The Effectiveness of Banking Countercyclical Policies in the Development of Priority Economic Sectors in Indonesia

Muh Rudi Nugroho[a, b, *] (iD) and Akhmad Syakir Kurnia[c] (iD)

[a]Lecturer at Faculty of Islamic Economics and Business, UIN Sunan Kalijaga Yogyakarta, Indonesia.
[b]Doctoral Student at Faculty of Economics and Business, Universitas Diponegoro, Indonesia.
[c]Lecturer at Faculty of Economics and Business, Universitas Diponegoro, Indonesia.

Abstract: Economic development leads to the evolution and improvement of the financial system. In particular, banks grew relatively larger than national output in line with economic developments. This study aims to analyze how banking policy can cause multiplier effects for the macroeconomic sector and be able to reduce the procyclicality of the banking sector with economic growth that touches the aspect of reverse causality. To answer this concern, many international forums approved the formation of documents one of which includes macroprudential aspects by developing countercyclical capital buffer (CCB) indicators that function to monitor the level of procyclicality of the financial system. The research period used is quarterly data from 2010Q1 to 2019Q4. The analytical tool used is structural vector autoregression (SVAR). Based on the results of the impulse response function, all macroeconomic variables used in this study, namely real GDP, inflation, investment, and the exchange rate respond negatively to CCB policies in conventional banks, Islamic banks, and both. The biggest contribution of the three bank models is to the investment variable. Based on the results of sector mapping, it was found that the direction of the development of Indonesia's priority sectors was in the secondary sector or business fields related to the processing industry, such as both food and beverage, clothing and textiles, and chemicals. Public and foreign public confidence in the products of the processing industry in Indonesia is certainly inseparable from the guarantee of certainty in doing business and investment security that will increase the flow of private capital, especially foreign direct investment. This investment security guarantee is an effect of good financial capital liquidity.

Keywords: *Countercyclical Capital Buffer, Prosiclicality, Macroeconomic, and Priority Sector.*

Introduction

The development of the financial sector occurs in the process of establishing and developing institutions and markets that underpin large-scale investment and growth that help to reduce poverty. Therefore, the development of the financial system is able to provide information on which investments are likely to be more profitable and as a medium for promoting optimal capital allocation (Guru & Yadav, 2019). The relevance of financial development of economic growth has been started with Goldsmith (1969) who attempted to investigate first how economic growth leads to a change in financial structure. In this case, he found that economic development leads to the evolution and improvement of the financial system. In particular, he stated that banks grew larger relative to national output in line with economic development.

The speed of credit transmission and its effect on economic growth is highly dependent on the characteristic of the economy and the business scale ratio of the financial sector relative to the amount of gross domestic product (GDP) of a country. The greater the credit ratio to GDP, the greater its influence on economic growth, so that in the long term credit growth and economic growth will stimulate each other (Pramono et al., 2015; Sardianou et al., 2021). Following is the illustration of the

---

annual GDP growth rate on a year-over-year basis for the last 5 years (specifically for 2020 used the second-quarter data).
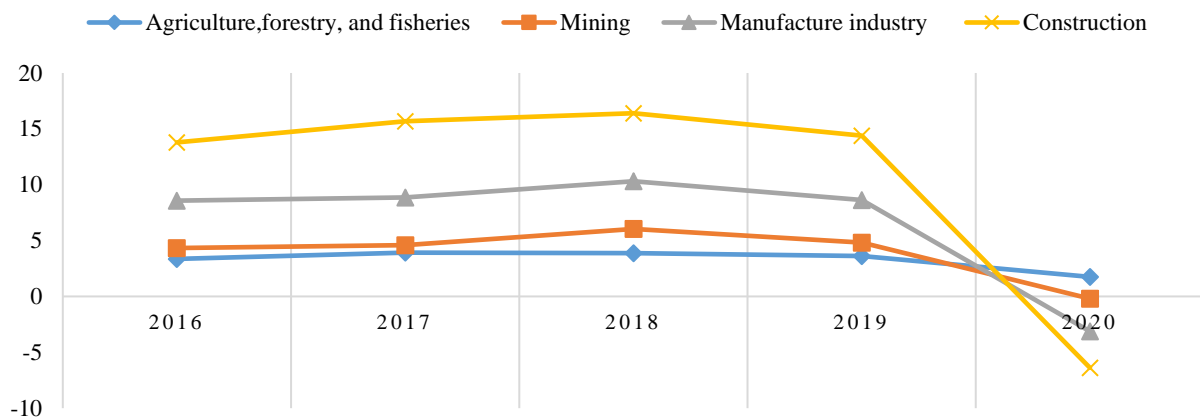

Figure 1. Annual GDP Growth Rate (yoy)
Source: Central Bureau of Statistics (BPS).

The annual GDP growth rate in the last five years, as shown in Figure 1, seems to fluctuate with a smooth trend, but fell significantly in 2020. This reduction is an effect of the Covid-19 pandemic which began to spread in early 2020. Meanwhile, based on the Central Bureau of Statistics (BPS) report, it can be seen that the structure of the Indonesian economy from quarter to quarter itself did not change significantly from 2015 to 2018. Four business sectors that provide the largest contribution to GDP are the manufacturing industry, agriculture, forestry, fisheries, wholesale and retail trade, car and motorcycle repair, and mining. The largest business sector portion that contributes to GDP every quarter is the secondary sector, namely the manufacturing sectors which contribute 20,06% on average followed by agriculture, forestry, and fisheries with a contribution of 13,04%. Moreover, wholesale and retail trade, car and motorcycle repair contributed 13,06 % on average, while the mining sector contributed 7,53%.

The theory demonstrates that there is a certain threshold effect that must be achieved before the financial sector has a positive impact on economic growth. In particular, the banking sector with economic growth reaches the aspect of reverse causality. This is in line with the Solow model which shows that if the saving rate is high, the economy will have large capital stock and high output level (Mankiw, 2007). The substantial role of bank credit certainly increases the risks faced. Both are internally influenced by competitiveness in the banking industry and externally in the form of macroeconomic variables. On the other hand, high credit growth can be seen as normal and is a positive consequence of increasing finances depending on the economy. However, at the same time, there are ideas about the implication of credit growth on financial stability and macro conditions are growing as well, especially when rapid credit growth is accompanied by a weakening current account and financial sector vulnerability.

To what extend credit growth can be considered conducive to growth and do not create pressure on inflation and the micro condition of the bank? The credit growth assessment is not concerned only with the level of credit but in which sector the credit is distributed as well. The simultaneous negative movement between the capital buffer and the business cycle is procyclical and has been considered as an important factor that enabled the bank to become vulnerable to financial turmoil in 2008 (Huang & Xiong, 2015).

To answer this concern, many international forums such as G20, Financial Stability Board (FSB), and Basel Committee on Banking System (BCBS) agreed to the establishment of the document "Basel III: Global Regulatory Framework for More Resilient Bank and Banking System" (BCBS, 2010). One of the concerns of this documents covers the macro-prudential aspect by developing a countercyclical capital buffer (CCB) indicator which functions to monitor the level of procyclicality of the financial system and requires both conventional and Islamic Banks to prepare buffers when the economy is good

(boom period) or during a crisis (bust period) (Pramono et al., 2015; Sardianou et al., 2021; Wezel, 2019).

According to Basel committee in conference 2010, the main purpose of CCB is to ensure that bank has large enough capital support that allows them to absorb unexpected losses when faced with negative systemic shocks which expected to do not sacrifice lending to the real economy. The main characteristic of the CCB policy is a policy that is countercyclical and can be activated (CCB rate above 0%) when the financial cycle is in the expansion phase, which is suspected to have accumulated risk that could lead to a crisis or system instability (BCBS, 2010).

