

# The Effect of Market Intervention Policy through Capping Rate on Credit Growth

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## The Effect of Market Intervention Policy through Capping Rate on Credit Growth (Keberkesanan Dasar Intervensi Pasar Melalui Kadar Penetapan ke atas Pertumbuhan Kredit)

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### ABSTRACT

This research aims to analyze the impact of capping policy on the credit growth in the banking sector and the potential risk of insolvency. We use the dynamic panel data method on Indonesian data over January 2006 - November 2018. The results shows that monetary policy through reference interest rate (BI Rate) maintains the rate stability under normal conditions. However, in a state of shock, it shows that the policy was no longer effective in reducing the interest rate that deviates market far above the BI Rate. Therefore, a more 'repressive' policy is needed for the economy to continue to grow. Furthermore, the results show a policy mix between macroprudential (Central Bank) and micro-prudential (Financial Services Authority) authorities through the interaction between the BI Rate and capping. This is effective for maintaining interest stability in supporting target credit growth and minimizing risk of insolvency. The results also show that the direct interaction between macroprudential regulation and micro-prudential policy contribute to reducing the occurrence of credit shocks. Therefore, the coordination mechanism between BI and Financial Services Authority in determining interest rates needs to be regulated in a 'rigid' manner, in order to create synergies between monetary targets and macroeconomic conditions.

**Keywords:** Market intervention policy; capping rate; credit growth; panel data method

### ABSTRAK

Kajian ini bertujuan untuk menganalisis kesan penggunaan dasar penetapan kadar faedah ke atas pertumbuhan kredit di sektor perbankan dan potensi risiko insolvensi. Kami menggunakan kaedah data panel dinamik ke atas data Indonesia dari Januari 2006–November 2018. Hasil analisis data menunjukkan bahawa dasar monetari melalui kadar faedah rujukan (BI Rate) dapat mengekalkan kestabilan kadar faedah dalam keadaan normal. Walau bagaimanapun, dalam keadaan kejutan, ia menunjukkan bahawa dasar monetari tidak lagi berkesan dalam mengurangkan perang kadar faedah yang menyimpang kadar faedah pasaran jauh di atas Kadar BI. Oleh itu, dasar yang lebih 'menindas' diperlukan supaya pasaran menyesuaikan kadar faedah sekali lagi kepada saiz yang kondusif bagi ekonomi untuk terus berkembang. Hasilnya juga menunjukkan bahawa campuran dasar kadar faedah antara pihak berkuasa makrofizat (BI) dan pengiktirafan mikro (OJK) melalui interaksi antara Kadar BI dan penentuan kadar faedah ke atas jumlah tertentu, adalah berkesan dalam mengekalkan kestabilan kadar faedah dana dalam menyokong pertumbuhan kredit yang dikehendaki dan meminimumkan insolvensi risiko. Hasilnya juga menunjukkan bahawa interaksi langsung antara peraturan makroprudential dan polisi kehematan mikro menyumbang kepada mengurangkan berlakunya kejutan kredit supaya mekanisme penyesuaian antara BI dan OJK dalam menentukan kadar faedah perlu dikawal dengan cara 'tegar' untuk mewujudkan sinergi antara sasaran monetari dan keadaan makroekonomi

**Kata kunci:** Dasar intervensi pasaran; kadar penetapan; pertumbuhan kredit; kaedah data panel

### INTRODUCTION

Over the past two decades, the frequency of financial crises in various countries has increased rapidly along

with significant economic losses. This condition is inseparable from the rampant liberalization and globalization of financial markets, which were heavily promoted in the early 1980s. The Asian economic crisis

of the 1997/98 era and the 2008 global economic crisis have confirmed this. Initially, liberalization was intended to encourage competition in the financial sector with the aim to improve efficiency. According to Mirdala et al. (2015), development of studies and analytical works started due to the economic impact of financial liberalization. In such conditions, prudential policies become increasingly permissive, and needed to keep banks prudent in investing, in order to avoid the pressures of crisis. Meanwhile, wealth distribution effectiveness and sharing of external risks influence development and sustain economic stability. Also, prudent investment policies cannot be implemented when the interest rate competition is massive in the liberalization era. From the research conducted by Hellmann et al. (2000), it is known that there is a clear theoretical relationship between liberalization and the moral hazard behavior of banking actors. In fact, competition to drive true efficiency is only effective outside the financial sector. In this sector, the competition only raises interest rates, in order to obtain or maintain depositors. The impact of this is that the cost of funds tends to increase and only encourage moral hazard behavior by making speculative and risky investments.

