Advanced International Journal of Business, Entrepreneurship and SME's
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

ADVANCED INTERNATIONAL JOURNAL OF BUSINESS, ENTREPRENEURSHIP AND SMES (AIJBES)
www.aijbes.com

ARE BANKING INDUSTRY MORE RESILIENT AGAINST THE COVID-19 PANDEMIC IN INDONESIA?

Radia Purbayati[1*], Agil Krisna Rivanda[2], Kurnia Fajar Afgani[3], Rosma Pakpahan[4]

[1] Department of Accounting, Politeknik Negeri Bandung, Indonesia
Email: radia@polban.ac.id
[2] Department of Accounting, Politeknik Negeri Bandung, Indonesia
Email: akraagil@gmail.com
[3] School of Business and Management, Institut Teknologi Bandung, Indonesia
Email: kurnia.fajar@sbm-itb.ac.id
[4] Department of Accounting, Politeknik Negeri Bandung, Indonesia
Email: rosma.pakpahan@polban.ac.id
[*] Corresponding Author

Article Info:

Article history:
Received date: 12.12.2021
Revised date: 31.12.2021
Accepted date: 10.02.2022
Published date: 01.03.2022

To cite this document:

Purbayati, R., Rivanda, A. K., Afgani, K. F, Pakpahan, R (2022). Are Banking Industry More Resilient Against The Covid-19 Pandemic In Indonesia?. *Advanced International Journal of Business, Entrepreneurship and SMEs*, *4* (11), 23-41.

DOI: 10.35631/AIJBES.411003.

Abstract:

This research aims to examine the resilience of the banking industry due to Covid-19. The study focuses on Commercial Banks in Indonesia along January 2017 to April 2021. The study uses a descriptive analysis method of the banking industry in Indonesia with the variables tested including ROA, CAR, LDR, NPL, NIM and BOPO using VAR/VECM analysis. The results show that VECM modelling at the 2nd lag optimum is used at this analysis. Variables that significantly affect banking performance in the short and long run are CAR, LDR, NPL, NIM, BOPO and ROA at 1st lag, but at 2nd lag the LDR variable has no significant effect on ROA in the short run. The shock caused by the variables CAR, LDR, NPL, NIM, BOPO and ROA itself is responded by ROA through the Impulse Response Function and will be corrected to ease moving towards early equilibrium (conditions before the Covid-19 pandemic) within a period of time recovery between 5 months to 30 months. Even though the banking industry is contracting and inefficiency has occurred due to the Covid-19 pandemic, the resilience of the banking industry is still maintained and under control due to the implementation of various stimulus policies issued by the OJK to mitigate banking risks during the Covid-19 pandemic which has the potential issues to financial distress.

Keywords:

Business Resilience, Banking Industry, Covid-19, VAR/VECM

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Introduction

Covid-19 pandemic had an impact on global economy (Afgani, Rivanda, & Purbayati, 2021), (Elnahass, Trinh, & Li, 2021b). It has impacted financial and banking performance on various indicators of financial performance and financial stability in various countries as well as deteriorating resilience conditions (Duan, Ghoul, Guedhami, Li, & Li, 2021), (Demirgüç-kunt, Pedraza, & Ruiz-ortega, 2021). The pandemic has increased the systemic risk in many countries (Demirgüç-kunt et al., 2021).

In order to mitigate these risks, various recovery policies interventions were taken by the government (Ghosh & Saima, 2021), (Elnahass, Trinh, & Li, 2021a), (Tan et al., 2021). Banking performance has decreased during the Covid-19 pandemic (Demirgüç-kunt et al., 2021). The resilience of banking has deteriorated in managing the shock of the Covid-19 Pandemic (Joko, Bagas, & Ikhwan, 2020). In Indonesia, the banking intermediation function was held back due to weak credit with credit growth declining from 7.89% to 0.12% despite an increase in Third Party Fund (TPF) growth from 7.47% to 12.88%, Return on Assets (RoA) declining from 2.45% to 1.74%, Net Interest Margin (NIM) decreased from 4.79% to 4.29%, the ratio of Operating Expenses to Operating Income (BOPO) increased from 80.66% to 86.15%, Loan to Deposit Ratio (LDR) decreased from 93.76% to 83.16%, Non Performing Loans (NPL) increased from 2.66% to 3.14% (Park & Shin, 2021).

This study aims to analyze what indicators affect the performance of the banking industry during the Covid-19 pandemic in the short and long run, analyze the ROA response to the shock of financial indicators caused by the Covid-19 pandemic. 19, analyzing how long it will take to predict time recovery for every single financial indicators due to the Covid-19 pandemic, reviewing the resilience of the banking industry during the Covid-19 pandemic. The contribution of this research can be used as an early warning system for the shock that have the potential to the systemic impact during Covid-19 pandemic. Based on this study, banks can make decisions on how to set the strategies when facing the Covid-19 pandemic, which it is not known when it will end.

Poor asset management could have been expected as a result of excessive investment and lending by commercial banks have undertaken initiated during the boom period leading up to the crisis would have generated less profitability (ROA) and efficiency (income/assets) performance than Islamic BanksResearch (Salih, Ghecham, & Al-Barghouthi, 2019). The measurement of internal banking performance is reflected in the realization of a bank's profitability (Masdupi & Defri, 2012). The ratio of profitability was measured by ROA (Sunarya, 2017). The factors that have a positive influence to profitability (ROA) for commercial banks are BI Rate, NPL, inflation, and loan to deposit ratio(Suwarsi & Azib, 2017).

Literature Review

There are nine points that are discussed in the following literature review.

Covid-19 Pandemic and Global Economy

Corona Virus Disease (Covid) – 19 is a virus that causes a disease with symptoms of fever, cough, moderate to mild respiratory problems such as flu or respiratory tract and lung infections, and has the potential to experience multi-organ disorders. This virus can mutate into several types or new variants. The Covid-19 pandemic that has occurred has caused 32

Advanced International Journal of Business, Entrepreneurship and SME's
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

countries to experience recession due to contracted economic growth in the first quarter and second quarter of 2020, the worst was Macau with negative economic growth of -67.8% followed by Peru -30.2%, India -23.9%, Spain - 22.1, Malaysia -17.1%, Singapore -13.2% (OJK, 2020). In early 2021, the global economy began to show a recovery, supported by the speed of the economic recovery process in various countries, influenced by the ability to enforce health protocols to extraordinary fiscal and monetary policies issued by each country (OJK, 2021).