Based on the description above, measuring the effectiveness of countercyclical capital buffer in the Indonesian Bank to control the macroeconomy to achieve priority economic targets is considered important given that the contribution of financial institutions especially banks in developing countries dominated the country's economy. In the era of the Covid-19 pandemic especially, various priority sectors need serious attention to strengthen national stability. In reality, the flow of bank funds is dominated by relatively safe investments such as bonds (*Sukuk*). It has resulted in slow economic growth in priority sectors that have a strategic role in national economic stability.

In this research, the measurement of the effectiveness of the countercyclical capital buffer was carried out on three bank models, which are conventional banks, Islamic banks, and all banks (combination between conventional banks and Islamic banks). This research was conducted to measure the effectiveness of the countercyclical capital buffer policy taken by authorities towards the development of economic sectors priority in Indonesia.

The rest of the paper is organized as follows. Section 2 discusses the theoretical foundation and hypothesis development. Section 3 focuses on the methods. Section 4 analyzes the empirical results. Section 5 concludes.

Literature Review

Competitive Advantage of Priority Sectors

The concept of competitive advantage simply shows the ability of a region to make promote its product both domestically and internationally. This competitive advantages concept is more suitable to employ for measuring financial feasibility or to measure the competitiveness of economic activity. The relevant body of literature is currently highlighting four key competitive priorities, namely low cost, quality, delivery performance, and flexibility (Berry et al., 1991; Idris & Naqshbandi, 2018; Ward et al., 1995).

Effectivity in Economic System

A country with the characteristics of a fixed exchange rate or monetary union arrangement will not get much benefit if out of the excluded rules and become debt-free and adopts policies considered credible by the market (Bossone, 2019). Therefore, regulation or policy is needed that can effectively balance the economy and finances of a country. As a consequence, if authority policy is not credible it will cause the flow of foreign capital to flee, the nominal exchange rate depreciates, and domestic inflation increases (Bossone, 2014). The concept of effectiveness in economics is often used to describe phenomena that occur in a process of managing limited resources.

According to Heinz Weihrich and Harold Koontz, effectiveness is also used to assess whether an activity or policy has been carried out correctly (Guswai, 2007). Effectiveness in the Islamic perspective uses the *maqasid sharia* approach which is used as a measure to what extent the government programs can meet the need of religion, soul, mind, and treasure (Ahmad, 1994).

Sustainability Growth of Financial Institution with Macroeconomics

When considering growth it would be wise to see it as a non-monolithic construct for two reasons. First, growth can be multidimensional and can occur in economic, social, or environmental aspects. However, so far economic growth has been the only aspect that is usually acknowledged. Second, growth is capable to produce positive, negative, or neutral consequences (Bossone, 2014). Growth in human development indicators (according to United Nations) is a target and it's important for the welfare of society. Therefore, it is important to consider that sustainable growth is not limited only to consumption or growth alone, but a common nature, pattern, and equal distribution (Salimath & Chandna, 2018).

The sustainable development goals (SDGs) are to achieve long-term sustainable development by 2030. The SDGs combine social and environmental goals to achieve sustainable development and address environmental concerns. In addition, SDGs also linked sustainable development and sustainable business issues, such as responsible production and consumption, while still driving economic growth to create a decent workplace. The World Bank estimates the domestic government will provide 50 to 80% of funding for the SDGs and the remaining funds should come from investors. Thus, the SDGs can be an opportunity for the financial industry to more define sustainability principles an involved in sustainable financing development. Therefore, the banking industry needs to improve the ethics code of the financial sector by integrating the SDGs, aligning existing sustainable finance strategies with the SDGs, standardize SDGs accounting and reporting to identify the strength and weaknesses, as well as risks and opportunities of the banking industry in addressing the SDGs, and developing innovative financial products based on SDGs. Furthermore, government and financial regulators must align financial regulation with sustainable development and SDGs, offer a financial mechanism to mitigate financial risk in addressing the SDGs, and aligning development banks with the SDGs (Weber, 2021).

The financial crisis that occurred required the role of the financial sector in sustainable development and force the bank to provide sustainable disclosure by the 17 SDGs 2030 agenda. The finding of a study indicates that the high priority of the banking sector for SDGs is related to economic growth and decent job, as well as the need for strategic planning to support sustainable growth (Sardianou et al., 2021).

Banking and Countercyclical Capital Buffer (CCB)

Over the past few years, national macro-prudential authorities have developed different strategies to set countercyclical capital buffer (CCB) levels in the banking sector. The existing approach is based on various indicators used to identify the current phase of the financial cycle. However, no approach directly considers the prudential behavior of banks during the financial cycle as well as cyclical risk in the banking sectors. Thus, a new profit-to-provisioning approach was formulated that can be used in the macro-prudential decision-making process. A new set of indicators that largely capture the risk of provision cycles of loan gains and losses have been formulated. In this context, the bank must save some of their cyclically overestimated profits (expected losses which not materialize) during the financial boom. This profit-to-provisioning approach is relevant to the CCB decision-making process and can contribute to a more precise assessment of accumulated systemic risk and risk materialization (Pfeifer & Hodula, 2021).

In a study that aimed to complete the standard Basel countercyclical capital buffer framework, additional actions were formulated to address the credit gap that could be used to measure financial cycles and to decide countercyclical capital buffer in banks. The actions are: change in the credit-to-GDP ratio over two years, credit growth compared to the two-years average of nominal GDP growth (eight-years moving average); credit growth compared to 5% annual nominal growth over two years, and credit growth relative to the trend value of nominal GDP over two years. The indicators are derived based on the Basel standard Hodrick-Prescott filter with a long-term sample (Reigl & Uusküla, 2021).

Research conducted by Beck, et al. (2013) documents the relationship between competition and banking stability that is influenced by court-specific factors. Meanwhile, Čihák and Hesse (2010) in their research found that large Islamic banks are not stronger than small Islamic banks. In particular, their findings show that small Islamic banks tend to be financially stronger than small conventional banks, but large Islamic banks tend to be less powerful than large conventional banks. Using the model adopted by Čihák and Hesse (2010), Bourkhis and Nabi (2011), it can be concluded that Islamic banks are financially stronger than conventional banks before and during the financial crisis. Although Islamic banks became less stable after the financial crisis, they remained dominant over conventional banks in terms of their financial soundness.

The focus of this research is to examine the effectiveness of the countercyclical capital buffer (CCB) policy applied in banking in controlling Indonesia's macroeconomics. This policy was introduced by the Basel Committee on Banking Supervision (BCBS) within the framework of Basel III. Activation (setting the rate) of CCB is influenced by the condition of systemic risk accumulation. When systemic risk tends to increase, the bank must start to form an additional buffer in the range of 0%-2,5% (Bank

Indonesia, 2015). In accordance with PBI No. 15/12/PBI/2013 regarding the Minimum Capital Adequacy Requirement (KPMM) for commercial banks, the CCB policy start to be implemented on January 1, 2016.

To support the readiness of CCB policy implementation in Indonesia, several studies related to CCB have been carried out, mainly research related to the main indicators that can be used to generate the CCB value. Furthermore, the main indicator proposed is the credit-to-GDP gap. The credit-to-GDP gap indicator proposed in this research is a combination of econometric estimation and justification (Pramono et al., 2015; Sardianou et al., 2021).

The narrow credit to-GDP gap is defined as the difference between the ratio of bank financing to GDP and its long-term trend. In the CCB guide issued by BCBS (2010), it is stated that the main indicator which is the leading indicator is expected to provide a signal about 2-3 years before the crisis occurs.

Credit Cycle

Credit has a role in supporting healthy and sustainable economic growth. Both bank credit and non-bank credit can encourage financial deepening, generate growth and economic development if resources are allocated efficiently. The moderate level of the corporate sector will encourage healthy and sustainable investment. A healthy banking system will be created when the bank can select and assess the creditworthiness of debtors (customers) (Flamini et al., 2019).