According to Hellmann et al. (2000), there are three factors why financial market liberalization is considered as the cause of increasingly frequent crises. Firstly, it reduces entry barriers in the financial industry. Therefore, many new institutions have emerged with increased competition and triggered interest rate competition. Secondly, it promotes relaxation of prudential provisions that were previously applied to the banking industry. This condition raises many new activities that were previously prohibited, such as derivative transactions and other structured products. Thirdly, financial market liberalization opens up the potential for speculative banking activities to obtain high yields through excessive risk-taking, in order to compensate for high interest rates as a result of competition. In line with this statement, Demirguc-Kunt and Detragiache (1998) stated that financial liberalization drives a significant increase in interest rates and it is systematically related to crisis.

Roy and Kemme (2020) found that all the short-term shifts in response to financial reform from the 1980s, capital inflows from the early 1990s, and people's perceptions of ever-increasing asset prices in the late 1990s and early 2000s resulted in the 2007–2009 crisis. These series of phenomena raised questions regarding the effectiveness of monetary policy adopted by macroprudential authorities in controlling interest rates in the liberalization era. When such conditions become more massive, financial services and supervisory authorities will increasingly be limited in effectively implementing prudential policies. Therefore, to control the increase in interest rates, many countries subsequently implemented repressive policies through

capping of interest rates. The aim is to achieve the ability to control rate volatility, reduce speculative behavior, maintain financial system stability, stimulate credit growth prudently, and encourage economic growth.

In relation to the formulation of the problem, this research aimed to analyze the effect of monetary policy and the implementation of capping policies on the development of credit in the banking sector, and the potential insolvency. In addition, this research was intended to prove that interest rate instruments are basically not only the domain of macroprudential authority, but can also be used as a micro-prudential tool by the financial services supervisory authority. The World Bank (2014) listed as many as 76 countries that are enforcing restrictive policies through capping. One of the reasons for capping the rate policy in some countries has essentially proven successful at minimizing this disruptive market stealing effect, and being able to dampen it by keeping banks back from excessive-high interest rate.

In September 2014, the effective policy of capping in Indonesia was implemented based on a significant increase in the movement of the fund rate. The rise in the Fund's pace was partly influenced by global economic uncertainty following the taper tantrum. Meanwhile, at the end of 2013, the Fed started reducing its expansive strategy by minimizing quantitative easing. These conditions promoted intense competition for access to funding sources and market liquidity pressures that forced the fund rate to a point that is no longer acceptable at 400 bps – 500 bps above the BI rate, which reached 7% in mid-2014 (Indonesian Banking Statistics 2014).

Maimbo and Gallegos (2014) found that 79 countries are currently enforcing lending rate restriction policies and concluded that those restrictions are not always successful in achieving their desired objectives. Also, in some nations, this strategy has led to banks' reluctance to crunch credit because it is deemed to lack the appropriate incentives. Meanwhile, other data indicated that some countries have successfully pursued this authoritarian strategy for a long time. In fact, Indonesia has placed interest rate limits on third party funds (DPK) banks via FSA in the last four years. Nevertheless, this policy differs significantly from the 79 countries under study that placed restrictions on the lending rates. Hence, given the emergence of numerous theories and controversies, the implementation of capping is always interesting and becomes a new research area, especially in Indonesia.

This research aimed at understanding the relationship between the policy of curtailing interest rates against banking sector credit growth, and the risk of insolvency. Also, work variables influencing credit growth and risk have been inseparable from macroeconomic conditions, monetary policy, and the transition of interest rates from the financial services sector. As far as the authors are aware, there are few researches that examines

the combination of monetary policy control and the implementation of coercive policies such as capping in the banking sector. Previous studies focused mostly on partial relationships between macroeconomic variables such as monetary policy or micro-variables like the growth of the banking sector (Soedarmono et. al 2013; Demirguc-Kunt & Detragiache, 1998).

