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The Role of Central Bank Rate on Credit Gap in Indonesia: A Smooth Transition Regression Approach

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Abstract

This paper examines the effect of the interest rate set by Bank Indonesia on financial system stability as measured by the credit gap in Indonesia for quarterly data for the period 1976 Q1 to 2019 Q4. We suppose that the relationship between the Central Bank rate and the credit gap is non-linear. Hence, this study applies a smooth transition regression (STR) model to investigate the relationship between these variables. Our results are: first, by performing STR estimation we obtained a threshold level of Central Bank rate of 2.01. Second, a decrease in the Central Bank rate results in a reduction in the credit gap when the Central Bank rate is above or below the threshold level. The effect of the Central Bank rate is five times greater for the high regime than for the low regime. Third, we find evidence that the effect of the exchange rate, economic growth, inflation, and GDP per capita on the credit gap for the high regime is the opposite of the low regime. We suggest that policymakers need to keep the Central Bank interest rate low and stable so that the role of the bank as a financial intermediary remains stable and conducive to strengthening financial stability.

Keywords: Central Bank Rate, Credit Gap, Exchange Rate, Non-Linear Estimation

JEL Classification Code: E51, E58, F31

1. Introduction

The role of the Central Bank as the monetary authority has undergone a significant change since the global financial crisis in 2008-2009. Bank Indonesia, like other central banks around the world, has a role to play in controlling the stability of the financial system in addition to controlling monetary stability. This is due to the interrelationship between the two stabilities that cannot be separated from each other (Warjiyo & Juhro, 2019). According to Jeanneau (2014), of the 114 central banks globally that he had observed, as many as 82% of these central banks have the aim of achieving financial system stability.

One of the characteristics of the financial system in developing countries, including Indonesia, is a banking-center in a financial system (Cottarelli et al., 2015). Banks have a crucial role in the economy as they act as intermediaries for people with excess funds (creditors) as well as those who need funds (debtors). Banking has a vital role in the financial system in Indonesia because banking activities are directly influenced by the policies of Bank Indonesia. Banking credit is also the main factor in financing the real sector in Indonesia.

This study aims to measure the effectiveness of the interest rate set by Bank Indonesia on financial system stability with the credit gap as a proxy variable for financial stability. This study includes various control variables, such as exchange rate, economic growth, inflation, and money supply, which all have a significant influence on bank credit. Various studies have been conducted by previous researchers regarding the relationship between the interest rate and credit growth, although the results are inconclusive. Akinlo and Oni (2015), Thaker et al. (2013), and Kim and Mehrotra (2018) concluded that the interest rate has a positive effect on credit

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growth. Hoffman (2001), Kiss et al. (2016), and Shingjergji and Hyseni (2015) obtained empirical evidence that interest rate has a negative effect on credit growth. Several previous studies on the effect of Central Bank interest rates on credit growth in Indonesia also vary.

This study is different from the existing studies because in previous studies the relationship between interest rates and credit growth was investigated using a linear estimation model and not taking into account the nonlinear relationship between those variables. We believe that the effect of changes in the interest rate on credit growth will be different when the interest rate is high and low. When the interest rate is low, an increase in interest rate may have a positive effect on credit growth because investors expect to gain profits from their future business such that demand for credit might increase. Concerning the supply side of credit, banks have more incentives when there is an increase in interest rates such that the credit supply increases. Finally, it increases credit growth. Conversely, when interest rates are high, an increase in interest rates causes a higher cost of funds, which in turn will reduce demand for credit and subsequently reduces credit growth.

Based on that view, we use non-linear regression to analyze the effect of Central Bank interest rates and several control variables on the credit gap. By using a smooth transition regression (STR) estimation, we will find the threshold level of the Central Bank interest rate. Then we can compare the effect of the Central Bank interest rate on the credit gap when the Central Bank interest rate is below and above the threshold level. The empirical findings of this study indicate that the Central Bank interest rate has a positive and significant effect on the credit gap. This shows that an increase (decrease) in Central Bank interest rate results in an increase in the credit gap, in other words, an increase in the Central Bank interest rate increases financial instability. Next, if we compare the effect of the Central Bank interest rate on the credit gap when it is above or below the threshold level, the effect of the interest rate on the credit gap is greater for the high regime. The exchange rate has a significant influence on the credit gap, with a positive direction for the high regime but a negative direction for the low regime. Meanwhile, the effects of economic growth, inflation, and money per GDP on the credit gap are negative for the high regime but positive for the low regime. Furthermore, all are significant at the 1% level, except for inflation in the low regime, where the effect is significant at the 10% level.

