



Covid-19 and The Effectiveness of Monetary Policy Quantitative Easing Indonesia

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Abstract—The basis for this research is to examine the impact of the Covid-19 pandemic on Indonesian financial markets and the dynamics of monetary policy. Focus on monetary policy conducted by Bank Indonesia regarding Quantitative Easing . The study was conducted using balance sheet information from a sample of 38 private foreign exchange banks in Indonesia to then find out whether policies have an effect on " loan growth ", and how the response to bank loan growth is in responding to the crisis episode caused by the COVID-19 pandemic . The data is taken from the first quarter of 2019 to the second quarter of 2021. Using panel data, a cross section of thirty-eight banks and time series data . This research found. First, the securities of Bank Indonesia conducted Quantitative Easing at the beginning of the year, until September 2020 amounting to Rp. 666 trillion resulted in an increase in total banking assets. Second, the Covid-19 factor has become a significant negative factor for credit growth amid the QE policies that have been carried out by Bank Indonesia. Third, the total bank deposit has a negative correlation with the rate of credit growth but is not significant. Finally, the overall analysis of this research shows that QE (Quantitative Easing) has a small impact on loan growth (loan growth) even though it has included the bank health factor (Bank Health) which represents the trust factor in the banking system.

Kata Kunci: Quantitative Easing; Covid-19; Policy Effectiveness; Monetary Policy; QE Policy

1. INTRODUCTION

Covid-19 pandemic caused economic shocks worse than the previous trade war, within three months of economic activity shrinking sharply and threatening a global recession. The development of the Indonesian economy was not spared from this disaster. The sharp slowdown in almost all sectors was caused by declining global and domestic demand and accompanied by weakening international commodity prices (Bappenas RI 2020) .

In contrast to the global crisis of 2008-2009 which had an indirect impact on the slowdown in global trade and was largely demand driven, there is now considerable pressure between a slump in production (supply) and a sharp collapse in demand (Kassa, 2020).

The Indonesian government announced the first positive case of Covid-19 on March 2, 2020. To reduce the negative impact on the economy from covid-19, the government carried out various policies and regulations by issuing Government Regulations Substituting for Laws Number 1 of 2020, dated March 31, 2020 which authorizes the government, the central bank (Bank Indonesia), and other relevant agencies to exercise freedom in their policies. Next, Perpu No. 1/2020 was replaced by Law no. 2/2020 which is legally stronger. The government raised its 2020 budget deficit target from 1.8% of nominal GDP to 6.3%. The increase in the budget deficit will be financed through the issuance of State Securities (SBN) (Sugandi 2021) .

In the history of crises, the world has experienced great pressure in the past, namely in the 2008-2009 financial crisis, and this gave birth to non-conventional monetary policies, one of which was Quantitative Easing , which was pioneered by Japan (Montgomery & Volz, 2019).

According to (Shiratsuka, 2010a), Quantitative Easing (QE) policy is a non-conventional monetary policy package that utilizes the assets and liabilities side of the central bank's balance sheet, designed to absorb shocks that hit the economy. The unconventional policies themselves are divided into two, namely Interest Rate Policies and Balance Sheet Policies. Interest rate policies consist of forward guidance on interest rates and negative interest rates while balance sheet policies consist of exchange rate policy , quasi-debt management policy , credit policy , bank reserve policy and forward guidance on balance sheet (Borio & Zabai, 2018).

How does the transmission of non-conventional monetary policy work, in this case is Quantitative Easing in Indonesia?

Indonesia in the face of Covid-19 by carrying out an expansionary monetary policy from January 2020, namely Bank Indonesia cutting the BI seven-day Reverse Repo Rate (interest rate policy) by 100 basis points bps to 4.00%. Bank Indonesia reduced the bank reserve requirement (GWM) ratio for conventional banks by 200 bps to 3.5% and for Islamic banks by 50 bps to 3.5% (1 May, 2020), and implemented various other macroprudential policies. Bank reserve requirement (USD) from 8% to 4% (16 March 2020). Bank Indonesia also carried out Quantitative Easing from the beginning of 2022 to September 2020 a total of Rp. 666 Trillion (Sugandi 2021) .