In the era of liberalization, which glorified the market mechanism, every policy of authority that was interventional such as the capping of interest rates, was very unpopular and caused criticism. Although it has been proven to reduce fund rates, further research still needs to be conducted on the following matters: (I). Is there an influence of monetary policy on credit development and bank credit risk in Indonesia? (II). Is there an influence of the funds capping policy on the development of credit and bank risk? (III). Is there an influence of monetary policy and capping policy of fund interest rates on the development of credit and bank risk? This research is divided into 5 (five) parts. Part 1 introduced the urgency. 2 explained and developed the theory from the literature review. 3 explained the research method and analysis of the hypothesis. Finally, Part 4 and 5 showed the results, discussed the findings as well as the conclusion.

#### LITERATURE REVIEW

Karl and Fair (2001) and Miskhin (2016) analyzed interest rates from the perspective that it is the payment of several rewards on an annual basis from a loan in the form of a percentage. In terms of the fund owner behavior, when the rate increases, the owner tends to keep it in the bank with a motive of gaining a favorable return. Also, Warjiyo and Agung (2002) analyzed every transmission line of monetary policy in the Central Bank and found that the 1998 post-crisis direction effectively influenced the economy like interest rates, expectations, and bank loans. Besides, research by Wang and Lee (2009) as well as Houghton and Iglesias (2012) using data from the United States (US) and several countries in Asia found that transmission through US interest-rate lines effectively affects deposit rates. The results were confirmed by Tai et al. (2012), which found that the loan interest rate transfer mechanism is lower than the deposit rate

In this position, the public demand to hold cash tends to decrease, and prefers to place it in the form of banking portfolios (deposits and savings). Also, interest rate restriction policies have been common in many parts of the world. Maimbo and Gallegos (2014) found that the implementation of lending rate restriction policies has become a 'common practice' and widespread in many regions of the world. In fact, at least 79 countries have adopted the policies. However, in general, capping is more targeted at credit rates. A project carried out by

Koch (2015), noted that there is a positive relationship between capping credit deposit rates and testing using the same approach tailored to macroeconomic conditions, financial system environment, and the banking structure.

More recent research on the phenomenal policy of capping was conducted by Koch (2015). The purpose was to test the interaction between the limiting deposit rates and the transmission of monetary policy, especially related to its effect on credit development and the effectiveness of monetary policy transmission. Therefore, increasing competition for depositors through the provision of high-interest rates will erode banking profitability and encourage the emergence of moral hazard incentives to take excessive risks at a time when the government is providing deposit guarantees. Related to the need to intervene authorities in conditions of interest rate competition, research by Fernandez et al. (2016) found that the stability of the banking sector is increased when competition between banks is limited by regulators.

The inability of the monetary authority to reduce crisis shows that there have been anomalies and paradoxes in the economic theory that are currently being referred to in various crisis management policies (Miskhin 2011). The study of monetary transmission initially referred to the role of money in the economy, as first explained by Fischer et al. (1997) in the Quantity Theory of Money. This theory states that there is a direct and systematic relationship between money supply growth with inflation and real output. However, in line with the development of financial product and service sector innovation, there has been fundamental changes in the pattern of financial transmission. This pattern can no longer be explained by only monetary transmissions through money channels, interest rates, or exchange rates, but also by banking credit channels and public expectations.

Stiglitz and Greenwald (2003), for example, asserted that the key to effective transmission of monetary policy is more dominantly seen in the role of demand and supply of funds and credit. Therefore, it is important to understand the role of financial sector, especially banking, as an intermediary institution. The mechanism that occurs in the money market, both funds and credit, cannot be compared to the goods market. Hence, it cannot be assumed that the interest rates occurring in the market automatically balance the amount of demand and supply of credit. This new paradigm is what Stiglitz and Greenwald (2003) tried to introduce as credit lines and interest rates in monetary economic theory. The paradigm refers to the argument that the emergence of problem loans is a risk that needs to be borne by the bank regardless of the causal factor, whether caused by debtors who have experienced business failure or because of the bank's prudence in channeling credit. Therefore, an understanding of the



behavior of financial institutions and customers (both funds and credit) greatly determines the effectiveness of monetary policy transmission to be carried out by the financial authority.