The remainder of this paper is structured as follows. Section 2 discusses the literature review on the credit to GDP gap and previous research conducted upon the determinants of credit growth while section 3 describes the data set used for the empirical analysis and discusses the methodological approach. The fourth section presents the results of smooth transition regression and the fifth section explores the results. Section 5 is the conclusion and recommendations.

2. Literature Review

In this paper, we use the credit to GDP gap as a proxy for financial stability. Borio and Lowe (2002) and Alessi and Detken (2018) stated that the credit boom is the core of a financial crisis. Borgy et al. (2009), Schularick and Taylor (2012), and Kim and Mehrotra (2018) provide evidence that excessive credit growth is a signal of a financial crisis. The credit to GDP gap is defined as the difference between the aggregate credit to GDP ratio and its long-run trend.

To calculate the long-run trend of the credit to GDP ratio, we use the Hodrick-Prescott (HP) filter. In the HP filter, the series credit to GDP ratio (y_t) is divided into two parts, namely: trend (g_t) and cycle (c_t), in other words, $y_t = g_t + c_t$. The HP filter is obtained by minimizing the following equation:

$$\sum_{t=1}^{T}(y_t - g_t)^2 + \lambda\sum_{t=1}^{T}\left[(g_{t+1} - g_t)(g_t - g_{t-1})\right]^2$$
$$\text{Subject to: } \{g_t\}_{t=1}^{T} \quad (1)$$

where λ is the smoothing parameter and the value can be selected.

According to Drehmann and Tsatsaronis (2014), there are two advantages to using HP filters in obtaining a credit gap; namely the availability of filter stability as new data, and there is a structural break that affects the filter results. The first issue is related to the "end point problem", meaning that the long-term trend changes whenever new observations become available and, in some cases, trends can change dramatically if the new observations are too severe. One solution to this problem could be using a double-sided HP filter methodology which requires a future credit-to-GDP value. Drehmann and Tsatsaronis (2014) suggested that although policymakers can use some sophisticated estimation methodologies, two-sided filters will not be able to outperform one-sided filters. Another issue is the "starting point problem", which occurs when a time series is too short. A rule of thumb is that the credit to GDP gap can only be used as an indicator if data is available for more than 10 years. Based on this, Drehman and Tsatsaronis (2014) confirmed that if the time period is more than 10 years, the "starting point problem" has almost no effect.

Several previous studies related to the relationship between interest rates and credit growth, such as Thaker et al. (2013), Akinlo and Oni (2015), and Shingjergji and Hyseni (2015). Thaker et al. (2013), examined the role of macroeconomic variables on credit growth in Malaysia for quarterly data for the period 1991-2011. By using the cointegration test and vector error correction model (VECM), they conclude that interest rate, inflation, and GDP make a positive contribution to credit growth. Akinlo and Oni

(2015) analyzed the dominant factors affecting credit growth in Nigeria for the period 1980-2010 using error correction model estimation. Their findings show that money supply and inflation have a positive and significant impact on credit growth. Whereas, economic growth and CB interest rate have a negative effect on credit growth. Shingjergji and Hyseni (2015) analyzed the influence of macroeconomic factors, such as GDP growth, inflation, interest rate, and unemployment on credit growth in Albania for quarterly data for the period 2002 to 2013. They concluded that GDP growth and inflation had a positive correlation with credit growth; while, interest rates and unemployment have a negative relationship with credit growth.