Findings from research on Quantitative Easing (Hosono, 2006; Kashyap and Stein, 2000), found that bank lending channels in Japan were concluded to function more effectively through smaller, less liquid banks, with higher capital ratios. Meanwhile, the findings in the study (Bowman et al., 2015) regarding the impact of non-conventional monetary policy in Japan as a pioneer in terms of Quantitative Easing policy (referring to "QE1") from 2001 to 2006



on bank lending positive and statistically significant of bank liquidity in bank lending during the period “ QE1 ”, but concludes that quantitatively it is very small, economically somewhat insignificant.

Several studies examining the Covid-19 pandemic era revolve around this (Aldasoro et al., 2020) seeing that all banks in " advanced economies " and developing countries (EMEs) are affected by the pandemic and expect credit markets to remain tight despite the recovery. has occurred in financial markets.

Research related to the effectiveness of Quantitative Easing (Alessandro Rebucci, Jonathan S. Hartley, 2022) suggests that Quantitative Easing has not lost its effectiveness in advanced economic countries and developing countries, also showing that Quantitative Easing interventions can have a significant effect on output.

Research (Ari, Chen, and Ratnovski 2020) sees that the EU banking system is currently in a better position to cope with the risk of non-performing loans (NPL) stemming from the pandemic compared to its position in the 2008 global financial crisis.

Meanwhile (Perkins et al. 2020) see that the US banking industry is still in a healthy position but needs to anticipate the risk of default on loans from banks that have a concentration of loans in their portfolios.

A large-scale asset purchase program known as Quantitative Easing simulates the economy in a way that should reduce the nonperforming rate (NPL) (Dell’ Ariccia et al., 2018).

Meanwhile for Indonesia, this research focuses on the monetary policy carried out by Bank Indonesia regarding Quantitative Easing. This research uses balance sheet information from a sample of 38 private banks in Indonesia (the categories of "healthy" and "unhealthy" banks) to then find out whether policies affect " loan growth ", and how the response of bank loan growth in response to crisis episodes caused by Covid-19 pandemic .

Novelty in this study previously stated that QE is more effective in small banks with small asset ownership (Hosono, 2006; Kashyap and Stein, 2000) is now carried out on banks that have relatively larger assets, and where previous research on advanced economies (Aldasoro et al., 2020; Ari et al., 2020; Perkins et al., 2020) are now carried out in Indonesia, which is a developing country (EMEs).

The data is taken from the 1st quarter of 2019 to the 2nd quarter of 2021 by including the Covid-19 factor that occurred in early 2020 which also started the Quantitative Easing policy in the Covid-19 period.

2. RESEARCH METHODOLOGY

2.1 Data

This study uses panel data from 38 balance sheets and financial statements of Indonesian foreign exchange private banks during the covid-19 period , 1st quarter of 2019 to 2nd quarter of 2021. The frequency of data is quarterly, such as balance sheets and financial statements information is reported every March, June, September and December. The analysis method uses static and dynamic panel data, namely pooled OLS, individual fixed effects, time fixed effects and Generalized Method of Moments. Thus, this research data panel includes a total of 3,411 observations.

Table 1. Summary of Statistics 2019-2021

Variable Name	mean	SD	Min	Max
Loan Growth (log change,%)	7.12%	1.19	0.9	8.78
Liquidity Ratio (%)	0.15%	0.09	3.87	0.48
SBRatio (%)	0.13%	0.11	0	1
Total Assets (log, million Rp)	7.55	0.59	6.55	9.05
Total Deposits (log, million Rp)	7.38	0.59	6.34	8.95
Equity Ratio (%)	0.18%	0.07	0.51	0.51
NPL (%)	3.27%	2.06	0.01	11.68
Dummy covid	0.5	0	0	1
Health Bank	0.4	0.5	0	1
No. of Banks (i)			38	
No. Of Time Periods (t)			10	
No. Of Observations			3411	