Furthermore, in response to the rapid financial services and changes in the structure of the economy, there are at least five channels that are often discussed in monetary economic theory (Mishkin 1995, 2000; Bank for International Settlement 1997; Kakes 2000 De Bondt 2000; Bofinger 2001), which are direct monetary, interest rate, asset price, credit, and expectations channels. They then become the reference and thought line of this research, as shown in FIGURE 1.

Koch (2015) explicitly studied the effect of US capping, popularly referred to as ‘Regulation Q’ by conducting a cross-sectional analysis of the impact on credit channels. The results showed the effect of deregulation of capping lending rates (Regulation Q), which indicated that monetary policy transmission through banking credit lines decreased significantly.

The results of estimates related to cross-sectional heterogeneity also showed that larger, liquid, and strong capital have lower average credit growth at the level of each bank (Kishan & Opiela 2000; Kashyap & Stein 2000). Furthermore, Koch’s results (2015) support earlier studies (Burns 1960; Moore & Zarnowitz 1987; Blanchard & Simon 2001; Cogley & Sargent 2001; Stock & Watson 2002; Bernanke 2004; Taylor 2007), which suggested that direct interaction between macro-prudential regulation and micro-prudential policy is effective in reducing credit shocks.

Alper et al. (2019) showed the opposite result, based on empirical studies in Kenya, and the capping credit was introduced in September 2016. The controls were intended to minimize borrowing rates, widen access to credit, and raise investment returns. Furthermore, the study showed that what was meant had the opposite impact of the law on interest rate controls. In particular, it contributed to a shortage of credit for micro, small and medium-sized enterprises, a shrinking of the small banks’

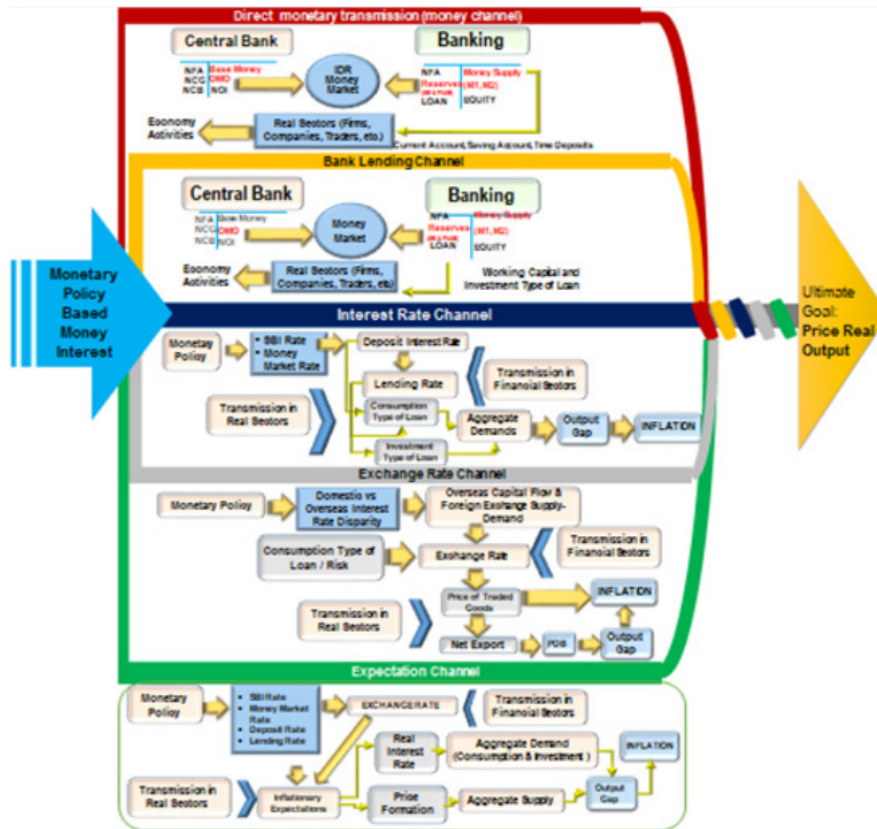


FIGURE 1. Research framework  
Source: De Bondt (2000)

16 loan book, and a decline in financial intermediation. In addition, the analysis found that interest rate controls have limited the signalling impact of monetary policy.