Several studies have examined macroeconomic variables on credit growth. Khamis and Iossifov (2009) analyzed the macroeconomic factors that influenced credit growth in Sub-Saharan Africa for the period 1997-2007. In their research, they found empirical evidence that GDP per capita, nominal interest rate, and money supply were the main driving factors for bank credit growth. Guo and Stepanyan (2011), examined credit growth using panel data for 38 emerging countries for quarterly data for the period 2002-2010. In their research, they divided their sample period into before and after the crisis. Their findings include, among other things, that economic growth has a positive effect on credit growth. Tan (2012), identifies the factors that influence credit growth in the Philippines for the period 2002 Q4 to 2010 Q4. In his research, he ascertained the fact that credit growth in the Philippines was greater for consumption credit than for investment credit. His research concludes that macroeconomic variables for instance inflation and economic growth have a positive influence on credit growth.

Imran and Nishat (2013), identified factors that influence credit growth in Pakistan using annual data for the period 1971 to 2010. Their results demonstrate that economic growth and the exchange rate have a positive and significant effect; however, inflation has a positive effect although it is not significant. Saito et al. (2014) studied the factors that influence bank credit for three different groups, namely: OECD countries, BRIC countries, and Latin American countries for the period 2004 to 2010. For all samples, they found empirical evidence that inflation, crisis, and the market capitalization of firms have a positive and significant impact on bank credit. Specifically, for OECD countries, credit is positively and significantly influenced by private consumption, international trade, and market capitalization. For BRIC countries, bank credit is positively influenced by investment, international trade, and market capitalization but is negatively affected by economic growth. As for LAC, international trade affects credit positively though inflation and economic growth negatively affect credit.

Awdeh (2016) investigated the factors that influence credit growth in Lebanon using the data for 34 banks from the period 2000 to 2015. The results of his study indicate that economic growth and inflation have a positive effect on credit growth. Whereas, the interest rate has a negative effect on credit growth. Ivanovic (2016), conducted research related to credit growth in Montenegro using micro-level data. In his study, he used data from 11 commercial banks with quarterly data from 2004 to 2014. He found evidence that economic growth has a positive and significant impact on credit growth both before and after the financial crisis. Gbenga et al. (2019) examined the factors affecting bank credit in Nigeria for the period 2000 to 2017. In their study, they concluded that the money supply has a positive and significant effect on credit supply. An additional finding from their study is that there is a positive relationship between credit supply and the rate of economic growth.

3. Data and Methodology

3.1. Data

This study uses time-series data for Indonesia with quarterly data from 1976 to 2019. We use secondary data obtained online from the official publication of the World Bank's Global Financial Development Database and the International Financial Statistics published by the IMF. The credit gap or credit to GDP gap is defined as the difference between credit to GDP and its long-term trend. According to Borio and Lowe (2002), the credit gap is an early warning indicator of banking crises.

Central Bank rate is the interest rate set by Bank Indonesia as a reference rate for commercial banks in extending bank credit and expressed as a percentage (%). The Central Bank rate is assumed to have a negative effect on bank credit because the Central Bank rate is the interest rate used as a reference for commercial banks to make decisions in determining the loan interest rate to be distributed to parties requiring funds. If the Central Bank rate rises indirectly, the interest rate will also increase, causing credit extended to decrease due to high interest rates.

We add several control variables that significantly affect the credit gap according to previous studies. The exchange rate is the exchange rate of the rupiah (IDR) against the US dollar; an increase in IDR to USD suggests depreciation, while a decrease in IDR to USD is an appreciation. According to research by Bruno and Shin (2014) and Ha (2019), the exchange rate has a negative effect on the credit gap. We follow Herrero and Del Rio (2003) and Camba Jr and Camba (2019), to examine the effects of economic growth on the credit gap. Economic growth is defined as an increase in real GDP for the current year compared to last year. The next variable control that affects credit growth is inflation (Guo & Stepanyan, 2011; Le & Nguyen, 2020). Inflation is the change in the current consumer price index from the previous

period. We predict that inflation has a positive effect on credit per GDP because an increase in inflation will increase the need for credit. The last control variable is money per GDP. According to Gbenga et al. (2019), money per GDP has a positive effect on the credit gap due to the increasing demand for credit.