Various countries intervened through stimulus policies in the context of national economic recovery such as monetary policies (lowering/maintaining interest rate; liquidity injection and Quantitative Easing (QE) through purchasing government bonds, reducing Reserve Requirements (GWM); and the Pandemic Emergency Purchase Program) as well as fiscal policy stimulus (increase in the health budget; increase and expansion of social safety nets, tax relaxation; subsidy programs for corporations and budget preparation for economic recovery programs) to encourage consumption and investment. The following are examples of some countries that have implemented policy stimulus:

1) Accommodative Monetary Policy
   - The FED maintains the Fed Funds Rate at the level of 05-0.25% (purchase of securities in the form of Treasury Securities and Mortgage Based Securities until the inflation target is reached),
   - The European Central Bank (ECB) purchases assets through the Pandemic Emergency Purchase Program, carries out refinancing operations through Targeted Longer-Term Refinancing Operations, and maintains interest rates at low levels.
   - The People's Bank of China maintains its Medium-Term Lending Facility policy of 2.95%, 7-Days Repo Rate of 2.2% and the benchmark Loan Prime Rate of 3.85%.
   - The Bank of Japan imposed a negative interest rate of -0.1% for short-term interest rates and kept long-term rates at 0%.
2) Expansionary Fiscal Policy
   - The United States government adds to the fiscal stimulus of the American Rescue Plan aimed at boosting consumption.
   - In China, the central government increased the transfer of funds to surrounding areas and continued the implementation of the tax reduction policy.
   - In Europe, the European Union (EU) approved recovery funds and a multi-year budget for financing recovery and promoting digital modernization and addressing climate change.
   - The Japanese government increased the 2021 budget from the realization in 2020.

Covid-19 Pandemic and Indonesian Economy

During the pandemic, Indonesian economy contracted significantly with the economic growth rate in the second quarter of 2020 reaching negative -5.3% (OJK, 2020). The rate of economic growth only depends on the trade balance surplus where the decrease in imports was greater than the decrease in exports. The decline in imports decreased by -16.96% (yoy), while the export rate contracted by -11.66%. Investment contracted by -8.61% (yoy), consumption decreased by -5.57% (yoy) and government spending decreased by -6.90% (yoy).

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

In order to recover the Indonesian economy due to the Covid-19 Pandemic, various monetary and fiscal stimulus policies were carried out by the government through PERPU 01/2020 on March 31, 2020 concerning State Financial Policy and Financial System Stability for Handling the Covid-19 Pandemic and or in Facing Threats. Which is Dangerous to the National Economy and/or Financial System. Follow-up in anticipating the impact of the Covid-19 pandemic in order to maintain financial system stability (Kemenlu, 2020). On the monetary policy side, Bank Indonesia lowered the BI-7 Days Repo Rate by 25 basis points to 3.5% and continued to purchase securities on the primary market in order to recover the domestic economy, while on the fiscal policy side, the Government of Indonesia carried out the National Economic Recovery Program.

Covid-19 Pandemic and Impact on Banking in Indonesia

The banking sector in Indonesia has suffered from the impact of the Covid-19 pandemic since the second quarter of 2020, which was caused more by credit problems than from liquidity problems (Habir & Wardana, 2020). Credit growth slower than growth in deposits, LDR, ROA and CAR have been decreased while NIM and NPL increased (OJK, 2020).

Studies related to the impact of the Covid-19 pandemic on banking stability have been carried out in several countries as summarized in the following table.

Table 1: Previous Research

Researcher	Years	Purpose	Method	Variable	Result
Barua, Barua.	2020	Examines the possible impact of the pandemic on the Bangladeshi nation's banking sector.	Stress Testing Model	Firm Value, Capital Adequacy, dan Interest Income, NPL.	A 10% NPL shock can force the capital adequacy of all banks to be below the minimum BASELIII requirement, while a shock of 13% or more can turn it into zero or negative at sectoral level (Barua & Barua, 2021)
Elnahass, Trinh, Li	2020	Assessing the impact of the pandemic on global banking stability and to assess potential recovery signals.	Data panel regression of 1,090 banks from 116 countries for the quarterly period 2019-2020	ROA, ROE, ROAA, ROAE, Cost to Income (Cost/Income)	The Covid-19 outbreak has adversely affected financial performance across various financial performance indicators (i.e., accounting-based and market-based performance measurement) and financial stability (i.e., high-risk indicators including default risk, liquidity risk and asset risk).
Johan	2020	Assessing the effect of credit relaxation on financial and banking industry	Qualitative research using primary data supported by secondary data.	Credit relaxation in the hospitality, culinary, travel and automotive industries.	Credit relaxation policies cannot be applied nationally and cannot generalize to all customers. The government should focus on macro and overall policies. Sectoral policies left to industry and controlled by the relevant authorities.
Ghosh dan	2021	Analyze and	Multiple	Capital	Based on performance scores using

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Saima		forecast financial sustainability and resilience Bangladeshi commercial banks in response to the effects of the COVID-19 pandemic.	Criteria Decision Making (MCDM) methods, namely TOPSIS and HELLWIG against 18 Commercial Banks listed on the Dhaka Stock Exchange	Adequacy, Liquidity Ratio, Profitability, Non-Performing Loans and Resilience Capacity to Adverse Effects of the COVID-19 pandemic	the TOPSIS and HELLWIG methods, banks are categorized into three groups (six banks each), namely top resilient, moderate resilient and low resilient. It was found that EBL and DBBL were the most resilient banks, and ONEBANK was the worst resilient bank in Bangladesh in managing the shock of the COVID-19 pandemic.
Hsuan-Chi Chena,1,*, Chia-Wei Yehb	2020	Studying the crisis reaction to the global financial crisis of 2008 and the COVID-19 pandemic in the US.	Using St. Louis Fed Financial Stress Index (STLFSI2) to measure the level of financial stress on the market	The daily abnormal return and the CRSP value-weighted market index return.	Qualitative easing is effective in increasing investor confidence. The effect of quantitative easing in 2020 on stock performance is more significant for industries that are more affected by the pandemic.
Fakhri, U.N., dan Darmawan, A	2021	Knowing the financial performance factors affected by the Covid-19 pandemic in Islamic and conventional banking in Indonesia.	Artificial Neural Network (ANN) Method	Capital Adequacy Ratio, Operating Expenses/Operating Income, Net Operating Margin, Landing on Deposit Ratio, Short Term Mismatch	The Covid-19 pandemic has affected the financial performance of Islamic banking, which is more vulnerable than conventional banking in facing a financial crisis.

Source: Processed, Data retrieved.

Based on a review of previous research that has been carried out in several countries by previous researchers, this study adopted several variables as proxies for banking stability and then developed it again by adding several variables that had not been studied in previous studies, so that the following hypothesis could be formed:

Return on Assets (ROA)

ROA is a ratio used to measure banks' overall profitability (Kalisman & Febrian, 2019). ROA is used to assess how effectively a bank's business in using its resources. Profit obtained

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

from earning before tax obtained by a bank is the net profit derived from operational activities which makes pre-tax returns. Total asset is the average volume of business or assets over the past twelve months.