## METHODOLOGY

8 As stated in the previous discussion, the purpose of this research was to examine the impact of capping on the development of credit in the banking sector and the potential bank risk. The dependent variable is the development of bank credit and insolvency risk. This research used individual panel data based on

commercial bank report submitted to the Financial Services Authority (FSA) from January 2006 to Nov 2018. Furthermore, the data were analyzed using the GMM panel estimator analytical model. Also, the GMM data panel approach was used to test the robustness of the research model, and the data were processed using the STATA software. The basis of modeling used the results of Koch's study (2015) on the impact of interest rate restrictions (deposit ceilings) that were applied in the US from 1933-1980 (regulation Q). Furthermore, the modeling base has been modified and adapted to the needs of research. In principle, the design model was used to analyze the combined effect of monetary policy

TABLE. 1 Research variables and explanations

Variable	Description	Explanation
<i>Dependent Variables</i>		
<i>DLOAN</i>	Bank Credit Growth	DLOAN is a credit development, while GLOAN is an indicator of annual credit development to confirm the degree of confidence in the indicator (robustness)
<i>GLOAN</i>		
<i>Z-SCORE</i>	Risk Bank	Z-SCORE is a banking risk to measure or predict the probability of bank insolvency.
<i>Independent Variables</i>		
<i>SIZE</i>	Natural logs of total bank assets	Used as a proxy for the scale of the bank's business represented by the total assets. 10
<i>EQTA</i>	Equity	It is used as a proxy for bank capital to predict the bank's ability to support credit expansion and as a risk cushion.
<i>CAR</i>	Capital Adequacy Ratio	It is a ratio of comparison between risk-weighted assets and capital. Formula CAR refers to the calculation stipulated by the Basel Committee for Banking Supervision (BCBS) as adopted in FSA/OJK (POJK) regulations on bank capital. This ratio is a proxy for measuring the sensitivity or adequacy of capital in covering the potential risks that will arise for each rupiah of credit given. As with the nominal amount of capital.
<i>It</i>	Net Interest Margin	It is a measure of the comparison between the interest income generated by banks from planting on productive assets (earning assets) and interest costs from sources of funds (including current accounts, savings, deposits) relative to total productive assets. This ratio is used to measure the bank's ability to manage productive assets and generate profit.
<i>INF</i>	Inflation	Inflation is the final target of monetary policy and determines the transmission path to be chosen by the authority. The amount of inflation is selected and is a standard control variable that represents the level of economic stability and determines the direction of a country's macroeconomic policy, and in the microsphere determines the amount of credit supply by banks and demand for credit by companies or debtors.
<i>Course</i>	Exchange Rate	Exchange rate volatility greatly affects the appetite of credit permits and the ability to pay debtors who have credit exposure in foreign exchange. This variable is chosen to test the effect of exchange rates on the effectiveness of monetary transmission through exchange rate paths on other variables, namely inflation that affects credit demand, especially appetite for foreign exchange loans.
<i>GDP</i>	Economic Growth	Real GDP growth is presented in quarterly data, therefore, spline interpolation using Stata software, commonly used in numerical interpolation analysis for low-frequency macroeconomic data.
<i>MON</i>	Monetary Policy	Policies with any path chosen affect macroeconomic conditions and impact the performance of the micro sector, among others, the lending capabilities of the banking sector. The ultimate goal of monetary policy is to maintain rupiah stability, one of which is reflected in the low and stable inflation rate. Exchange rates and inflation were variable controls in the study.
<i>CAP</i>	Capping Fund Interest Rate Policy	The policy of capping interest rates is interventive and greatly affects the interest rate of funds, the number of fund fees, and the risk appetite of banks, especially behavior in the placement of funds, one of which is the amount of credit expansion, in maintaining its margins.