3.2. Stylised Facts on Central Bank Rate and Credit Gap in Indonesia

Figure 1 illustrates the relationship between the Central Bank rate and the credit gap in Indonesia for the period 1976 to 2019. From 1978 to 1979, there was an increase in the Central Bank rate from 7.29% to 13.23% or virtually 6% resulting in a credit gap increase of 0.4%. From 1981 to 1982, when the Central Bank interest rate increased from 16.26% to 17.24%, it resulted in an increase in the credit gap by 4.3%. From 1998 to [999, the Central Bank interest rate decreased from 62.79% to 23.58% resulting in a reduction in the credit gap by 55%. However, from 2014 to 2015, the Central Bank interest rate decreased from 7.56% to 7.5% which resulted in a reduction in the credit gap by 0.5%.

From the data above, we can see that when the Central Bank interest rate is above average, the increase (decrease) in the interest rate is followed by an extremely large change in the credit gap. Conversely, when Central Bank interest rates are below the average, these changes in Central Bank interest rates do not trigger large changes in the credit gap. This is because when the Central Bank interest rate is high (above the average), the elasticity is large, which means that changes in interest rates will respond with a higher change in the credit gap. Conversely, when Central Bank interest rates are low, these low rates do not result in a significant change in the credit gap.

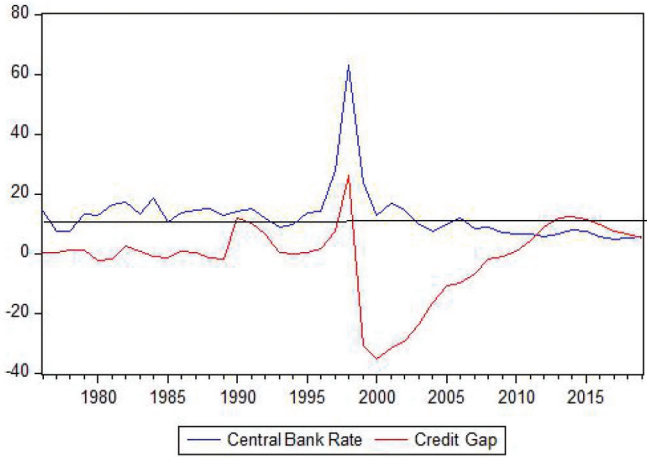

Figure 1: Central Bank Rate and Credit

3.3. Econometrics Methodology

The econometric methodology in our model is the multiple regression equation model using the smooth transition regression (STR) model, which is a non-linear estimate developed by Terasvirta (2009). STR model is part of the state-dependent model, which is a local linearization of general nonlinear specifications. Data generating process (DGP) is a linear process that switches between a number of regimes according to rules; regimes are characterized as a continuous function of predetermined variables, so that interactions between variables are allowed, as well as intermediate states between extreme regimes. This parameterization makes it possible to capture different types of behavior that the linear model cannot characterize in a precise way. Additionally, once the state is given, the model is locally linear, which involves an easy interpretation of local dynamics.

$$y_t = \varnothing_0' x_t + [\varnothing_0' x_t] G(Z_{t;\gamma,c}) + \varepsilon_t \quad (2)$$

where *yt* is the credit gap as the dependent variable; *xt* is the vector time-varying explanatory variable and *εt* is the error term.

G(*Zt;γ,c*) is a transition function in which the value is between 0 and 1. This makes the coefficients of the STR model range between ∅0 and ∅0′ + ∅1′, for the low and high regimes. Zt is the threshold variable; γ is a slope between the low and high regimes and c is the threshold parameter. The transition function follows the logistic specification function:

$$Z_{t;\gamma,c} = (1 + \exp(-\gamma \prod_{j=1}^{m} (Z_t - c)))^{-1} \quad (3)$$

with $\gamma > 0$ and $c_1 < c_2 < \ldots < c_m$

This study uses particular macroeconomic variables which influence the credit gap as described in the empirical results above. Thus, our model is described as follows:

$$\begin{aligned} Credit\ Gap_t = {} & \alpha_0 + \alpha_1 Central\ Bank\ Rate_t \\ & + \alpha_2 Exchange\ Rate_t + \alpha_3 Growth_t \\ & + \alpha_4 Inflation_t + \alpha_5 Money\ per\ GDP_t \\ & + (\alpha_6 Central\ Bank\ Rate_t \\ & + \alpha_7 Exchange\ Rate_t \\ & + \alpha_8 Growth_t + \alpha_9 Inflation_t \\ & + \alpha_{10} Money\ per\ GDP_t) G(Z_{t;\gamma,c}) + \varepsilon_t \end{aligned} \quad (4)$$