CCB functions to reduce risks arising from excessive credit growth and limit the pro-cycle of bank credit. CCB is a broad-based and time-varying capital instrument designed to achieve macroprudential objectives of protecting the banking sector from risk caused by excessive aggregate credit growth. CCB is counter-cyclical, thus contribute to countering the pro-cyclical of the financial system due to an increase in credit cycles. In the downturn, CCB will help to reduce the risk that credit supply is constrained by overly tight capital requirements that could trigger a credit supply crisis, undermine real economic performance, and result in future credit losses (Flamini et al., 2019).

The credit cycle is defined as the deviation of the credit-to-GDP ratio from its long-term trend. This measure has been introduced by BCBS (2010) as the main reference indicator calibrating CCB mainly because of its forecasting power in predicting banking crises in many countries (Flamini et al., 2019; Frait et al., 2015). With this proxy, empirical evidence is found that the credit gap is a strong predictor of systemic vulnerability. Thus, credit cycle monitoring can be carried out to identify the level of vulnerability, especially in emerging markets, which tend to be more vulnerable to sudden external shocks (Frait et al., 2015).

Previous Research

Many previous studies were conducted to determine the effect of countercyclical policies. According to BCBS (2010), the deviation of the ratio and GDP from its long-term trend is an indicator that shows a better signal performance for the need to build capital before the crisis. Most banking crisis were identified with excessive credit growth (Bonfim & Monteiro, 2013; Borio & Drehmann, 2009; Pfeifer & Hodula, 2021; Reigl & Uusküla, 2021; Reinhart & Rogoff, 2011; Schularick & Taylor, 2009; Visser & Vuuren, 2018; Wezel, 2019).

Procyclicality plays an important role in finance both in normal and crisis conditions. This influence does not only come from the way market participants behave but also from the risk matric used and regulations collected and released during busts and booms periods. The implementation of the countercyclical capital buffer aims to thwart procyclicality by accumulating (releasing) capital in rising conditions (downswing), further reducing the amplitude of the financial cycle and promoting macro-prudential stability. In one study that used Kalman filter on South African data and confirmed the procyclicality of the Basel Committee on Banking Supervision (BCBS), recommendations to use alternatives such as the residential property index have appeared. The results show that the buffer signal depends on the filter used. So it can be said that the buffer signal is very dependent on the filter used to detect procyclicality. The banking industry and regulators should reconsider using the Hodrick-Prescott filter and explore the possibilities of using the Kalman filter instead (Visser & Vuuren, 2018).

In a study that focuses on the problem of calibrating CCB in European countries. It was found that the main indicator for buffer decisions under the Basel III framework – the credit-to-GDP gap, did not

always perform well in terms of covering bank loans losses that exceeded what could be expected from an economic downturn. In contrast, in the case of countries with short financial cycles and or low financial deepening such as transition and developing economies, the Basel gap proves to work best when calculated with a low smoothing factor and adjusted with the level of financial deepening. Another finding is that there is a tradeoff between buffer size stability and cost efficiency considerations (Wezel, 2019).

Huang and Xiong (2015) analyze the banking behavior when making decisions on capital buffer levels in business cycle fluctuations and transmission that allow CCB to affect China's macroeconomics. In this study, it was found that the capital buffer in China behaves countercyclically to the business cycle. In relation to the CCB, the researcher stated that the existence of a capital strengthening policy such as CCB will be more strengthen the countercyclical behavior of Chinese banks (Pramono et al., 2015).

Research conducted by Drehmann and Gambacorta (2012) found that buffers can reduce credit growth during a boom and attenuate credit contraction after release. It would help to reduce procyclicality alongside the beneficial effect of higher capital levels in terms of higher resilience of the banking sector to shocks. This study found that government social spending (positive) was procyclical in Asian countries in 1980-2012. However, in the last 10 years, emerging Asian countries or countries with developed economies have shifted from procyclical to countercyclical social policies. The procyclicality trend in South Asian Association for Regional Cooperation (SAARC) countries diminished after 1997, so social spending in Far Eastern countries in Asia become more countercyclical. This caused countries in Asia to escape the procyclicality trap during the 2008 economic crisis (Ahuja & Murthy, 2017).

A study conducted by Leitao (2010), examined the relationship between financial development and economic growth for European Union (EU-27) countries and the main developing countries BRIC (Brazil, Russia, India, and China) using a static and dynamic panel data approach. The results show that this study considers productivity and trade where these proxies confirm a positive effect on economic growth in the EU-27 and BRIC member countries.

Posnaya et al. (2018) in their research which analyzed economic capital in the assessment of bank capital, found that financial institutions should focus on the utilization of economic capital. The process of determining and recording economic capital improves internal risk management and helps the bank to set strategic goals.

Using the Solow growth model (1956), research that employed a theoretical framework based on the causality concept of the savings rate with a country's capital obtained results in four provinces in China that represent different economic, social, and development models for the study. It can be concluded that private companies play a more important role in urban development while households contribute more in developing areas (Hooi Lean & Song, 2009).

A study conducted by Yusgiantoro et al. (2019) from the Indonesian Financial Services Authority (OJK) documented that higher bank market power tends to increase bank solvency as measured by Z-score using simple leverage ratio (ZEQTA) or CAR. It is known from the results of this study that the positive relationship between market power and financial stability in banking is also due to the fact that higher market power increases the banking capital ratio.

Research Method

Research Data

This research uses a quantitative method that is processed by the structural vector autoregression (SVAR) method and supported by impulse response function (IRF) and forecast error variance decomposition (FEVD). The type of data employed is time-series data with a quarterly period from 2010 to 2018. The year 2019 is not included in the observation period because 2019 is the political year and Indonesia's democracy is at stake in the legislative and presidential elections of the Republic of Indonesia. Currency fluctuations that do not follow the trend of the previous year have the potential to trigger bias. Meanwhile, the data for 2020 is not included in the observation period as well, because that year was the beginning of the Covid-19 pandemic which had an impact on various aspects of life, including the economic aspect. In general, the performance of the national economy was declined

during the year, including the banking industry which marked by the amount of re-schedule bank financing or credit. This condition can also trigger a bias in the available financial data.

All variables in this study were considered endogenous variables. The research variable used is the main indicator of the countercyclical capital buffer namely the narrow credit to GDP gap in conventional banks, Islamic banks (BUS and UUS), and all banks (conventional banks and Islamic banks), as well as macroeconomic variables of real GDP, inflation, investment, and real exchange rate.

The narrow credit to GDP gap is the sum of all bank financing in a country compared to GDP. The narrow credit-to-GDP gap is the main indicator for an early warning system that is suitable to be implemented in Indonesia. The data unit used is in the form of a ratio and obtained from the Indonesian Banking Statistics (SPI) processed. In Mankiw (2007), real GDP is the value of goods and services measured at constant prices or base-year prices. The units used for this real GDP variable are billions of rupiah and the data is obtained from the Central Bureau of Statistics (BPS) Indonesia.

In Karim (2015), inflation is measured by the inflation rate, namely the rate of change from the general price level. The most frequent indicator used to measure the inflation rate is the CPI. This index is a price indicator that has been used to measure the success of monetary policy in controlling inflation (Kuncoro, 2015). The data in this study were obtained from the publications of Bank Indonesia and the variable units used were data in the form of percentages.

In developing countries, the GDP value is usually higher than the value of the gross national product (GNP), because foreign investment (FI) is more than the product of its citizens abroad. Therefore, in this study, the investment used is foreign direct investment in the country. The unit is in million USD. The last macroeconomic variable used is the real exchange rate, which is the nominal exchange rate that has been corrected with relative prices. Relative prices are prices in the country compared to average prices abroad. The real exchange rate in this study is written in the form of nominal IDR/USD and it is obtained from the statistic of Bank Indonesia.

Analysis Method

The weakness of the vector autoregression (VAR) model is that it is unable to capture the deterministic movement of time series data. Therefore, structural vector autoregressive (SVAR) was developed to analyze the deterministic of the VAR model. Analysis using the SVAR method requires the data to be stationary. The main purpose of the SVAR model is to obtain a non-recursive orthogonal IRF analysis of the error term (error due to the same repetition). The analytical procedure used in this SVAR method is as follows.