2.2 Empirical methodology

The study refers to research (Montgomery and Volz 2019) where the basic estimation of this research regresses the data panel described above using the following equation:

$$\Delta \log(Li,t+1) = \beta_0 + \beta_1 L Ri,t + B Xi,t + \beta_3 Dummycovid_{i,t} + \epsilon_{i,t+1} \tag{1}$$

$\Delta \log(Li,t+1)$ represents the log of changes in loans for banks i , when the bank i at time $t + 1$. $L Ri,t$ represents the bank's liquidity ratio at time $t + 1$, defined as the liquidity ratio ie cash from the balance sheet is divided by total assets. The next thing is to do the same treatment on securities, $S Bi,t$ (ratio of ownership of securities to total assets) to get a comparison of the data obtained on securities with loans. With the following equation form:



$$\Delta \log(L_{i,t+1}) = \beta_0 + \beta_1 SB_{i,t} + \beta_2 X_{i,t} + \beta_3 Dummy_{i,t} + \epsilon_{i,t+1} \tag{2}$$

SB, represents the securities *log* (securities ratio) for the bank at the time the bank *i*. *X_{i,t}*, represent vectors of control variables, including *log* total assets, *log* total deposits, equity ratio (ratio of bank equity to total assets), securities ratio (securities to total assets) and bad debt ratio (NPL; non-performing loans) for bank *i* at *t + 1* , *ε_{i,t+1}*: represents the error term for the bank at time (*t + 1*).

In equations 2 and 3, the main parameter is *1*, the coefficient on the liquidity ratio and the ratio of securities. If monetary policy is effective, the estimate of *1* will be positive for liquidity and negative for securities holdings and will be statistically significant, indicating that higher bank liquidity ratios lead to higher bank loan growth and vice versa for securities holdings.

To explore the implications of the model presented above, the study also estimated the following equations:

$$\Delta \log(L_{i,t+1}) = \beta_0 + \beta_1 LR_{i,t} + \beta_2 LR_{i,t} \times HealthyBank + \beta_3 Dummy_{i,t} + \epsilon_{i,t+1} \tag{3}$$

Where all variables are defined as above and is a dummy variable *with* a value of one for banks that meet the capital adequacy requirements and zero for unhealthy banks, obtained from the equity ratio above the average of a sample of 38 private banks that are categorized as healthy banks.

So, in equation 2, the coefficient estimate on the liquidity ratio will give us an overall estimate of the effectiveness of expansionary monetary policy as measured by an increase in the liquidity ratio, on bank loans. If the estimate of *1* is positive and statistically significant, it indicates that expansionary monetary policy is effective: higher bank liquidity ratios lead to higher bank loan growth. The new parameter of interest in equation 3 is *β₂*, the interaction coefficient of bank liquidity ratio *i* at time *t* , *LR_{i,t}* and new dummy variables (covid and bank soundness). If the estimate of *β₂* positive and statistically significant, the assumptions set out in the model above are correct: monetary policy is effective (or, if the estimate of *β₁* also positive, then we can conclude that monetary policy is very effective) in stimulating lending by healthy banks. that meet the required capital adequacy ratio.

The empirical methodology used in estimating equations (2) and (3) begins with simple Pooled Ordinary Least Squares (OLS) regression, then moves on to panel data analysis, exploring effects including individual fixed effects and time. Finally, to address concerns about lagging dependent variable bias, the study reported the results of the Generalized Method of Moment analysis (GMM) method.

2.3 Related Literature

This research is theoretically based on the bank model (Kopecky and VanHoose 2004) that existed in (Montgomery and Volz 2019) to develop a hypothesis about the interaction between monetary policy and bank capital regulation. The paper reveals why different banks may behave differently with monetary policy and under what conditions monetary policy can be effective. Kopecky and VanHoose (2004) model assumes a simplified bank balance sheet:

Assets	Liabilities
R	D
G	E
L	

Figure 1. Simplified Bank Balance

Where: R represents bank reserves , G represents government securities , L represents loans , D represents deposits , E represents capital .