Before performing regression for non-linear models, the first step that must be conducted is the linearity test is to check whether the non-linear model is better than the linear model or vice versa. In the linearity test, if the null hypothesis H0 is $\beta_0 = \beta_1$ or there is no difference between the linear model and the non-linear model, while H1 is $\beta_0 \neq \beta_1$ or there is a difference between

the linear model and the non-linear model. By replacing G(Zt;γ,c) in equation (4) with a first-order Taylor expansion where γ = 0; then, equation (4) becomes a linear model as follows:

$$\begin{aligned} Credit\ Gap_t = {} & \alpha_0 + \alpha_1 Central\ Bank\ Rate_t \\ & + \alpha_2 Exchange\ Rate_t \\ & + \alpha_3 Growth_t + \alpha_4 Inflation_t \\ & + \alpha_5 Money\ per\ GDP_t + \varepsilon_t \end{aligned} \quad (5)$$

4. Empirical Results

4.1. Descriptive Statistics

Table 2 shows the variables used in this study for quarterly data from 1976 Q1 to 2019 Q4. Regarding the credit gap, it can be seen that the minimum value is -37,600 and the highest is 57,900. Furthermore, the Central Bank policy rate data is also interesting and requires analysis, where a minimum value of 4.25% occurred in 2017 Q3 and a maximum value of 62.79% occurred in 1998 Q1-1998 Q4, during the economic and financial crisis. An additional fact relates to the exchange rate variable which is converted in the form of a logarithm. In general, the average is 7.9797, with a maximum of 9.6093 and a minimum of 6.0283.

In terms of economic growth data, it can be noticed that the average economic growth achieved by Indonesia is relatively high, about 5.4874%. The maximum economic growth was 9.8801% (1980, Q4) and the minimum economic growth was -13.12679 (1998, Q4). Concerning inflation, the average inflation in Indonesia during the study period was 15,5391, with a minimum value of 0.5957 and a maximum of 100.55. The money per GDP data shows that the average growth rate in Indonesia is 34.105%. The highest ratio of the money supply to GDP was 57.261% and the lowest was 12.186%.

4.2. Linearity Test

In this study, we use the Log-likelihood test to confirm whether the non-linear model is better than the linear model or vice versa. The formula for the Log-likelihood test is as follows:

$$\text{LR Test} = 2^* [Lu - Lr] \quad (6)$$

Lu is the log-likelihood value of the no-linear model, while Lr is the log-likelihood value of the linear model.

From the regression results of equations (4) and (5), we obtain Lu of -621.06 and Lr of -630.98. Therefore, we obtain an LR ratio of 19.84. The critical value in the table of probabilities $\chi 2$ (8) with a significant level of 5% is 15.51. From these results, we can see that the LR ratio value is greater than the $\chi 2$ statistic. Hence, we reject the null hypothesis at a 5% level. These results indicate that the non-linear model is better than the linear model.

4.3. Result of Smooth Transition Regression

In Table 2, we can see the results of regression using a smooth transition estimation for the independent variables in the credit gap. All independent variables which consist of Central Bank policy rate, exchange rate, inflation, economic growth, and money per GDP have a significant effect on the credit gap. Likewise, the threshold level and slope between regimes are significant at a 1% level. The threshold level of the Central Bank policy rate is 2.1036, meaning that if the Central Bank policy rate is above 2.1036 it is a high regime. However, if the Central Bank policy rate is less than or equal to 2.1036 it is a low regime. The value of the smooth transition between regimes is -0.3106 and is significant at a 1% level.

The Central Bank policy rate has a positive and significant influence on the credit gap, both for high and low regimes. The exchange rate has a significant influence on the credit gap, with a positive direction for the high regime and a negative for the low regime. However, the effects of economic growth, inflation, and money per GDP on the credit gap are negative in the high regime but positive in the low regime. All are significant at a 1% level, except for inflation in the low regime, where the effect is significant at a10% level. Meanwhile, we can also see the results of the coefficient of determination (r-square) with an R-square value of 0.5966. This confirms that all independent variables are able to explain the variation in the change in the credit gap by 59.66%, while the remaining 40.34% is explained by variations in other variables that are not included in the model in this study.