Capital Adequacy Ratio (CAR)

CAR is a comparison between capital and risk-weighted assets. The greater the CAR value, the better the ability of banks to deal with the possible risk of loss. The higher the CAR value indicates the better the banking performance and the potential to increase the bank's profit level, because the lower the risk of the bank's capital allocation to its assets.

H1: The shock in CAR positively influences ROA during the Covid-19 pandemic.

Loan to Deposit Ratio (LDR)

LDR is the ratio of the number of credits to the total funds received. LDR is an indicator of a bank's liquidity. The higher the LDR indicates the greater the loan disbursement to the amount of funds received. So that the potential to generate profits from lending is higher**.**

H2: The shock in LDR positively influences ROA during the Covid-19 pandemic.

Non Performing Loan (NPL)

NPL is the ratio between the number of loans granted and the collectibility level that is included in the non-performing category to the total loan. The higher the NPL value indicates the higher the number of non-performing loans so that it will reduce the Bank's profit level.

H3: That shock in NPL ROA negatively influences ROA during the Covid-19 pandemic.

Net Interest Margin (NIM)

The NIM ratio is the ratio between net interest income and bank earning assets. The higher the NIM, the higher the bank's performance in managing productive assets to generate interest income. The higher the NIM value, the better the bank's performance in generating profits.

H4: That the shock in NIM positively influences ROA during the Covid-19 pandemic.

Operating Expenses and Operating Income (BOPO)

BOPO is a ratio that compares operational costs with operating income. This ratio measures how much the bank's ability to manage its operating expenses. The greater the BOPO ratio indicates that the bank does not have the ability to manage its operating expenses so that efficiency is not achieved. This will have an impact on the potential for a declining in bank performance result from a decreasing in profits due to swelling operational costs.

H5: That shock in BOPO negatively influences ROA during the Covid-19 pandemic.

Methodology

This research uses quantitative descriptive analysis. The population in this study were all commercial banks registered with the OJK. The total population is 107 banks. This type of data uses quantitative secondary data. The study uses time series data base on bank performance indicators on average for the monthly period from January 2017 to April 2021. The data source is obtained from Otoritas Jasa Keuangan Indonesia (OJK). The following table describes the variables used in the study.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Table 2: Variable Operational Definition

Variable	Description
Dependent Variable	
ROA	Profitability ratio which measures the ability of a bank to generate profits from all its assets. This ratio is used to assess the quality of bank performance in generating net income from asset management.
Independent Variable	
CAR	A ratio that measures the bank's ability to provide funds that are used to overcome the possible risk of loss.
NIM	A ratio that measures a bank's ability to manage earning assets to generate net interest income. This ratio is an indicator of the bank's financial health. Ratio that compares net interest income with bank earning assets
NPL	Ratio that compares non-performing loans to total loans disbursed by banks.
LDR	A ratio that compares the amount of credit with the total funds received.
BOPO	The ratio that compares operating costs with operating income.

Source: Processed, Data retrieved.

VAR/VECM

Vector error correction model is a VAR model is restricted to nonstationary variable data which are known to have co integration or possible long-term impact. In general, the steps in using the model VAR/VECM starting with stationary test the data, and then test the length of inaction (lag) is optimal, stability testing VAR/VECM, Granger causality test and cointegration test, estimation of the VAR model, Impulse Response Function (IRF) and Forecast Error Variance Decompotition (FEDV). These steps can be described in the following figure 2.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

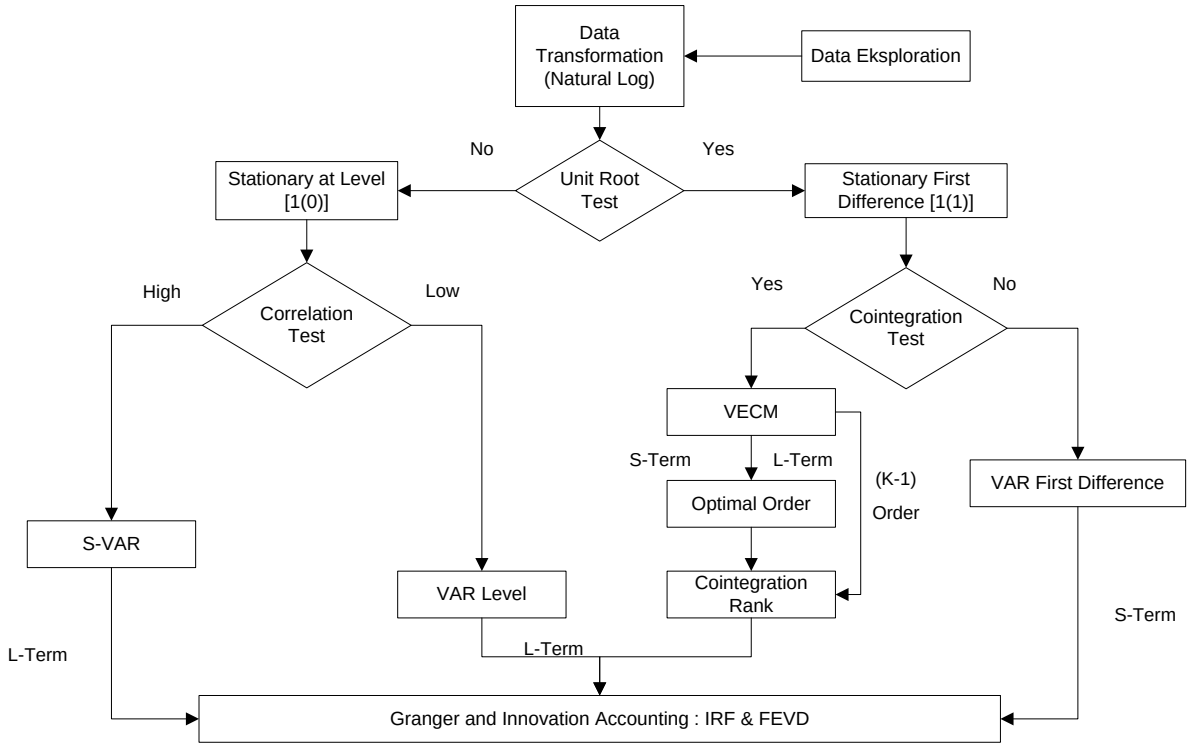

Figure 1: VAR Analysis Process

Source: Processed, Data retrieved.