The stationarity test fulfills the assumption if it is time-series data that does not contain unit roots, on the other hand, non-stationary data is data whose mean, variance, and covariance of the data are constant over time (Thomas, 1997). Determination of the optimal lag length is important in the SVAR model. If the optimal leg is too long, it's feared that it will result in an inefficient estimation due to the reduced degree of freedom. The optimal lag length in this study was obtained using information criteria, such as Akaike information criterion (AIC), Schwarz criterion (SC), and likelihood ratio (LR). In this research, the co-integration test was carried out by looking at the residual value which was tested with the ADF test. The hypothesis test is as follows.

H_0: There is no long-term relationship between the dependent and independent variables.
H_a: There is a long-term relationship between the dependent and independent variables.

To analyze the SVAR estimation results, it is necessary to test the stability of the model to obtain a valid impulse response function and variance decomposition. The invalid impulse response function and variance decomposition will be generated if the estimated SVAR model is unstable. The stability test of the SVAR model is said to meet the stability assumption if all the roots of the polynomial function are in the unit circle or if the absolute value is less than one so that the impulse response function and variance decomposition obtained is considered valid.

The Granger causality test was conducted to determine whether the dependent variable could be treated as an independent variable. In this study, Granger's causality method was used to test the existence of causality between the two variables. SVAR model or better known as the theoretical VAR model is used to obtain non-recursive orthogonalization of the error term in the impulse response analysis framework. To obtain the non-recursive error term orthogonalization, several restrictions must

be formed which identify the structural components in the error term. So that the econometric model framework in this study is stated as follows.

$$
\begin{bmatrix} e_{ncgdpgap} \\ e_{gdp} \\ e_{inf} \\ e_{inv} \\ e_{exchange\ rate} \end{bmatrix} = \begin{bmatrix} 1 & 0 & 0 & 0 & 0 \\ a_{21} & 1 & 0 & 0 & 0 \\ a_{31} & a_{32} & 1 & 0 & 0 \\ a_{41} & a_{42} & a_{43} & 1 & 0 \\ a_{51} & a_{52} & a_{53} & a_{54} & 1 \end{bmatrix} \begin{bmatrix} u_{ncgdpgap} \\ u_{gdp} \\ u_{inf} \\ u_{inv} \\ u_{exchange\ rate} \end{bmatrix}
\tag{1}
$$

Equation 1 shows the level of endogeneity. The first equation explains the effect of the narrow credit to GDP gap on the narrow credit to GDP gap itself. The second equation explains that the real GDP is influenced by the narrow credit to GDP gap and the value of real GDP itself. The third equation explains that inflation is influenced by the narrow credit to GDP gap, real GDP, and inflation itself. The fourth equation explains that investment is influenced by the narrow credit to GDP gap, real GDP, inflation, and the investment itself. The last equation illustrates that the real exchange rate is influenced by the narrow credit to GDP gap, real GDP, inflation, investment, and real exchange rate itself.

Impulse Response Function

The main objective of the SVAR model is to obtain a non-recursive orthogonal IRF from the error term (error due to the same repetition). Estimation of the impulse response function was carried out to examine the shock response of endogenous variables to other variables. The impulse response graph will show the response of the variable due to the shock of other variables up to several periods after the shock. If the impulse response graph shows a movement that is getting closer to the equilibrium point (convergence) or back to the previous balance, it means that the response of a variable due to shock will disappear over time so that the shock does not leave a permanent effect on the variable.

Forecast Error Variance Decomposition

According to Enders (2013), forecast error variance decomposition (FEVD) or analysis decomposition of variance of forecasting errors is used to analyze the contribution of dependent variable diversity to the shock of another dependent variable for the following times.

Result and Discussion

Before conducting the impulse response function analysis, several assumptions were made to meet the SVAR test criteria.

SVAR Criteria Assumption Test

Based on the results of stationarity analysis, it can be seen that all variables, both in the conventional and Islamic banks as well as all banks sample are stationary in the first difference using the Phillips-Perron (PP) test. Further, the optimal lag length in this study was obtained using the Akaike information criterion (AIC), Schwarz criterion (SC), and Hanan-Quin criterion (HQ) where the lowest value of each indicator is in the first lag. Because all indicators are at lag 1, therefore it can be concluded that any shock that exists in one variable will be responded to by another variable with a lag of one-quarter period. The result of Granger causality analysis on the three bank models can be seen that the exchange rate and (ln) narrow credit to GDP gap have a causal relationship, while other variables do not influence each other. A stability test was carried out to see the unit circle inverse roots of the autoregressive characteristic polynomial. The system is assumed to be stable if all of its unit roots have more than one modulus.

It is known that there is no more than one modulus value in the three models. The highest value of modulus for conventional banks, Islamic banks, and all banks are 0.994319, 0.998442, and 0.993542, were respectively meet the assumption of SVAR stability. This illustrates that the SVAR model formed is stable. This test is reinforced by the statement no root lies outside the unit circle – VAR satisfies the stability condition. In addition, the stability of the model can be detected by using the AR roots graph

which is seen from the points in the graph which are in the circle (see Figure 2), so that it can be said to be a stable model.
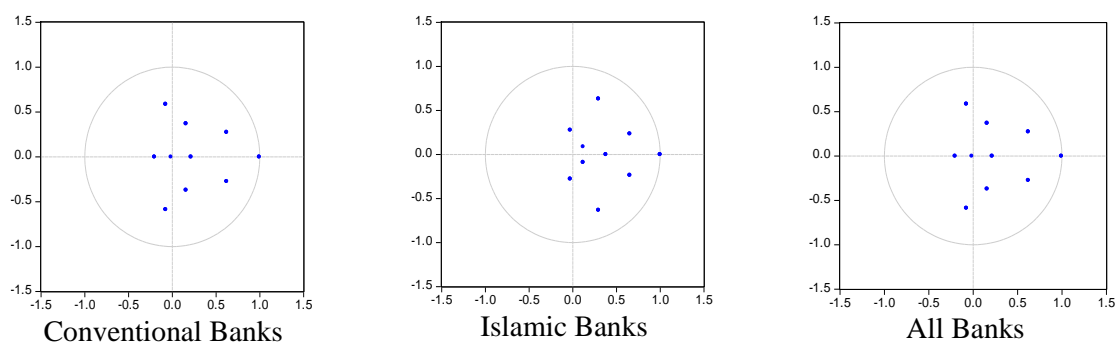

Figure 2. AR Roots Test of Conventional Banks, Islamic Banks, and All Banks

Because the data is stationary in the first difference, further testing is necessary to see the possibility of cointegration. Based on the results of the augmented Dickey-Fuller test in the three bank models, it can be seen that the trace statistic value is smaller than MacKinnon at the level of 1% so that all variable has been tested are co-integrated or have a long-run relationship.

Structural Impulse Response Function (SIRF) Test

In the SIRF test by looking at the graph, the vertical axis is the standard deviation value used to measure how many responses will be given by one variable when a shock occurs in another variable. Through the SIRF test, this study was able to see the response of macroeconomic variables to the application of the CCB variables for the next 50 quarters. In this study, the short, medium, and long-term effects were taken from the graph in the 2nd, 25th, and 50th periods. The horizontal axis shows the future period of a given response to a shock. If the response line is under the horizontal axis then the shock will have a negative effect, but if the response line is above the horizontal axis, it will have positive effects. The closer the value to zero, the smaller the response, and the farther away from the zero, the greater the response. The response line is declared stable if the value shown does not fluctuate in the next period.