Table 1: Descriptive Statistics

Variable	Mean	Std Dev.	Min.	Max.
Credit Gap	-1.9017	15.794	-37.600	57.900
CB Rate	12.547	8.7215	4.2500	62.790
Exchange Rate	7.9797	1.2732	6.0283	9.6093
Growth	5.4874	2.9316	13.127	9.8801
Inflation	15.539	15.812	-0.5957	100.55
Money per GDP	34.105	13.269	12.186	57.261

Table 2: Estimation of Smooth Transition Regression

Variable	High Regime	Low Regime
CB Rate	6.0117** (2.9639)	1.2892*** (0.2556)
Exchange Rate	10.638*** (2.2685)	-6.7724*** (0.8239)
Growth	-6.7742*** (1.9826)	3.0206*** (0.3159)
Inflation	-0.9975* (0.6031)	0.2506*** (0.0779)
Money	-1.3465*** (0.3721)	0.1979*** (0.1714)
Threshold (c)	2.0136***	
Slope (γ)	-0.3106***	
R^2	0.5966	

Notes:
1. The dependent variable is Credit Gap.
2. Threshold variable is Central Bank Policy Rate.
3. Standard errors are in parentheses.
4. The symbols *, **, *** denote statistical significance at the 10%, 5% and 1% level.

5. Discussion

In general, the estimation results of the effect of the Central Bank policy rate, exchange rate, economic growth, inflation, money per GDP on the credit gap are very good. Except for inflation in the high regime, all independent variables appear to have a significant effect at a 1% level on the credit gap. Our estimation reveals that R^2 is 0.5966. This indicates that the variation in changes in the dependent variable can be explained by around 59.66% by variations in changes to the independent variable. Thus, the ability of the independent variable in explaining the dependent variable is 59.66%. Meanwhile, the remaining 40.34% is explained by variations in other variables which are not included in the model

In this study, we find evidence that the Central Bank policy rate has a positive effect on the credit gap, meaning that if there is an increase (decrease), the Central Bank policy rate causes an increase (decrease) in the credit gap. This means that if there is an increase of 1% in the Central Bank policy rate, there will be an increase in the credit gap of around 6% in the high regime and approximately 1.3% in the low regime. This finding is in line with previous studies, such as Akinlo and Oni (2015) and Kim and Mehrotra (2018). The reason for the positive influence of the Central Bank policy rate on the credit gap is because the Central Bank policy rate is a reference for commercial banks in determining loan interest rates. Therefore, when the Central Bank policy rate increases, the credit interest rate will automatically increase. As a result, it triggers the bank to increase the credit it provides because the profits received by the bank are increasing. The results of this study contradict the findings of Hoffman (2001), Kiss et al. (2016), and Shingjergji and Hyseni (2015), which state that interest rates have a negative relationship with credit growth.

Next, we analyze the effect of the exchange rate on the credit gap. For the high regime, the exchange rate has a positive effect on the credit gap with a coefficient of 10,638. Moreover, it is significant at a 1% level. This means that a 1% depreciation of the exchange rate increases the credit gap by 10,638% when the Central Bank policy rate is above its threshold. This result supports the previous research conducted by Guo and Stepanyan (2011) and Imran and Nishat (2013). In contrast, with respect to the low regime, the exchange rate has a negative effect on the credit gap with a coefficient of -6.7724. Furthermore, it is significant at a 1% level. This means that a 1% depreciation of the exchange rate reduces the credit gap by 6.7724% when the Central Bank policy rate is below its threshold. This finding is in line with the previous research conducted by Bruno and Shin (2015). The main reason for a decrease in the credit gap when the exchange rate increase is the principle of the risk-taking channel, where an appreciation of the exchange rate will increase credit growth.

The next variable is economic growth. We find that for the high regime, economic growth has a negative effect on the credit gap with a coefficient of -6.7742. It is significant at a 1% level. This indicates that an increase in the economic growth of 1% leads to a reduction in the credit gap by 6.7742% when the Central Bank policy rate is above its threshold. This result supports the previous research conducted by Greenwald and Stiglitz (2004) and Saito et al. (2014). The main reason for the decrease in the credit gap when the economic growth increase is because the increase in economic growth increases people's income so that the public's desire to borrow money from banks decreases, which in turn causes a decrease in credit per GDP. A different opinion is expressed by Greenwald and Stiglitz (2004), who asserted that when economic growth is lower, the Central Bank provides an incentive policy to increase credit supply enabling the economy to grow again.