The research uses the VAR/VECM analysis tool by testing the data stationarity first through the unit root test and cointegration test. The unit root test is based on the standard Augmented Dickey Fuller Test (ADF) procedure. If the data is stationary at the level level, then VAR analysis is used, but if the data is stationary at the 1st difference level, then using the VECM model. Cointegration test is used to see if there is a linear combination between non-stationary variables that are integrated at the same lag. If two time series variables x and y are not stationary, but their linear combination produces a new stationary variable, then x and y are said to be cointegrated. The test uses the Johansen procedure which is intended to obtain a stable long-term equation. The long-term relationship between two time series variables is modeled as follows:

$$y_t = \alpha_0 + \alpha_1 x_t + \varepsilon_t$$

where yt represents the dependent variable, xt represents the independent variable, and t is the disturbance term, α shows the level of change in the independent variable that has an impact on the change in the dependent variable. The long-term relationship is said to be perfect if 1 is equal to one, and it is said to be imperfect if the value of 1 is less than one (Elnahass et al., 2021a). If there are more than zero cointegration rank (the number of independent cointegration vectors), then the VECM method can be used. VECM has cover short-term information and long-term information because the equation contains short-term and long-term parameters with the following equation:

$$\Delta y_t = \beta_1 \Delta x_t - \beta_2 (y_{t-1} - a_0 - a_1 x_{t-1}) + v_t$$

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

where Δ indicates the first difference, β_1 indicates the short-term parameter, β_2 indicates the *error correction* parameter (the rate of error correction adjustment speed if the resulting value is far from the equilibrium condition), a_0 and a_1 are long-term parameters. The last step is to perform the *Impulse Response Function* (IRF) test to predict the recovery period required due to a *shock*.

Result

Unit Root Test

The Unit Root Test is used to see the stationary of the data on a time series variable. The initial test uses the Augmented Dickey Fuller (ADF) Unit Root Test parameter at the Level level. If the probability value is less than α (5 percent), it can be said that the variable is stationary at the level level, but if the probability value is greater than alpha, it is necessary to test at the 1st difference level. The following are the results of the unit root test.

Table 3: Unit Root Test

Variable	Level			1st Difference		
	ADF	Prob	Conclusion	ADF	Prob	Conclusion
ROA	-2.815036	0.0632	Not Stationary at Level	-12.14780	0.0000	Stationary at 1st Diff.
CAR	-2.129187	0.2345	Not Stationary at Level	-6.793017	0.0000	Stationary at 1st Diff.
NPL	-3.027845	0.0394	Not Stationary at Level	-10.70144	0.0000	Stationary at 1st Diff.
NIM	-1.412031	0.5693	Not Stationary at Level	-8.127195	0.0000	Stationary at 1st Diff.
LDR	1.008895	0.9961	Not Stationary at Level	-5.404517	0.0000	Stationary at 1st Diff.
BOPO	-2.439906	0.1362	Not Stationary at Level	-8.604272	0.0000	Stationary at 1st Diff.

Source: Processed Results of Unit Root Test, Data retrieved.

Table 3, show that only NPL is stationary at the level with a probability value of 0.0394 less than α (5 percent), while the other variables ROA, CAR, NIM, LDR and BOPO have a probability value at the level greater than than α (5 percent), so it can be that the time series variable is not stationary at the level. So further *unit root* testing is required at the *1st difference* level. The test turned out to produce a probability value of all variables smaller than alpha 5%. So it can be said that all of the variable data is stationary at the *1st difference*.

Lag Optimum Test

The next step is to test the Lag Test to see how long the variables will affect each other. The following table shows the results of the lag test to get the optimum lag.

Table 4: Lag *Optimum* Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-175.1757	NA	8.98e-05	7.709603	7.945792	7.798483
1	-155.4238	33.62014	0.000182	8.401015	10.05434	9.023172
2	**-112.4167**	**62.22305***	**0.000145***	**8.102840***	**11.17330***	**9.25827***
3	-92.45646	23.78246	0.000353	8.785381	13.27297	10.47409
4	-54.61569	35.42540	0.000506	8.707051	14.61178	10.92904

Source: Processed Results of Lag Optimum Test, Data retrieved.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Table 4, show results of the Lag Optimum test, show that the dominant number of asterisks(*) is at Lag 2. So that Lag 2 can be defined as Lag Optimum and used as the basis for analysis in the next stage. Variables are said to influence each other until the previous 2 periods.

Cointegration Test

Cointegration test is one of method to detect the long-run relationship between the independent variable and the dependent variable. This test looks at the extent of the relationship between economic variables in the long run equilibrium.

Table 5: Counteraction Test

Hypothesized No. of CE(s)	Eigenvalue	Statistic	0.05 Critical Value	Prob.**
SNone *	0.618714	114.2363	95.75366	0.0015
At most 1	0.424544	69.99020	66.81889	0.0823
Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
None *	0.618714	47.24610	40.07757	0.0066

Source: Processed Results of Cointegration Test, Data retrieved.

The cointegration test results show, that the trace statistic value is 114.23 greater than the critical value at α (5 percent) significance level 95.753 and the trace statistic value is 69.990 greater than the critical value at α (5 percent) significance level 66.818 and the trace statistic value is 114.236 greater than the Eigenvalue 0.618, and the Trace Statistic value of 69.990 is greater than the eigenvalue of 0.424. It can be concluded that at least there are two cointegration equations that can be formed. The cointegration test results using the maximum eigenvalue statistics show that the probability value of 0.0066 is less than α (5 percent) so that it can be concluded that there is a cointegration equation that occurs and the model estimation uses VECM.

VECM Model Estimation

In this estimation, ROA is the dependent variable, while CAR, NPL, NIM, LDR and BOPO are independent variables. The results of the VECM estimation in the short-run and long-run effects are shown in the following table. The factors that influence changes in ROA in the short run are listed in the following table:

Table 6: VECM Model Estimation (Short Run Effect)

Variable	Coefficient	t-Statistic
CointEq1	-0.009481	0.02892
D(CAR(-1))	-0.066118	-0.81194
D(CAR(-2))	0.011853	0.13305
D(NPL(-1))	-0.051808	0.03514
D(NPL(-2))	0.152269	0.15519
D(NIM(-1))	0.334707	0.43937
D(NIM(-2))	0.080105	0.42697
D(LDR(-1))	0.032894	0.92617
D(LDR(-2))	0.088473	2.13871
D(BOPO(-	-0.027105	-1.40384

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

1))		
D(BOPO(-2))	-0.031882	-1.78320
C	-0.009481	0.02892

Source: Processed Results of VECM Model Estimation (Short Term Effect), Data retrieved.