To see the response movement of the (ln) narrow credit to GDP gap on macroeconomic variables in the conventional bank model, see Figure 3. The response of the (ln) narrow credit to the GDP gap variable due to the shock on macroeconomic variables is graphically shown by the blue line. The response of the (ln) narrow credit to GDP gap against itself initially shows a positive value, then goes to a negative value and moves around zero. The response of the (ln) narrow credit to GDP gap against (ln) real GDP shows a fluctuating response. At the first, it shows a positive value, then goes to zero, then decreases towards a negative value, and then moves steadily around zero. The response of the (ln) narrow credit to GDP gap to inflation shows a movement from a negative value and getting close to zero and then moving steadily around zero. The (ln) narrow credit to GDP gap response to investment shows a fluctuating response. In the beginning, the response was negative, then moved towards positive, then towards zero, and then moves steadily around zero. The last variable is the response of the (ln) narrow credit to GDP gap to the real exchange rate which shows that it was initially around zero, then negative, then increased and become positive and move stably around zero.

Furthermore, to see the movement of the (ln) narrow credit to GDP gap response to macroeconomic variables in the Islamic bank model, see Figure 4. The response of the (ln) narrow credit to GDP gap to the shock of itself, in the beginning, shows a positive value and then moves around zero. The response of (ln) narrow credit to GDP gap to (ln) real GDP shows a fluctuating response. In the beginning, the value was around zero, then moved up positive, then down towards zero, and then moved steadily around zero. The response of the (ln) narrow credit to GDP gap to inflation shows a stable movement around zero. The response of the (ln) narrow credit to GDP gap to investment shows a fluctuating response. In the beginning, the response is around zero, then drops to a negative value, then moved towards positive, and then moves steadily around zero. The last is the response of the (ln) narrow credit to GDP gap to the real exchange rate which indicated that the variable was moving stable around zero.
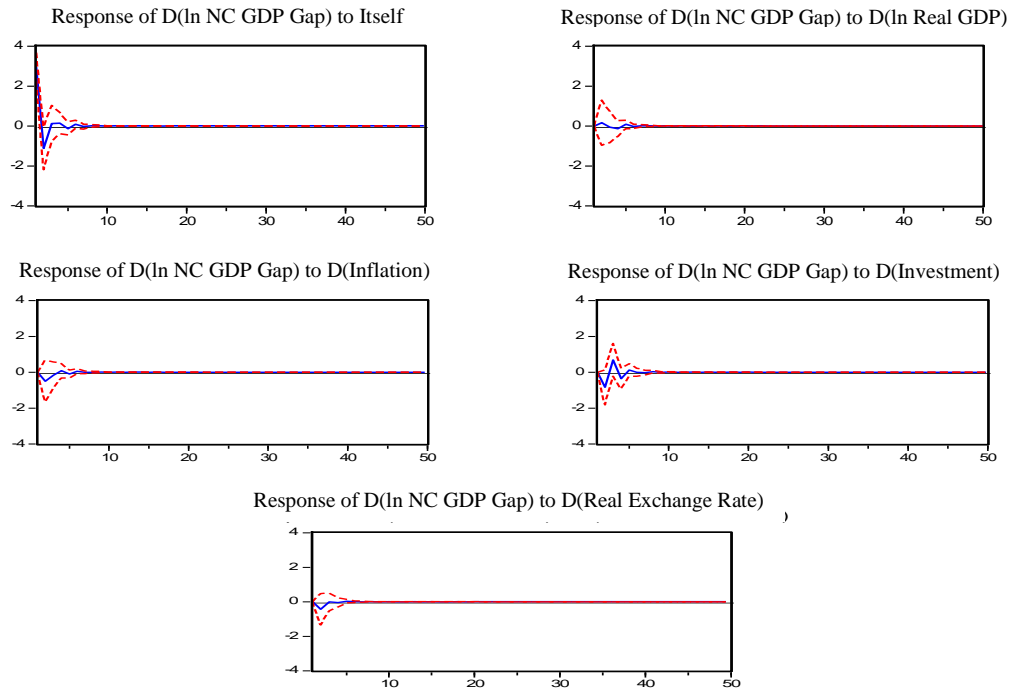
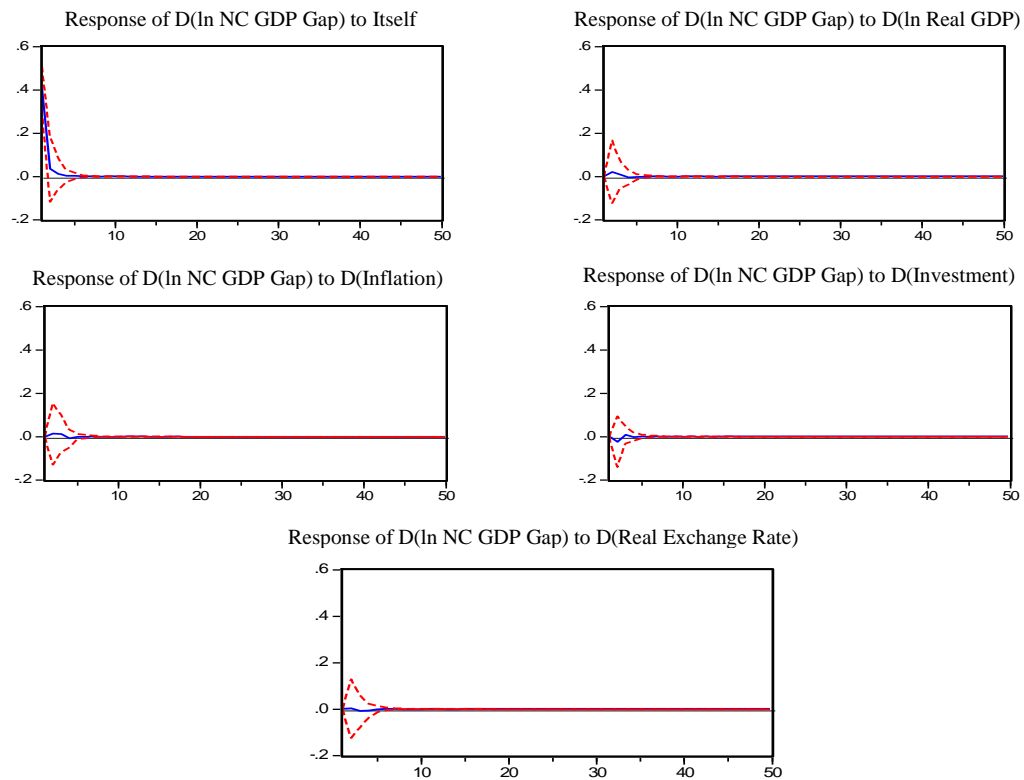Figure 3. Structural Impulse Response Function Test for Conventional Banks

Figure 4. Structural Impulse Response Function Test for Islamic Banks

Response of D(ln NC GDP Gap) to Itself

Response of D(ln NC GDP Gap) to D(ln Real GDP)

Response of D(ln NC GDP Gap) to D(Inflation)

Response of D(ln NC GDP Gap) to D(Investment)

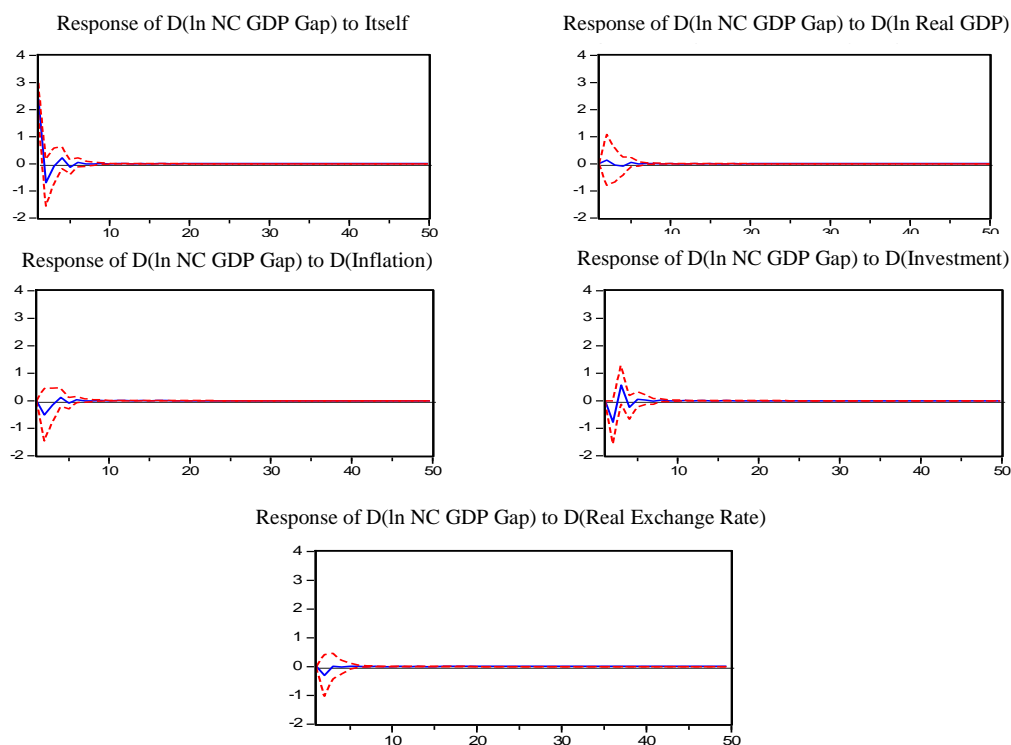Response of D(ln NC GDP Gap) to D(Real Exchange Rate)