(MON) and fund interest capping (CAP) on credit development. The empirical models of the research design are defined as follows:

$$Y_{i,j,t} = \alpha + \beta_1 Y_{i,j,t-1} + \sum_{i=1}^N \sum_{j=1}^4 \beta_i P_{i,j,t} + \sum_{i=1}^N \sum_{j=1}^3 \beta_i M_{i,j,t} + \sum_{i=1}^N \beta_i MON_{i,t} + \varepsilon_{i,j,t} \quad (1)$$

$$Y_{i,j,t} = \alpha + \beta_1 Y_{i,j,t-1} + \sum_{i=1}^N \sum_{j=1}^4 \beta_i P_{i,j,t} + \sum_{i=1}^N \sum_{j=1}^3 \beta_i M_{i,j,t} + \sum_{i=1}^N \beta_i CAP_{i,t} + \varepsilon_{i,j,t} \quad (2)$$

$$Y_{i,j,t} = \alpha + \beta_1 Y_{i,j,t-1} + \sum_{i=1}^N \sum_{j=1}^4 \beta_i P_{i,j,t} + \sum_{i=1}^N \sum_{j=1}^3 \beta_i M_{i,j,t} + \sum_{i=1}^N \beta_i MON_{i,t} + \sum_{i=1}^N \beta_i CAP_{i,t} + \sum_{i=1}^N \beta_i (MON * CAP)_{i,t} + \varepsilon_{i,j,t} \quad (3)$$

$Y_{i,j,t}$  is the dependent variable of credit development and banking risk with  $i = 1, 2, \dots, N$ ;  $j = 1, 2, \dots, J$  and  $t = 1, 2, \dots, T$ . Furthermore, the independent variable  $P_{i,j,t}$  is the performance control variable of the bank using the variable Total Assets (SIZE), profitability (NIM) and Capital (EQTA). Whereas the indicators  $M_{i,j,t}$  are macroeconomic level control variables using Inflation (INF), Exchange Rate (Course), and Economic Growth (GDP) variables. Also, the main explanatory variable  $MON_{i,t}$  represents the transmission of monetary policy by the central bank (through setting the benchmark interest rate; BI rate), which will affect the condition of the development of credit and the economy at large. The other main explanatory variable is the CAP, which represents capping policy (capping) to test how the impact affects the movement of rates which is an independent variable. Table 1 shows dependent and independent variables.

Equation (1), (2), and (3) were used to test the hypothesis. For this purpose, this study adds an explanatory interaction variable  $MON * CAP$  as an independent variable. Specifically, the empirical model of the interaction between monetary and capping policy on the development of credit in the banking sector is defined as above. Therefore, to measure the development of bank credit, indicators were employed as used by Lepetit and Bouvatier (2008). The indicator is defined IN EQUATION (3.4) as follows:

$$DLOAN_{i,j,t} = \frac{(L_{i,j,t} - L_{i,j,t-1})}{0,5(TA_{i,j,t} - TA_{i,j,t-1})} \quad (4)$$

The equation explains that for each bank  $i$  in period  $t$ ,  $L$  is total bank credit in billion rupiahs, while  $TA$  is total bank assets in billion rupiahs. To check robustness in increasing the degree of confidence in credit development indicators, annual indicators (GLOAN) were also used (as used in the research of Olivero et al., 2011). GLOAN is defined as follows:

$$GLOAN_{i,j,t} = \frac{(L_{i,j,t} - L_{i,j,t-1})}{L_{i,j,t-1}} \quad (5)$$

To measure banking risk, the ZSCORE model was used to measure the probability of bank insolvency. Lepetit and Strobel (2013) modified the ZSCORE measurement and showed that it was the most theoretically accurate in defining the probability of insolvency. The accuracy of ZSCORE from Lepetit and Bouvatier (2008) was shown by comparing their methods with other measurements where the modified ZSCORE has a prediction error for the next year that is smaller than the others. Empirical testing was also presented for banking samples in Europe to prove the accuracy of the modified ZSCORE (Boyd and DeNicolo, 2006; Soedarmono et al., 2013; and Widodo, 2013). It is defined as follows:

$$ZSCORE_{i,t} = \frac{EQTA_{i,t} + MROA_{i,t}}{\sigma_{ROA_{i,t}}} \quad (6)$$

EQTA is the ratio of equity to total assets and MROA is the average return on assets, which is the standard deviation for the entire observation period. As a comparison in measuring bank risk, this research used a non-performing loan (NPL) as a proxy for measuring the amount of risk bank credit.

Before making empirical estimates, computation of several research variables was carried out to test sequential hypotheses with the following stages:

Stage 1: Computing credit development of each bank (DLOAN and GLOAN) and the level of banking risk (ZSCORE and NPL).