VECM model estimation show in the short run, there are all significant variables at the α (5 percent) significance level and 1 error correction variable in lag 1 with the t-statistic value smaller than the t-table value, but at lag 2 the LDR variable (-2) is not significant in influencing ROA. The optimum lag 2 obtained from the short-term VECM equation shows that changes that occur in the current ROA are affected not only by the current CAR, NPL, NIM, LDR and BOPO variables, but are also affected by these variables since the previous 2 months. Every change of 1% that occurs in each independent variable since the lag of the previous 2 months will affect the change in ROA in the current period by the value of each coefficient with the direction of change as marked on each coefficient. The existence of an alleged significant error correction parameter indicates that there is an adjustment mechanism from the short to the long run. The amount of adjustment from short to long run is -0.009481. The biggest influence on the changes that occur in ROA results from the shock of the NIM variable at Lag 1.

Table 7: VECM Model Estimation (Long Term Effect)

Variable	Coefficient	t-Statistic
CAR(-1)	1.633376	1.87734
NPL(-1)	-1.96394	0.92555
NIM(-1)	1.532002	0.73176
LDR(-1)	0.274971	1.71097
BOPO(-1)	-1.122737	0.92555

Source: Processed Results of VECM Model Estimation (Long Term Effect), Data retrieved.

VECM model estimation show in the long run, the CAR, NPL, NIM, LDR and BOPO variables have a significant effect on ROA (Fakhri, 2021). The existence of a significant effect of the CAR variable on ROA positively in the short run lags 1 and 2, and in the long run is in line with research conducted by (Elnahass et al., 2021a) and (Barua & Barua, 2021). The NIM and LDR variables have a significant positive effect on short-run ROA lags 1 and 2, but at lag 2 LDR has no significant effect on ROA, while in the long run NIM and LDR variables have a significant effect on ROA. This is in line with research conducted by (Elnahass et al., 2021a). Meanwhile, NPL has a significant and negative effect, and BOPO has a negative effect on ROA in accordance with research conducted by Barua, Barua 2021. An increase in the CAR, NIM and LDR variables of 1% will result in an increase in ROA of 1.633376%, 1.532002, and 0.27497. Meanwhile, the increase in the NPL and BOPO variables by 1%, respectively, will result in a decrease in ROA of 1.96394% and 1.122737 %. The biggest impact resulted from the NPL shock.

Impulse Response Function (IRF)Analysis

Impulse Response Function analysis explains the impact of the shock of one variable on other variables and how long the effect lasts. This analysis can see the long-run dynamic response of each variable if there is a certain shock of one standard error in each equation.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

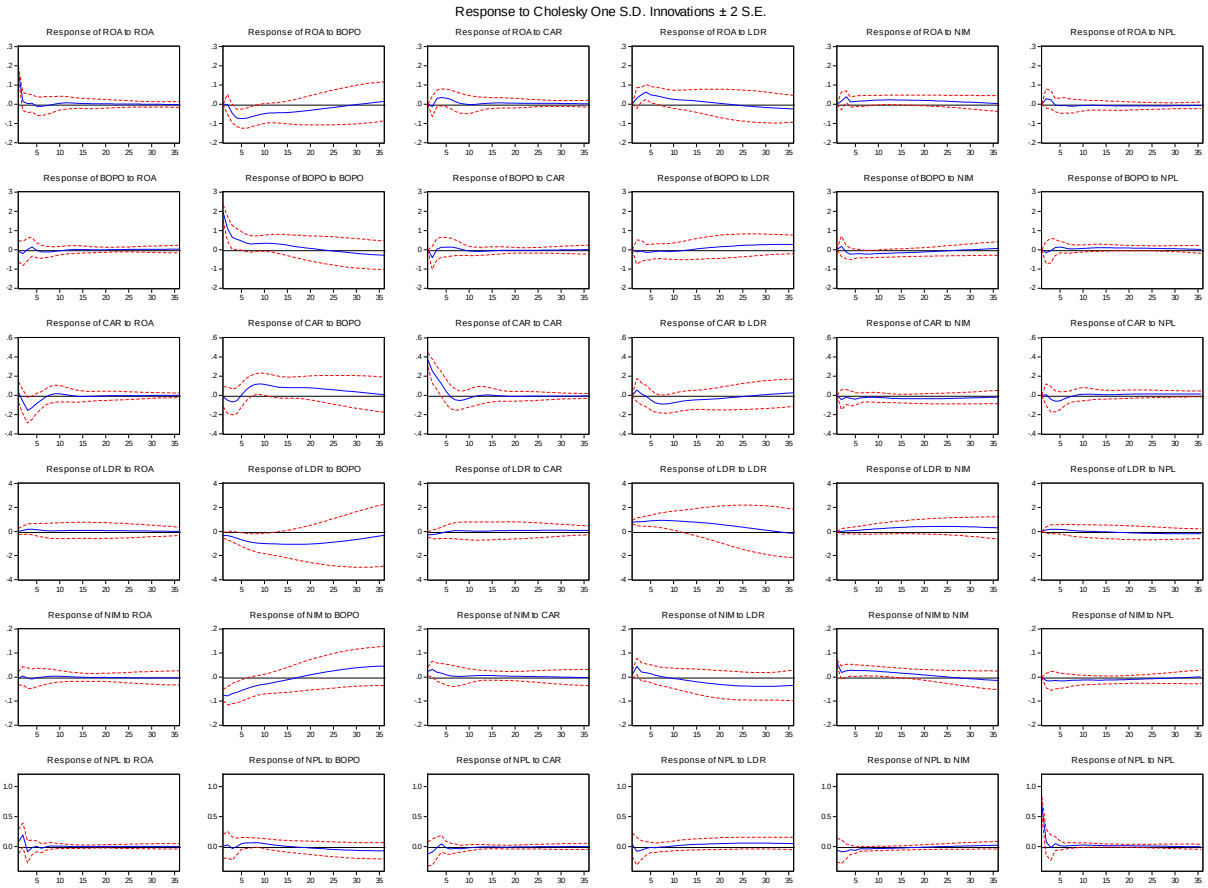

Figure 2: Impulse Response Function

Source: Processed Results of Impulse Response Function, Data retrieved.