$$R + G + L = D + E \tag{4}$$

$$R \geq \rho D \tag{5}$$

$$E \geq \theta L \tag{6}$$

$$C_G = \left(\frac{g}{2}\right)G^2 \tag{7}$$

$$C_L = \left(\frac{f}{2}\right)L^2 \tag{8}$$

$$C_E = \left(\frac{b}{2}\right)E^2 \tag{9}$$

$$r_R = 0 \tag{10}$$

$$r_D = 0 \tag{11}$$

$$r_G > 0 \tag{12}$$

$$r_L > 0 \tag{12}$$



Where, ρ represents the required reserve ratio; θ represents the minimum capital adequacy ratio required under current regulations; C_G represents the cost of managing government bonds; C_L represent the costs of loan management; C_E represents the cost of capital management ; r_i represents the cost of bank resources for $i = R, D, G, L$. C_i assumed to be a quadratic function because bank managers face an increase in marginal costs. Based on the above assumptions, the profit function of representative banks can be described as:

$$\pi = r_L L + r_G G - r_E E - \left(\frac{b}{2}\right) E^2 - \left(\frac{g}{2}\right) G^2 - \left(\frac{f}{2}\right) L^2 \tag{13}$$

Suppose that the central bank's instrument for implementing monetary policy is the targeted bank reserve level. Next, assume that financial markets operate under perfect competition. Then, subject to the constraints set out above in equations (1) for (10), profit maximization results in an optimal supply of loans, government bonds, and capital for the representative bank.

2.4 Unconventional Monetary Policy

The central bank's policy response to the current financial and economic crisis can be divided into three main areas: interest rate reduction policies; securing financial market stability; and facilitate corporate financing. In the second and third regions, central banks in major economies have introduced various unconventional measures in the range of financial assets purchased and the scale of those purchases. Central banks have implemented these unconventional measures by aggressively changing the size and composition of their balance sheets. Bernanke (2009a) first referred to the Fed's approach to supporting credit markets as credit easing, and pointed out a conceptual difference from the QEP (Quantitative Easing Policy) conducted by The Bank of Japan (BOJ). from 2001 to 2006. He argues that the stimulative effect of credit easing is highly dependent on the particular mix of lending programs and securities purchases that are tailored to the dysfunctional credit market in the United States.

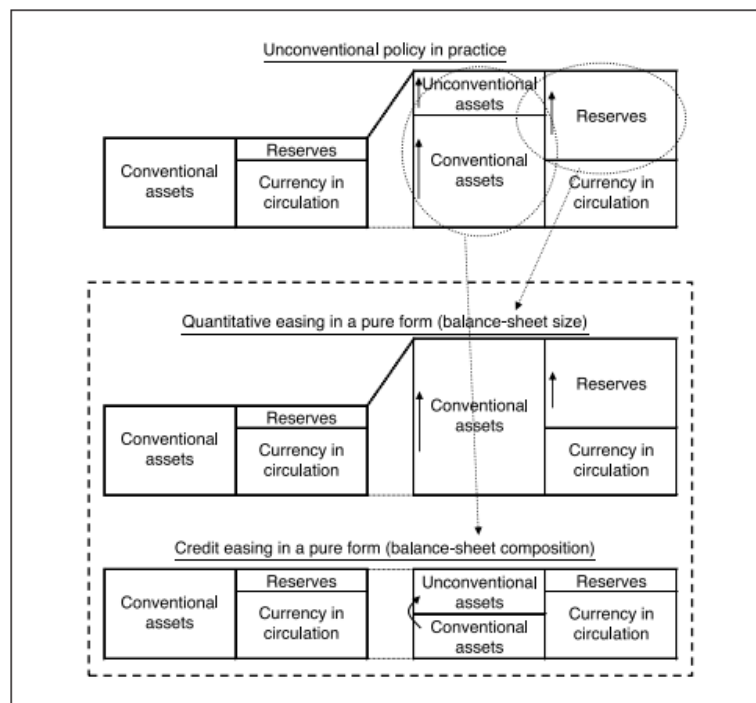


Figure 2. Illustration of Unconventional Policy Calculation

2.5 Trends in Bank Liquidity and Reserves during QEP

Evolution of Japanese bank liquidity and current account balances with the BOJ during QEP . Previous research defined a bank's liquid assets as the amount of safe cash, deposits at the BOJ and other banks, and call loans (short-term loans) to other banks. To the extent that QEP is intended to inject liquidity into the banking system by increasing bank checking account balances, we expect it to increase banks' holdings of liquid assets (Bowman et al. 2015) .