Figure 5. Structural Impulse Response Function Test for All Banks

Finally, to see the movement of (ln) narrow credit to GDP gap response on macroeconomic variables in the all bank model, see Figure 5. The response of the (ln) narrow credit to GDP gap due to the shock of itself initially shows a positive value, then moves in a negative direction, and then moves steadily around zero. The response of the (ln) narrow credit to GDP gap against (ln) real GDP initially showed a fluctuating response, then dropped to zero and moved steadily around zero. The response of the (ln) of narrow credit to GDP gap to inflation initially showed a negative movement, then rose and stabilized around zero. The (ln) narrow credit to GDP gap response to investment shows a fluctuating response. First, the response is around zero the drops to a negative value, then moves towards positive, and then moves towards negative and stabilizes around zero. The last variable is the response of the (ln) narrow credit to GDP gap to the real exchange rate which indicates that the variable initially moved in a negative direction and then stabilized around zero.

Mapping of Priority Economic Sectors and Effectiveness of Banking Countercyclical Policy in Supporting Development of Priority Economic Sector

The Indonesian economy sector does not always have definite growth. Sometimes the existing sectors have a fluctuating value because they are influenced by various factors, such as natural conditions, government regulation, and periodic events. The Covid-19 pandemic is one of the phenomena that have a significant impact on national economic growth. Therefore, before explaining how the condition of banking countercyclical policies to priority sectors, first the pattern of development sectors in Indonesia was explained. In Figure 6, the business field is mapped between the primary, secondary and tertiary sectors. It can be seen that the business fields that are included in the Indonesian primary sector are business fields engaged in agriculture, fisheries, and mining or simply a sector engaged in raw goods. The classification of the secondary sector is a business field that is engaged in the industrial sector or processing and trading. This sector is dependent on the primary sector because production activities are influenced by available raw goods. Next is the tertiary sector, where this sector is a classification of sectors engaged in services (see Table 1 for details).
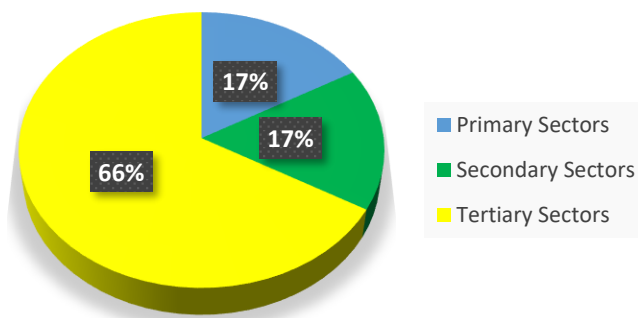
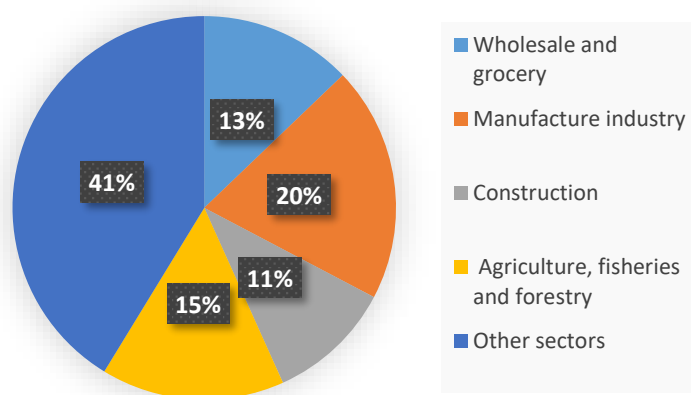Figure 6. Percentages of Business Fields by Sector Category

Figure 7. GDP Distribution based on Sector Categories (Quarter II-2020)
Source: Central Bureau of Statistics (BPS).

Table 1. Sector Category

Primary Sectors	Secondary Sectors
1. Agriculture, hunting, and forestry	1. Manufacture industry
2. Fishery	2. Electricity, gas, and water
3. Mining and excavation	3. Wholesale and grocery

Tertiary sector	
1. Construction	7. Education service
2. Accommodation and food	8. Health service and social activities
3. Transportation, warehousing, and communications	9. Social service, social-culture, entertainment, and personal services.
4. Financial intermediary	10. Individual services which serving households
5. Real estate, rental business, and company service.	11. International agencies and other extra international bodies.
6. Government administration, defense, and mandatory social security	12. Activities with unclear boundaries

Based on Figure 7, five sectors that become Indonesia's economic priorities as described in the Making Indonesia 4.0 Roadmap are food and beverage, textiles and clothing, automotive, electronics, and chemistry. Three of these five priority sectors, namely food and beverage, textiles and clothing, and chemicals are included in the processing business field (classified as a secondary sector). The manufacturing business field itself in the 2016-2019 period gave the highest average GDP distribution

compared to another business field, which was 20.38%. Likewise, until the second quarter of 2020, the manufacturing industry still becomes the business field that provides the highest distribution of GDP by 20%. This was driven by an increase in domestic demand for textiles and paper as well as an increase in domestic and foreign demand for food, beverage and pharmaceutical commodities.
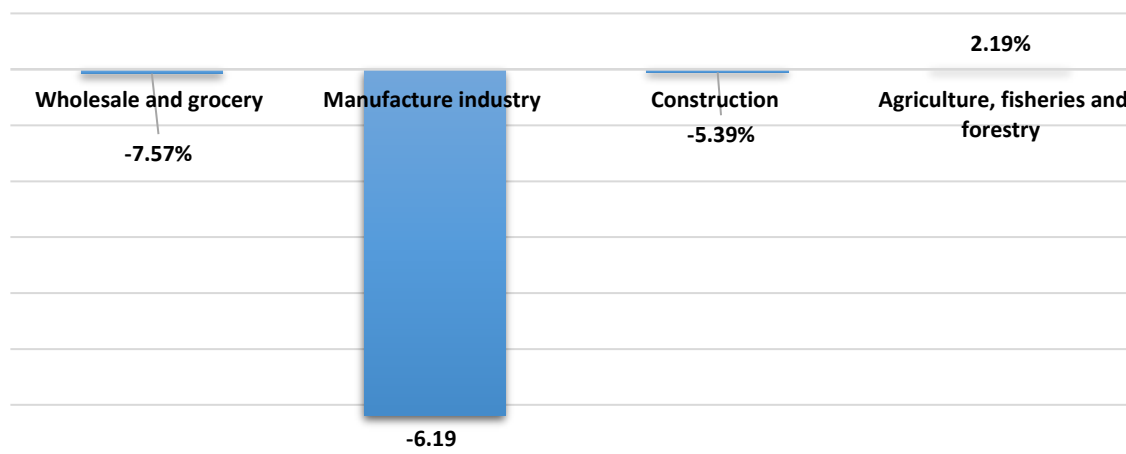

Figure 8. Indonesia's Sectoral GDP Growth Quarter II-2020
Source: Central Bureau of Statistics (BPS).