ROA Response to The Shock in Banking Financial Indicators

The Shock of CAR

The shock of the CAR variable during the Covid-19 pandemic will be responded positively by the ROA. It is predicted that the shock will weaken and return to the early equilibrium in the 8th month with the assumption that there will be no 2nd wave of the Covid-19 pandemic after 1st wave which has been estimated in this study. The following figure shows CAR fluctuations.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

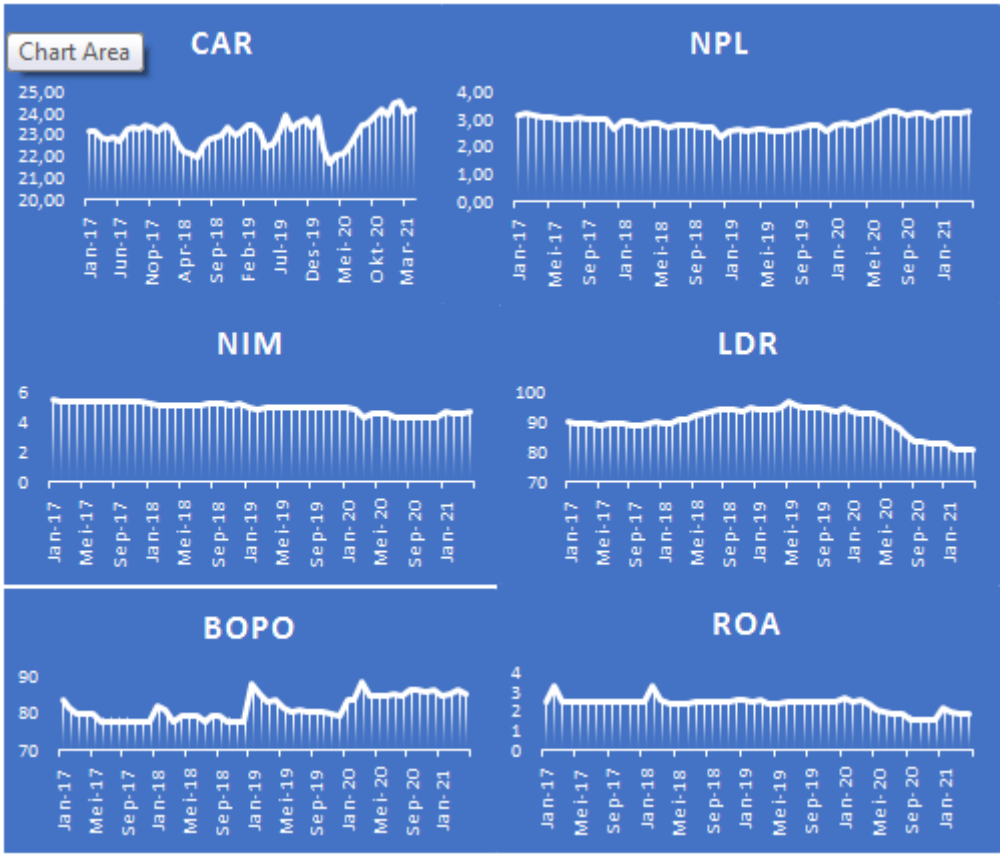

Figure 3: Financial Indicators for Conventional Commercial Banks

Source: Processed Results of Financial Indicators for Conventional Commercial Banks, Data retrieved.

During the research period, the CAR variable fluctuated. A significant decline occurred at the beginning of the Covid-19 pandemic in the first quarter due to increased credit risk, resulting in an increase in Risk Weighted Assets. This has an impact on the decline in banking CAR. Although there was a decline, this was immediately anticipated by the provision for additional banking capital through the Financial Services Authority Regulation POJK No. 11/POJK.03/2016 concerning Minimum Capital Adequacy Requirements for Commercial Banks. Commercial Banks are required to establish a CAR ranging from 8% to 14% based on the bank's rating based on risk profile.

Table 8: Commercial Bank CAR Provisions

Provisions for CAR	Rating based on Risk Profile
CAR = 8%	Rank 1
9% ≤ CAR < 10%	Rank 2
10% ≤ CAR < 11%	Rank 3
11% ≤ CAR = 14%	Rank 4

Source: Processed Results of Commercial Bank CAR Provisions, Data retrieved.

In addition, Commercial Banks are required to increase their capital as a buffer in the form of additional capital conservation buffer, countercyclical buffer, and capital surcharge. Additional Capital Requirements as a buffer are summarized in the following table:

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Table 9: Provisions for Bank Capital Increase

Types of Additional Capital	Definition	Application in Banks	Additional Amount
Capital Conservation Buffer	Additional capital that functions as a buffer in the event of a loss during a crisis period.	BUKU 3 and BUKU 4 bank groups	2.5% of ATMR
Countercyclical Buffer	Additional capital that serves as a buffer to anticipate losses in the event of excessive bank credit growth that disrupts financial system stability.	Entire Bank	0-2,5% of ATMR
Capital Surcharge	Additional capital that serves to reduce the negative impact on financial system stability and the economy in the event of a bank failure that has a systemic impact through increasing the ability of banks to absorb losses.	Banks with systemic impact	1-2.5% of ATMR

Source: Processed Results of Provisions for Bank Capital Increase, Data retrieved.

In order to anticipate the continued impact of the Covid-19 pandemic, OJK reaffirmed the rules for increasing the capital. POJK No. 48/POJK.03/2020 Regarding Amendments to POJK 11/POJK.03/2020 concerning National Economic Stimulus as a Countercyclical Policy for the Impact of the Spread of Corona Virus Disease 2019 regulates capital resilience considerations by taking into account additional reserves to anticipate the potential decline in the quality of restructuring loans in terms of distributing dividend. This POJK also regulates that Conventional Commercial Banks that are included in the BUKU 3 and 4 bank groups may not meet the capital conservation buffer of 2.5% of the RWA. In addition, OJK also issued POJK No. 18 / POJK.03/2020 dated April 20, 2020 regarding Written Orders for Handling Bank Problems. Financial policy for handling the covid-19 pandemic in order to face the threat of endangering the national economy / financial system stability. Banks may conduct mergers/consolidations/acquisitions to strengthen the bank's capital structure. With the implementation of these policies, even though banks are facing a tough situation during the Covid-19 pandemic, the resilience of Commercial Banks is still solid and maintained, seen from the high capital above the threshold of applicable regulations. So that the ability of Conventional Commercial Banks to cover losses is still high.

The Shock of NPL

The shock to the NPL was responded negatively by the ROA during the covid-19 pandemic. The shock is predicted to be corrected by the error correction starting from the 5th month period, assuming that only the waves of the Covid-19 pandemic that occurred were covered in the research period. Prior to entering the Covid-19 Pandemic period, NPL developments showed a downward trend which indicated that the quality of bank credit was getting better with the reduction in the number of non-performing loans reaching an NPL value below 3%. However, after entering the Covid-19 pandemic period, in April 2020 there was an increase in the NPL value until it reached its highest point in June and July 2020 and February 2021. Despite an increasing trend, the NPL value throughout the research period was still under control, below the threshold value se at α (5 percent). This is due to the establishment of CKPN to cover the increase in credit risk during the Covid-19 pandemic.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

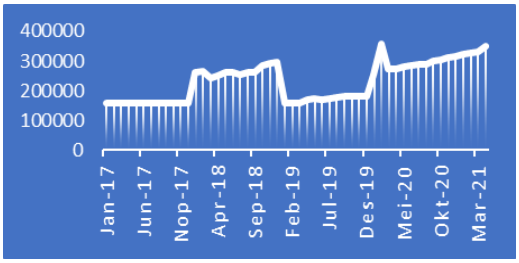

Figure 4: CKPN Performance for Conventional Commercial Banks

Source: Processed Results of CKPN Performance for Conventional Commercial Banks, Data retrieved.