In the policy response to the current financial and economic crisis, both the asset and liability sides of the central bank's balance sheet play a different role than the portfolio rebalancing effect above. On the one hand, the asset side functions as a substitute for private financial intermediation, for example through the purchase of credit products. On the other hand, the liability side, particularly the expansion of excess reserves, serves as a buffer for liquidity risk in financial markets. In addition, the two parties interact closely with each other, because malfunctions in financial intermediation are closely related to liquidity risk funding in financial institutions, resulting in increased demand for excess reserves (Shiratsuka 2010b) .



Studies on the impact of Covid-19 on the financial system tend to cover the following: Three areas that often overlap in analysis: (1) the banking system and credit markets; (2) debt securities market; (3) stock market; and (4) foreign exchange market. Studies on the impact of Covid-19 on emerging market economies (EME) financial markets mostly analyze the dynamics of cross-border capital flows from developed economies to EMEs during the pandemic and their impact on EME financial system stability. (Sugandi 2021) .

3. RESULTS AND DISCUSSION

The empirical results of the estimation of equations (2), (3) and (4) are reported in tables 2 to 5.

Table 2. The Effect of Increasing Banking Liquidity Ratio Against Credit Growth

Variable	Pool	Individual FE	Time FE	Two Step System GMM	Two Step Difference GMM
Constant term	0.3	-0.89	-0.93*		
Liquidity Ratio	0.197	-0.187*	-0.187*	-0.15*	-0.13*
log Total Assets	1.82*	*1.19	1.20*	1.32*	1.45*
Equity Ratio	1.09	0.187	0.19	0.21	0.08
NPL	0.04	0.001	0.001	0.018	-0.0015
Total Deposit	-0.98	-0.133	-0.14	-0.42	-0.32*
Dummy Covid	-0.15	-0.038*	0.04*	-0.02*	-0.021*
No. Obs	317	317	317		252

Dependent Variable : Loan Growth

Table 3 . Effect of Increase in Banking Securities Ratio Against Credit Growth

Variable	Pool	Individual FE	Time FE	Two Step System GMM	Two Step Difference GMM
Constant term	0.14	-1,033*	0.59*		
SB Ratio	-0.66	-0.475*	-0.458*	-0.18*	-0.16*
log Total Assets	1.61*	1.19*	1.48*	1.52*	1.39*
Equity Ratio	1.84	0.34*	0.637*	0.8*	0.2
NPL	0.05	-0.0003	0.0099*	0.01	-0.0009
Total Deposit	-0.75	-0.106*	-0.472	-0.53	-0.25
Dummy Covid	-0.03	-0.034*	-0.044	-0.05	-0.018*
No. Obs	317	318	318		252

Dependent Variable : Loan Growth

The results obtained in Tables 2 and 3 regarding the effect of increasing the banking liquidity ratio and the ratio of banking securities on credit growth by including the dummy covid variable .

The empirical estimation results in tables (2) and (3) show that credit growth during the covid period (research), is positive and significant to total assets, negative and significant to the SB ratio (securities ratio), negative and significant to the liquidity ratio . NPL and equity ratio are positive but not significant, for dummy covid negative but not significant.

For total assets the results are the same across all these empirical methodologies –pools-OLS, panel data with individual fixed effects or time fixed effects, and for GMM – the coefficient of interest estimate is positive and highly statistically significant at the 5% level. This shows that banks with relatively higher liquidity ratios in a certain period tend to have statistically smaller credit growth in the following period.