Conversely, for the low regime, economic growth has a positive influence on the credit gap with a coefficient of 3.0206. Moreover, it is significant at a 1% level. This suggests that an increase in economic growth by 1% reduces the credit gap by 3.0206% when the Central Bank policy rate is below its threshold. This finding supports previous research conducted by Mohanty et al. (2006); Guo and Stepanyan (2011), Tan (2012), and Shingjergji and Hyseni (2015). The main reason for the increase in credit when the economic growth increase

is because the increase in economic growth means that the business cycle is high. Therefore, investment increases and requires additional capital from banks, increasing credit. Another reason related to the positive relationship between economic growth and credit growth was put forward by Kiss et al. (2006). They asserted that an increase in economic growth will increase expectations of an increase in income and profits in the future, improve financial conditions in the private sector, increase demand for credit and finally, increase credit growth.

A further finding from this research is related to the effect of inflation on the credit gap. We find that for the high regime, inflation has a negative effect on the credit gap with a coefficient of -0.9975 and that it is significant at a 10% level. This indicates that an increase in inflation of 1% reduces the credit gap by 0.9975% when the Central Bank policy rate is above its threshold. This result supports previous research conducted by Warnock and Warnock (2008), Saito et al. (2014), and Sethi et al. (2019). Inflation is a reflection of monetary instability. Thus, when there is an increase in inflation there will be a decrease in credit sources or a decrease in credit supply so that the credit gap decreases. Kiss et al. (2006) stated that when interest rates are high, households and firms will not acquire long-term credit, which results in a decrease in the nominal credit they receive.

Conversely, for the low regime, inflation has a positive effect on the credit gap with a coefficient of 0.2506. Likewise, it is significant at a 1% level. This means that an increase in inflation of 1% leads to an increase in the credit gap by 0.2506% when the Central Bank policy rate is below its threshold. This finding supports previous research conducted by Guo and Stepanyan (2011), Tan (2012), and Shingjergji and Hyseni (2015). The principal reason for the positive relationship of both variables is that the increase in inflation reflects an increase in prices, thereby increasing demand for credit, which in turn increases credit growth.

The last variable in this study is money per GDP. We find that for the high regime, money per GDP has a negative effect on the credit gap with a coefficient of -1.3465. Additionally, it is significant at a 1% level. This signifies that an increase in money per GDP of 1% reduces the credit gap by 1.3465% when the Central Bank policy rate is above its threshold. This result supports previous research conducted by Khamis and Iossifov (2009). In contrast, regarding the low regime, money per GDP has a negative effect on the credit gap with a coefficient of 0.1979. Moreover, it is significant at a 1% level. This signifies that an increase in money per GDP by 1% reduces the credit gap by 0.1979% when the Central Bank policy rate is below its threshold. This result supports previous research conducted by Gbenga (2019) and Akinlo and Oni (2015). The main reason for an increase in the credit gap when the money per GDP increases is because an increase in money per GDP causes a price increase, increase in profit, increase in total output, and finally, an increase in demand for credit.

6. Conclusion and Recommendations

This study established that there is a non-linear relationship between the Central Bank policy rate and the credit gap. All independent variables consisting of Central Bank policy rate, exchange rate, economic growth, inflation, and money per GDP have a significant effect on the credit gap in Indonesia when the Central Bank policy rate is above or below the threshold level. These results, among others, have been consistent and support the results of previous studies on the factors that influence credit growth.

The results of this study produce several recommendations. First, it is essential to keep the Central Bank interest rate low and stable so that the role of banking intermediation remains stable and conducive to strengthening financial stability. Second, strengthening the rupiah exchange rate to maintain financial stability. Third, economic growth continues to grow and remains stable to support national financial stability. Fourth, continue to maintain inflation rate stability so that the real economy remains stable. Fifth, maintaining the stability of the money supply in accordance with the needs of the economy to maintain financial stability.

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