A policy issued by the OJK in the form of POJK No. 11/POJK/03/2020 related to the national economic stimulus as a countercyclical policy due to the spread of the coronavirus disease. The background encourages the optimization of the banking intermediation function, maintains financial system stability and supports economic growth. This policy is valid from March 17, 2020 to March 31, 2021. Stimulus policies in the form of:

- Credit quality assessment is only based on the accuracy of principal and interest payments with a ceiling up to IDR 10 billion.
- Improved credit quality after restructuring, regardless of credit limit or type of debtor.
- How to restructure:
- Lower interest rates.
- Extension of time period.
- Reduction of principal arrears.
- Reduction of interest arrears.
- Addition of credit facilities.
- Convert credit into temporary equity participation

The policy was extended until March 31, 2022 based on POJK No. 48/POJK.03/2020 Regarding Amendments to POJK 11/POJK.03/2020 concerning National Economic Stimulus as a Countercyclical Policy Impact of the Spread of Corona Virus Disease 2019. This regulation was issued as an anticipatory and follow-up step to encourage optimization of banking performance, maintain the stability of financial system, and support economic growth while still applying the precautionary principle and avoiding the occurrence of moral hazard. This regulation requires banks to implement risk management including:

- Has guidelines to determine debtors affected by the spread of covid-19.
- Assessing debtors who are able to continue to survive and have business prospects so that they can be restructured according to the POJK.
- Establish reserves for debtors who are considered unable to survive after restructuring.
- Conduct periodic resilience tests against the potential decline in the quality of restructuring loans and their impact on bank liquidity and capital.

Along with the uncertainty of when the Covid-19 pandemic will end, it creates uncertainty in economic activities and business activities, so that banks continue to face the potential for increased credit risk arising from the following indications:

- High nominal NPL compared to the previous year,
- Increased credit ratios that experienced a decline in quality.
- Credit contraction due to sluggish economic activity as a result of the decline in credit demand during the Covid-19 pandemic.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

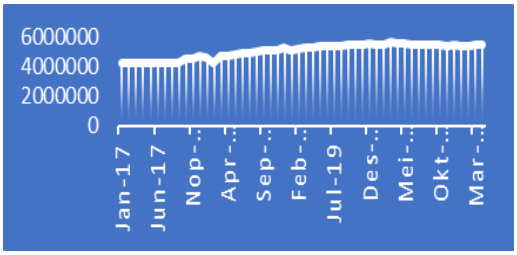

Figure 5: Performance Commercial Credit of Conventional Banks

Source: Processed Results of Performance Commercial Credit of Conventional Banks, Data retrieved.

The Shock of NIM

The shock on NIM will be responded by ROA positively. The shock was weak and quickly corrected stably moving towards equilibrium at 5th month. The situation will return to the early equilibrium as it was before the pandemic entered its 35th month, assuming the wave of the Covid-19 pandemic that occurred was only covered in the research period. Commercial Bank NIM experienced a downward trend and continued to decline during the Covid-19 pandemic period caused by an interest income contraction due to lower demand for credit. Despite the downward trend, the resilience of NIM is still maintained above the 4% threshold value**.**

The Shock of LDR

The LDR shock will be responded positively and negatively by ROA. The LDR shock from the Covid-19 pandemic was responded positively and weakened until it reached the equilibrium level until the 20th month, but the response would be negative after the 20th month. Based on the study period, the LDR tend to increase but during the Covid-19 pandemic the LDR decreased drastically but was still within the threshold range based on PBI No. 17/11/PBI/2015 that the lower limit of the LDR Target is set at 78% while the upper limit of the LDR is 92%.

The Shock of BOPO

The shock on BOPO during the Covid-19 pandemic was responded negatively by ROA. Over time, the shock will weaken and it is predicted that it will take recovery time to move towards balance for 30 months, assuming the waves of the Covid-19 pandemic that occur are only those covered in the research period. Figure 6 shows, that before 2019, BOPO was maintained with a fairly good level of efficiency reaching 78%, but there was a spike at the beginning of 2019 where BOPO soared to reach 87%. There was a significant decline in banking efficiency, and this was immediately corrected by achieving better efficiency. Another heavy blow hit banks whenthey entered the Covid-19 pandemic period where there was an 88% BOPO spike in February 2020. Despite the decline, the BOPO was still in the range above 84%. The increase in BOPO value was caused by a decrease in operating income and an increase in operating costs. The decrease in operating income was caused by a decrease in interest income due to low lending. Meanwhile, on the other hand, banking operational costs have soared due to the increase in CKPN costs which are used to cover the risk of customer default. During the Covid-19 pandemic, banks were faced with the problem of inefficiency. Based on SEBI No.15/7/DPNP concerning Opening of Commercial Bank Office Networks Based on Core Capital, a bank will operate efficiently if the BOPO value is less than 75%.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Based on the VECM estimation results that in the long term all research variables namely CAR, NPL, NIM, LDR and BOPO have a significant effect on ROA where CAR, NIM and LDR have a positive effect and NPL and BOPO have a negative effect on ROA. The ROA variable shock that occurred during the Covid-19 pandemic was responded to by ROA negatively. Over time, the shock will weaken and it is predicted that it will take time for recovery to move towards balance after the 10 month, assuming the waves of the Covid-19 pandemic that occur are only those covered in the research period.

Figure 3 shows, that ROA development has decreased during the pandemic period, but in early 2021 it has started to increase again. Despite the negative trend, the resilience of the banking business is still maintained, which is indicated by the resulting ROA value that is still in the range above 1.5%. The decline in RoA was caused by the poor functioning of the banking intermediation function. The demand for bank credit has decreased and resulted in lower LDR, increased operational costs due to an increase in CKPN expenses, which resulted in an increase in BOPO, decreased NIM, increased NPL due to a decline in credit quality even though it could be minimized by restructuring and reassessment policies.

