is increasingly difficult for customers to pay their obligations to banks, this may impact higher non-performing loans and cause NPLs to increase.

During the pandemic, the banking sector must have good resilience to support government programs to increase economic growth. The main key that needs to be maintained by every bank is liquidity and lending. Given the emphasis on government programs to encourage household consumption, the role of banks in encouraging the real sector is increasingly real and crucial, Ananda (2021).

CONCLUSIONS

The results showed that *internet banking* had a significant negative effect on NIM, and *internet banking* had a significant positive effect on BOPO. Another variable is that size has no effect on NIM and has a significant negative effect on BOPO. CAR does not affect NIM and has a significant negative effect on BOPO. Meanwhile, NPL has a significant negative effect on NIM and a significant positive effect on BOPO. The factor that has the biggest influence on NIM is NPL. Meanwhile, the factors that influence the BOPO more are CAR and NPL. Banks are expected to pay more attention to the level of capital adequacy, credit risk, and total assets to increase bank profitability and efficiency going forward in facing the pandemic.

The suggestions that researchers can give to banks and further research are for bank managers to be expected in managing NIM considering the factors that significantly affect NIM in this study, namely NPL. At the same time, the factors that affect the more efficient BOPO are CAR and company size. A large BOPO puts pressure on bank interest income, namely NIM. Banks are expected to pay more attention to the level of capital adequacy and total assets to increase profitability and bank efficiency in the future in dealing with the pandemic.

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