In general, the Indonesian economy experienced an economic downturn in 2020 (see Figure 8). Until the second quarter of 2020 several sectors experienced negative growth, including the manufacturing industry with the highest negative growth. This condition is an effect of the Covid-19 pandemic which began to spread in early 2020. As an effort to restore economic conditions after the Covid-19 pandemic, these main sectors must receive development priorities in order to accelerate the recovery of national economic conditions.

Utilizing bank capital will be good if it is distributed as working capital, given the fact that the manufacturing industry is a priority sector based on the Making Indonesia 4.0 review and the sector which is also included in the business field with the highest GDP distribution. Table 2 shows a summary of the analysis of the effectiveness of conventional banks, Islamic banks, and all banks in the short, medium, and long term[1]. Optimizing economic growth in priority sectors can accelerate national economic growth in the midst of the Covid-19 pandemic.

Table 2. The Effectiveness of the Narrow Credit to GDP Gap Policy on Macroeconomic Stability

Narrow Credit to GDP Gap	Macroeconomic Stability											
	Real GDP			Inflation			Investment			Real Exchange Rate		
	Short	Mid.	Long	Short	Mid.	Long	Short	Mid.	Long	Short	Mid.	Long
Conventional Banking	0,22%	0,44%	0,44%	2,26%	2,55%	2,55%	6,46%	11,15%	11,15%	1,70%	1,62%	1,62%
Islamic Banking	0,27%	0,33%	0,33%	0,09%	0,23%	0,23%	0,34%	0,38%	0,38%	0,00%	0,07%	0,07%
Total Bank	0,25%	0,40%	0,40%	3,70%	4,09%	4,09%	8,60%	12,98%	12,98%	1,35%	1,27%	1,27%

Based on Table 2, it can be seen that CCB of the conventional banks is able to reduce procyclical risk between narrow credit to GDP gap and real GDP in the medium and long-term by 0.44% and give a stable value to GDP. Meanwhile, in the short term, it is more effectively controlled by Islamic banks

---

[1] The complete result of forecast error variance decomposition (FEVD) shows that the conventional bank, Islamic, and all bank models have the largest contribution to investment variable. In conventional banks, it can be seen in the initial period, the contribution to investment variable was 0% but continued to increase in the second period by 6% until the 13th period. Furthermore, the contribution to investment variance experienced a stable development until the end of the period. In the Islamic bank model, the initial period of contribution to investment was 0% but continued to increase in the second period by 0.097% until the 9th period. Starting from the 9th period, it can be seen that the contribution to the investment variance experienced a stable of 0.3% until the end of the period. The last is the all bank model, the contribution to the investment variable in the initial period is 0%, but continues to increase in the second period by 8% until the 12th period. Starting from the 12th period, it can be seen that the contribution to investment variance experienced a stable development until the end of the period.

with a contribution of 0,27% with a negative response. In the interaction of the effectiveness of narrow credit to GDP gap policy on the inflation variables, the combined CCB policy of the conventional and Islamic bank model was able to reduce the inflation rate by 3.70% in the short term and 4.09% in the medium and long term.

The third variable used is related to the interaction of the effectiveness of the narrow credit to GDP gap policy on investment variables, the CCB policy in a combination of conventional banks and Islamic banks was able to reduce the growth rate of foreign direct investment by 8,60% in the short term and 12,98% in the medium and long term. The last variable used is related to the interaction of the effectiveness of the narrow credit to GDP gap policy on the rupiah exchange rate against the USD, the CCB policy of conventional bank model in the short term was able to reduce the rupiah exchange rate against the USD by 1,7 % and in the medium and long term by 1,62%, which mean strengthening the exchange rate of the rupiah against the USD.

The secondary sector is currently a priority sector for development with the demand for Indonesian products abroad. In addition, the economy by relying on the manufacturing sector is able to provide more value to Indonesia's GDP when compared to production in the primary sector which relies on the distribution of raw goods. Looking at the direction of Indonesia's priority economy which leads to the industrial business field or is a sector that processes raw materials into finished goods, thus the role of lending and bank financing is certainly very important. As a driving force of industry, capital is an element of the production process. This manufacturing sector driver is very strategic because more than 80% of the workforce in the industrial sector works in micro, small and medium enterprises (MSMEs), including farmers and small producers (BPS, 2019). The manufacturing based on the natural resource industry is expected to provide a multiplier effect.

In developing countries, the value of GDP is usually higher than the value of the gross national product (GNP), because foreign investment is more than the resulting products of its citizens abroad. Providing guarantees of business certainty and investment security will increase the flow of private capital, especially foreign direct investment. This investment security guarantee is an effect of the good liquidity of the financial capital system. This is because public distrust of the financial system will be followed by panic behavior by investors to withdraw their funds, which will lead to liquidity problems.

Classical economic theory initiated by Adam Smith stated that the higher interest rate will encourage people to sacrifice or reduce consumption spending than diverted by increasing savings. This can delay economic growth. The higher the interest rate, the lower the public's desire to invest, while the lower the interest rate, the higher the public's desire to invest. This increase in interest rates causes the investor to think twice before applying for credit.

Conclusion and Policy Recommendation

Conclusion

This paper measures the effectiveness of the banking countercyclical policy on macroeconomics and its implication for the priority economic sector in Indonesia. The results show that the countercyclical capital buffer policy for conventional banks, Islamic banks, and all banks responds negatively to the macroeconomic variables used in this study. In the three banks categories, the largest contribution is to the investment variables.

Based on the results of the mapping sector, it was found that the direction Indonesian priority sectors developments are in the secondary sector or business field related to the processing industry both food and beverage, clothing and textile, as well as chemical. The direction of priority economic development that leads to the manufacturing industry in its development was influenced by demand both at home and abroad as well as the high demand for periodic events (religious holidays, school holidays, and so on). Thus, looking at the trend towards the development of Indonesia's priority economic sectors that lead to the manufacturing industry, the role of banks in carrying out their intermediation function especially the priority of facilitating credit distribution in this sector was very important. In addition, this priority sector also dominates the need for workforce. So that if the priority economic sector increase, it will create a positive multiplier effect for the national economy.

Policy Recommendations

Policy recommendations that can be made as an effort to create effective policy that reduce the procyclicality of banking cycles and create a multiplier effect on priority sectors of the Indonesian economy are the need for implementing countercyclical policies to regulate the amount of credit and to distribute the financing as well as additional capital that needs to be formed when systemic risk tends to increase. This policy is expected to create financial system stability by being able to allocate sources of funds and absorb negative shocks that occur to prevent disruptions to both real sectors and the financial sector. The percentage of credit distribution to priority sectors and supporting sectors need to be studied more deeply. It is hoped that by continuously increasing capital in priority sectors, it will not override capital in supporting sectors. Thus, other sectors outside of the priority sectors continue to show good developments for the Indonesian economy, especially for regions that do not have business fields in priority sectors.

Economic growth in priority sectors must be the main agenda, with the aim to support the acceleration of national economic growth during the recovery period due to the Covid-19 pandemic. Mapping of Indonesia's priority sector needs to be more detailed, related to the sectors inputs, both in terms of raw materials, labor, and technology. Policy focus can be done by periodically looking at the current direction of the economy, whether it is dominated by the MSMEs sector or large-scale industry. It is necessary to carry out further analysis related to the risks faced by the upstream sector of priority business fields both natural resources and human resources to create efficiency.

References

Ahmad, A. (1994). *Mu'jam al-muqayyis fi al-lughah*. Dar al-Fikr.