Conclusion

The biggest impact felt by banks was the decline in banking performance, namely ROA. The shock that occurred in the banking financial indicator variables in the form of CAR, NPL, LDR, NIM and BOPO had an effect on banking both in the short and long run. In the short run, the shock on NIM has the largest impact on ROA performance while in the long run the largest impact is the NPL shock. The shock that occurs in banking financial indicators will weaken and return to early equilibrium. The prediction of the time needed for recovery from the shock varies from 5 months to 30 months assuming that only the pandemic shock is covered in the study period. During Covid-19 Pandemic, the resilience of the banking industry is still maintained and under control due to the implementation of various stimulus policies issued by the OJK to mitigate banking risks.

The recommendation for implementation from the study results, banks need to innovate banking products based on fee-based income as a banking income generator. The uncertainty of the end of the Covid-19 pandemic in Indonesia has caused banks to be very careful in lending in the midst of the economic downturn and the potential for lending with a high risk of default. Banks need to revise the priority scale of fund disbursement activities, look for alternative distribution of funds in the form of other productive assets, such as investments in securities that do not have high risk and are resistant to pandemic shocks and macroeconomic shocks. In addition, banking liquidity conditions that experienced positive growth during the pandemic can be utilized by banks by allocating it to liquidity reserves in the form of secondary reserves, so that the liquidity can not only function as it should, but can also become an income generator that can generate returns. Banks need to maintain and strengthen their capital in order to have a high ability to cover potential losses. Banks experiencing capital difficulties may conduct mergers or business combinations. Banks also need to control operational costs that are the burden of banks and review the methods of banking accounting recording approaches that can minimize the emergence of costs that become a burden on banks. Banks also need to restructure, reschedule and recondition loans that have the potential to experience a decline in quality.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

References

Afgani, K. F., Rivanda, A. K., & Purbayati, R. (2021). PREDICTING CORPORATE BANKRUPTCY : BASED ON MDA TEXTILE AND GARMENT ON INDONESIA STOCK EXCHANGE JIMEA | Jurnal Ilmiah MEA (Manajemen , Ekonomi , dan Akuntansi). 5(2), 1918–1932.

Barua, B., & Barua, S. (2021). COVID ‐ 19 implications for banks : evidence from an emerging economy. SN Business & Economics, 1–28. https://doi.org/10.1007/s43546-020-00013-w

Demirgüç-kunt, A., Pedraza, A., & Ruiz-ortega, C. (2021). Banking sector performance during the COVID-19 crisis. (xxxx). https://doi.org/10.1016/j.jbankfin.2021.106305

Duan, Y., Ghoul, S. El, Guedhami, O., Li, H., & Li, X. (2021). Bank Systemic Risk around COVID-19: A Cross-Country Analysis. Journal of Banking and Finance, 106299. https://doi.org/10.1016/j.jbankfin.2021.106299

Elnahass, M., Trinh, V. Q., & Li, T. (2021a). Global banking stability in the shadow of Covid-19 outbreak. Journal of International Financial Markets, Institutions and Money, 72, 101322. https://doi.org/10.1016/j.intfin.2021.101322

Fakhri, U. N. (2021). Comparison of Islamic and Conventional Banking Financial Performance during the Covid-19 Period I . Introduction. 4, 19–40.

Ghosh, R., & Saima, F. N. (2021). Resilience of commercial banks of Bangladesh to the shocks caused by COVID-19 pandemic: an application of MCDM-based approaches. Asian Journal of Accounting Research, 6(3), 281–295. https://doi.org/10.1108/ajar-10-2020-0102

Habir, M. T., & Wardana, W. (2020). COVID-19 ’ s Impact on Indonesia ’ s Economy and Financial Markets. (142), 1–13.

Joko, P. A., Bagas, A., & Ikhwan, A. (2020). The impacts of COVID-19 pandemic to informal economic sector in Indonesia : Theoretical and empirical comparison. (October). https://doi.org/10.1051/e3sconf/202020003014

Kalisman, J. H., Febrian, E. (2019). TRANSFORMATION IN BUSINESS STRATEGY : THE KEY FOR BPD PERFORMANCE IN INDONESIA. 22(2012), 8394.

Masdupi & Defri. (2012). PENGARUH CAPITAL ADEQUACY RATIO (CAR), LIKUIDITAS DAN EFISIENSI OPERASIONAL TERHADAP PROFITABILITAS PERUSAHAAN PERBANKAN YANG TERDAFTAR DI BEI. Journal of Chemical Information and Modeling, 01(01), 1689–1699.

Park, C., & Shin, K. (2021). COVID-19, nonperforming loans, and cross-border bank lending. Journal of Banking and Finance, (xxxx), 106233. https://doi.org/10.1016/j.jbankfin.2021.106233

Salih, A., Ghecham, M. A., & Al-Barghouthi, S. (2019). The impact of global financial crisis on conventional and Islamic banks in the GCC countries. International Journal of Finance and Economics, 24(3), 1225–1237. https://doi.org/10.1002/ijfe.1713

Sunarya, I. W. (2017). The Impact of Internal Performance and Macroeconomic Conditions on Profitability in Indonesian Banking From 2015-2017. 122–135.

Suwarsi, S., & Azib, A. L. (2017). The Influence of Islamic Social Reporting to the Return on Asset (Case study of Islamic Banks in Indonesia). International Journal of Management and International Business Studies, 7(1), 1–9.

Otoritas Jasa Keuangan (OJK). (2020). Kinerja Industri Perbankan Nasional Triwulan II 2020.

Otoritas Jasa Keuangan (OJK). (2020). Kinerja Industri Perbankan Nasional Triwulan I 2020.

Advanced International Journal of Business, Entrepreneurship and SME's
AIJBES
EISSN: 2682-8545
Volume 4 Issue 11 (March 2022) PP. 23-41
DOI 10.35631/AIJBES.411003

Otoritas Jasa Keuangan (OJK). (2019). Peraturan Otoritas Jasa Keuangan Republik Indonesia Nomor 37/Pojk.03/2019 Tentang Transparansi Dan Publikasi Laporan Bank.

Otoritas Jasa Keuangan (OJK). (2019). Peraturan Otoritas Jasa Keuangan Republik Indonesia Nomor 18 /POJK.03/2020 Tentang Perintah Tertulis Untuk Penanganan Permasalahan Bank.

Otoritas Jasa Keuangan (OJK). (2020). POJK Nomor 48 /POJK.03/2020 Tentang Perubahan Atas Peraturan Otoritas Jasa Keuangan Nomor 11/POJK.03/2020 Tentang Stimulus Perekonomian Nasional Sebagai Kebijakan Countercyclical Dampak Penyebaran Coronavirus Disease 2019.

Tan, B., Igan, D., Soledad, M., Peria, M., Pierri, N., & Presbitero, A. F. (2021). Government intervention and bank markups : Lessons from the global financial crisis for the COVID-19 crisis ☆. Journal of Banking and Finance, 133, 106320. https://doi.org/10.1016/j.jbankfin.2021.106320