Stage 2: Monetary policy, which is proxied by the BI interest rate was observed during the observation period 2006M1-2018M11. The observed developments in bank credit were thought to change (shift) in accordance with alterations in monetary policy or in other variables.

Stage 3: The policy is capping interest rate (CAP) approached by the difference between interest and the BI Rate. There are periods before (2006M1 - 2014M9) and after capping, namely, phase I (2014M10 - 2016M2) and II (2016M3 - 2018M11). In the period after capping, the variable is dummy, where commercial banks that are subject to policy capping (BUKU 4 and 3) are given a value of 0, while those that are not subject to it (BUKU 1 and 2) are given a value of 1.

Stage 4: Estimation of empirical models is the main use of GMM panel data estimator method and the static panel regression model. The data panel processing in this study used the STATA software.

## RESULTS AND DISCUSSION

Descriptive statistics of research variables are presented in Table 2.

The results of data processing generally proved that under normal conditions, both monetary and the policy of limiting interest rates individually can maintain stability, encourage credit growth, and maintain future risk (insolvency). However, in a state of shock, empirical data showed that monetary policy cannot effectively reduce the 'war' of interest rates that deviate market far from the established reference. Therefore, a mix of policies between the two authorities is needed to harmonize macroprudential and microprudential policies. This can be achieved by combining the reference and capping at a certain amount above the reference. This mix has empirically proven to be more effective in achieving interest rate targets and encouraging credit growth.

## IMPACT OF MONETARY POLICY ON BANK LOAN GROWTH

Table 3 showed the results of data processing, and the importance of explanatory variables using statistical t-test methods. The t-test function can be simplified through asymptotic significance tests based on the p-value. Furthermore, the result confirmed that the hypothesis

affects monetary policy on loan growth in banking, which is proxied by BI Rate, and the BI-7 reverse rate has a statistically significant effect on credit growth. This is indicated by the coefficient of the variable MON being positive. Besides, the results of data processing showed that the higher interest rates on policies tend to reduce bank credit growth and increase the risk. Also, empirical data showed that the high BI Rate encouraged an increase in market interest rates, especially deposit. Such conditions increase the cost of bank funds and then be passed to lending rates. Furthermore, the increase in lending rates reduces credit demand, which has an impact on inhibiting growth. Besides, an increase in the lending rates will reduce the capacity to pay debtors, which will in turn trigger problem loans (NPL). As long as this condition continues in the longer term, it will have an impact on bank solvency.

This research is in accordance with previous study by Jimenez et al. (2017), about the impact of macroprudential policy on credit supply cycles. It found that monetary policy has an impact on credit supply and affected the risk of the bank. Moreover, there are at least five channels of transmission that are often articulated in monetary economic theory to respond to rapid financial markets and changes in economic structure (Mishkin 1995; Bank for International Settlement 1997; Kakes 2000; De Bondt 2000; Bofinger 2001).

TABLE 2. Descriptive statistic of research variables

Variable	Definition	Mean	Std Dev	Min	Max
<i>DLOAN</i>	Credit growth (%)	1.3360	3.2571	-11	9.9880
<i>GLOAN</i>	Alternative credit growth (%)	1.3425	2.7329	-9.7945	10.6382
<i>LN(LOAN)</i>	Natural logarithm total credits	15.4236	1.8496	9.6107	20.4779
<i>ZSCORE</i>	ZSCORE Index (%)	13.9155	13.1632	2.20163	181.970
<i>NPL</i>	Risk credit (%)	2.4161	2.0788	0	19.048
<i>MON</i>	BI Rate and BI-7 DRR (%)	7.1016	1.8886	4.25	12.75
<i>CAP</i>	Deposit rate (%) (Book 3 and Book4)	0.8581	2.4984	0	10
<i>SIZE</i>	Natural log total assets	15.9052	1.7956	11.09	20.81
<i>EQTA</i>	Total capital ratio divided by total assets (%)	10.5396	12.1313	0	116.503
<i>ROA</i>	Return on assets (%)	2.2526	1.7082	-6.842	47.09
<i>IT</i>	Net interest margin (%)	5.4832	2.2188	-0.534	18.145
<i>LDR</i>	Loan deposit ratio (%)	79.8658	17.9107	0	132.153
<i>INF</i>	Inflation (%)	6.1755	3.2216	2.41	17.92
<i>Course</i>	Exchange rate (Rp/USD)	10937	1996	8500	15227
<i>GDP</i>	Economic growth (%)	5.4767	0.5904	4.1358	6.8066
Number of banks, N	86	BUKU-1	BUKU-2	BUKU-3	BUKU-4
Government Bank (SOE)		-	-	1	3
Private Public Bank (BUSN)		11	25	15	1
Bank Daerah (BPD)		4	15	4	-
Mixed Bank		-	2	4	-