Ahuja, D., & Murthy, V. (2017). Social cyclicality in Asian countries. *International Journal of Social Economics*, *44*(9), 1154–1165. https://doi.org/10.1108/IJSE-04-2016-0112

Basel Committee on Banking Supervision. (2010). *Guidance for national authorities operating the countercyclical capital buffer* (December). https://www.bis.org/publ/bcbs187.pdf

Beck, T., Jonghe, O. De, & Scepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation, 22*(2), 218-244. https://doi.org/10.1016/j.jfi.2012.07.001

Berry, W. L., Bozarth, C. C., Hill, T. J., & Klompmaker, J. E. (1991). Factory focus: Segmenting markets from an operations perspective. *Journal of Operations Management*, *10*(3), 363–387. https://doi.org/10.1016/0272-6963(91)90074-8

Bonfim, D., & Monteiro, N. (2013). *The implementation of the countercyclical capital buffer: Rules versus discretion* (Financial Stability Report November). Economics and Research Department, Banco de Portugal. https://www.bportugal.pt/sites/default/files/anexos/papers/ar201306_e.pdfs

Borio, C., & Drehmann, M. (2009). Assessnig the risk of banking crises - revisited. *BIS Quarterly Review*, *March*, 29–46.

Bossone, B. (2014). *Secular stagnation* (Discussion Paper No. 2014-47). Kiel Institute for the World Economy. http://www.economics-ejournal.org/economics/discussionpapers/2014-47

Bossone, B. (2019). The portfolio theory of inflation and policy (in) effectiveness. *Economics: The Open-Access, Open-Assessment E-Journal, 13*(2019-33), 1-25. http://dx.doi.org/10.5018/economics-ejournal.ja.2019-33

Bourkhis, K., & Nabi, M. S. (2011). Have Islamic banks been more resistant than conventional banks to the 2007-2008 financial crisis? *The Economic Research Forum*, *616*, 1–27.

Badan Pusat Statistik. (2019). *Produk domestik bruto indonesia triwulanan 2015-2019* (Katalog 9301003).

Čihák, M., & Hesse, H. (2010). Islamic banks and financial stability: An empirical analysis. *Journal of Financial Services Research*, *38*(2), 95–113. https://doi.org/10.1007/s10693-010-0089-0

Drehmann, M., & Gambacorta, L. (2012). The effects of countercyclical capital buffers on bank lending. *Applied Economics Letters*, *19*(7), 603–608. https://doi.org/10.1080/13504851.2011.591720

Enders, W. (2013). *Applied econometric time series 2nd edition*. John Wiley & Sony Inc.

Flamini, V., Bologna, P., Di Vittorio, F., & Zandvakil, R. (2019). *Credit cycle and capital buffers in Central America, Panama, and the Dominican Republic* (IMF Working Papers, Issue 039). https://doi.org/10.5089/9781484397992.001

Frait, J., Hájek, J., & Plašil, M. (2015). *Detecting credit cycle and setting countercyclical capital buffer in the Czech Republic* (Project No. 16-2150S). Czech National Bank. https://cepr.org/sites/default/files/CZ_Frait_CZ_paper_clean.pdf

Goldsmith, R. W. (1969). *Financial structure and development*. Yale University Press.

Guru, B. K., & Yadav, I. S. (2019). Financial development and economic growth: Panel evidence from BRICS. *Journal of Economics, Finance and Administrative Science*, *24*(47), 113–126. https://doi.org/10.1108/JEFAS-12-2017-0125

Guswai, C. . (2007). *How to operate your store efetively yet eficiently*. Gramedia.

Hooi Lean, H., & Song, Y. (2009). The domestic savings and economic growth relationship in China. *Journal of Chinese Economic and Foreign Trade Studies*, *2*(1), 5–17. https://doi.org/10.1108/17544400910934315

Huang, X., & Xiong, Q. (2015). Bank capital buffer decisions under macroeconomic fluctuations: evidence for the banking industry of China. *International Review of Economics and Finance*, *36*, 30–39. https://doi.org/10.1016/j.iref.2014.11.005

Idris, F., & Naqshbandi, M. M. (2018). Exploring competitive priorities in the service sector: Evidence from India. *International Journal of Quality and Service Sciences*, *11*(2), 167–186. https://doi.org/10.1108/IJQSS-02-2018-0021

Karim, A. . (2015). *Ekonomi makro Islam*. PT Raja Grafindo Perkasa.

Kuncoro, M. (2015). *Mudah memahami dan menganalisis indikator ekonomi*. UPP STIM YKPN Yogyakarta.

Leitao, N. C. (2010). Financial development and economic growth: A panel data approach. *Theoretical and Applied Economics, 17*(10(551)), 15-24.

Mankiw, N. . (2007). *Makroekonomi*. Penerbit Erlangga.

Pfeifer, L., & Hodula, M. (2021). A profit-to-provisioning approach to setting the countercyclical capital buffer. *Economic Systems*, *45*(1). https://doi.org/https://doi.org/10.1016/j.ecosys.2021.100853

Posnaya, E. A., Dobrolezha, E. V., Vorobyova, I. G., & Chubarova, G. P. (2018). The economic capital model in bank's capital assessment. In Grima, S. & Thalassinos, E. (Eds.), *Contemporary issues in business and financial management in Eastern Europe (Contemporary studies in economic and financial analysis* (pp. 111-119). Emerald Publishing Limited, Bingley. https://doi.org/10.1108/S1569-375920180000100013

Pramono, B., Hafidz, J., Adamanti, J., Muhajir, M. H., & Alim, M. S. (2015). *Indikator utama, reciprocity, dan pengaturan countercyclical capital buffer di Indonesia* (Laporan Hasil Penelitian, Departemen Kebijakan Makroprudensial, Bank Indonesia).

Reigl, N., & Uusküla, L. (2021). Alternative frameworks for measuring credit gaps and setting countercyclical capital buffers. *Journal of Financial Economic Policy*, *13*(2), 161-179. https://doi.org/https://doi.org/10.1108/JFEP-04-2019-0070

Reinhart, C., & Rogoff, R. (2011). *This time is different: Eight centuries of financial folly*. Pricenton University Press.

Salimath, M. S., & Chandna, V. (2018). Sustainable consumption and growth: Examining complementary perspectives. *Management Decision, 59*(6), 1228-1248. https://doi.org/10.1108/MD-12-2016-0934

Sardianou, E., Stauropoulou, A., Evangelinos, K., & Nikolaou, I. (2021). A materiality analysis framework to assess sustainable development goals of banking sector through sustainability reports. *Sustainable Production and Consumption, 27*, 1775-1793. https://doi.org/10.1016/j.spc.2021.04.020

Schularick, M., & Taylor, A. M. (2009). Credit booms gone bust: Monetary policy, leverage cycles, and financial crises, 1870-2008. *Journal of Chemical Information and Modeling*, *53*(3), 556–581. https://doi.org/10.1017/CBO9781107415324.004

Thomas, R. . (1997). *Modern econometrics: An introduction*. Addison-Wesley.

Visser, D., & Vuuren, G. van. (2018). Filter selection for countercyclical capital buffers. *South African Journal of Economic and Management Sciences*, *21*(1), 1–14. https://doi.org/10.4102/sajems.v21i1.1744

Ward, P. T., Duray, R., Keong Leong, G., & Sum, C.-C. (1995). Business environment, operations

strategy, and performance: An empirical study of Singapore manufacturers. *Journal of Operations Management*, *13*(2), 99–115. https://doi.org/10.1016/0272-6963(95)00021-J

Weber, O. (2021). *The financial sector and the SDGs: Interconnections and future directions* (CIGI Paper No. 201). https://www.cigionline.org/publications/financial-sector-and-sdgs-interconnections-and-future-directions/

Wezel, T. (2019). *Conceptual issues in calibrating the Basel III countercyclical capital buffer* (IMF Working Paper, WP/19/86).

Yusgiantoro, I., Soedarmono, W., & Tarazi, A. (2019). Bank consolidation and financial stability in Indonesia. *International Economics*, *159*(November), 94–104. https://doi.org/10.1016/j.inteco.2019.06.002