Table 4. The effect of bank liquidity ratios on credit growth – bank health control variables

Variable	Pool	Individual FE	Time FE	Two Step System GMM	Two Step Difference GMM
Constant term	0.19	-0.89*	-0.93*		
Liquidity Ratio	0.4	-0.07	-0.07	-0.06	-0.09
log Total Assets	1.58*	1,115*	1.12*	1.50*	1.44*
Equity Ratio	1.82	0.90*	-0.906*	1.09	0.36
NPL	0.05	-0.001	-0.002	0.03	-0.0009



Variable	Pool	Individual FE	Time FE	Two Step System GMM	Two Step Difference GMM
Total Deposit	-0.75	-0.066	-0.07	-0.42	0.31*
Dummy Covid	-0.06	-0.021*	-0.02*	-0.01	-0.01
Healthy Bank	-0.03	-0.105*	-0.105	-0.26	-0.023
No. Obs		317	317		252

Dependent Variable : Loan Growth

Table 5. Effect of bank securities ownership on credit growth – bank health control variables

Variable	Pool	Individual FE	Time FE	Two Step System GMM	Two Step Difference GMM
Constant term	0.14	1.009*	1.04*		
SB Ratio	-0.72	0.37*	-0.37*	-0.58	0.0004*
log Total Assets	1.65*	1.13*	0.13*	1.32*	1.35*
Equity Ratio	1.74	0.875*	0.87*	1.04*	0.46
NPL	0.05	-0.002	-0.002	0.02	-0.0017
Total Deposit	-0.79	-0.06	-0.066	-0.3	-0.2
Dummy Covid	-0.03	-0.019*	-0.019*	-0.028	-0.01
Healthy Bank	0.014	-0.087*	-0.087	0.008	-0.03*
No. Obs	379	317	317		252

Dependent Variable : Loan Growth

Next, the results obtained in Tables 4 and 5 show that credit growth with a healthy bank control variable is positive and significant to total assets, negative and significant to the SB ratio (securities ratio), negative and significant to the liquidity ratio, but negatively correlated to covid-19 . This shows that the increase in covid will cause a decrease in credit growth.

That is, the empirical results again show that monetary policy is effective during the period of our study. For almost all empirical methodologies –pools , panel data with individual fixed effects or time fixed effects, and for GMM – the desired coefficient estimates are positive and highly statistically significant at the 5% level. This confirms that banks with relatively higher liquidity ratios in a given period tend to have statistically lower credit growth in the following period.

The findings in the research conducted on banks with relatively large assets (at a 5% confidence level) are in line with previous research which states that Quantitative Easing (QE) is more effective in banks with small asset ownership where the research was conducted in advanced economies (Aldasoro et al. 2020; Hosono 2006; Kashyap and Stein 2000; Perkins et al. 2020).

Meanwhile, for NPL (Non-Performing Loans) in previous studies (Ari et al., 2020; Dell’Ariccia et al., 2018) which were conducted in developed countries and the results were reduced, but the findings of research conducted in the period of Covid-19 which was carried out in Indonesia this time was not as mentioned, although for the NPL and covid variables, both were not significant.

4. CONCLUSION

This study found, during the covid-19 period, Bank Indonesia carried out a quantitative easing monetary policy by capturing empirical evidence that there was an increase in total assets in banking, in this case, thirty-eight private banks were the objects of research. However, the increase in total assets does not necessarily increase bank credit. The policy during the Covid-19 pandemic period , Quantitative Easing (QE) did not result in accelerated bank credit growth in line with the still weak demand for credit, a condition where the demand side of the Indonesian economy was still weak. Findings in the first study , the securities of Bank Indonesia conducted Quantitative Easing at the beginning of the year, until September 2020, amounting to Rp. 666 trillion resulted in an increase in total banking assets. Second , the Covid factor has become a significant negative factor for credit growth amid the QE policies that have been carried out by Bank Indonesia. Third, the total bank deposit has a negative correlation with the rate of credit growth but is not significant. Finally, our overall analysis shows that the Quantitative Easing carried out by Bank Indonesia during the Covid-19 period had little impact on loan growth , even though it has included the bank health factor (Bank Health) which represents the trust factor in the banking system. The limitation of this research is that the research was conducted only on conventional banks, so it is worried about that it does not meet the elements of comprehensive conclusions needed for policy makers. Recommendations for further research are expected to be carried out on conventional and Islamic banks, where the population of Indonesia is predominantly Muslim, thus meeting the need for a comprehensive analysis



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