Sources: Data Proceed (2020).



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TABLE 3. Impact of monetary policy on bank loan growth

Independent Variable	System GMM		
	DLOAN	GLOAN	LN_LOAN
Lag (-1)	0,1732*** -0,0036	0,0806*** -0,0043	0,8122*** -0,0043
SIZE	0,1478*** -0,0277	-0,0095 -0,0121	0,1879*** -0,0042
EQTA	0,0184 -0,0174	-0,0314*** -0,0072	-0,0001 -0,0002
ROA	0,1710*** -0,0368	0,0926*** -0,024	-0,0023*** -0,0004
NIM	0,2234*** -0,0353	0,2122*** -0,0186	0,0095*** -0,0003
LDR	0,0097*** -0,003	-0,0158*** -0,0021	0,0007*** 0,0000
MON	-1,0291*** -0,0355	-0,9860*** -0,0234	-0,0225*** -0,0004
INF	0,1853*** -0,0143	0,2256*** -0,0097	0,0063*** -0,0002
KURS	0,0004*** 0,0000	0,0001*** 0,0000	0,0000*** 0,0000
GDP	0,6398*** -0,1992	0,6401*** -0,0745	-0,0007 -0,0013
C	-8,7186*** -1,8086	1,6925*** -0,5905	-0,2908*** -0,0137
Sum of Bank	86	86	86
Observes, <i>N</i>	13.244	13.244	13.244
R-squared	N/A	N/A	N/A
F-stat: p-val	0,0000	0,0000	0,0000
AR (1): p-val	0,000	0,000	0,005
AR (2): p-val	0,303	0,490	0,767
Hansen-J: p-val	1,000	1,000	1,000

Notes: \*\*\*, \*\*, \* denote significant at significant at 1%, 5%, and 10% of *t*-statistics

Sources: Data Proceed (2020).

#### IMPACT OF CAPPING ON BANK LOAN GROWTH

Table 4 showed that the results of the data processing significantly influenced the growth of bank loans statistically. Also, it can be seen that the coefficient of CAP variable is positive, which means that adoption of the capping policy tends to increase bank credit growth. This condition showed that capping will relatively reduce interest and cost of funds. To be more competitive in terms of credit, the reduction in interest rates on these funds will be followed by a decrease in lending rates, in order to encourage credit demand and improve debtor repayment capacity. With the increasing demand for credit, growth will increase with better credit quality supported by an improved capacity to pay

debtors. This empirical data at the same time confirms the hypothesis impact of capping, which states that it significantly influences credit and insolvency risk. Furthermore, increasing capping threshold can have a double impact, namely an increase in the cost of bank funds and in lending rates, as well as the potential to increase problem loans (NPL).

TABLE 4. Impact of policy of capping interest rate on bank loan growth

Independent Variable	System GMM		
	DLOAN	GLOAN	LN_LOAN
Lag (-1)	0,1788*** -0,0036	0,0761*** -0,0066	0,8196*** -0,0045
SIZE	0,1961*** -0,0277	-0,0209 -0,0137	0,1809*** -0,0044
EQTA	0,0478*** -0,0154	-0,0299*** -0,0083	-0,000 -0,0002
ROA	0,1231*** -0,0187	0,0936*** -0,0215	-0,0022*** -0,0004
NIM	0,2775*** -0,0209	0,2151*** -0,0183	0,0091*** -0,0003
LDR	0,0087*** -0,003	-0,0185*** -0,0022	0,0006*** -0,0001
CAP	0,0022 -0,0069	0,0528*** -0,0031	0,0002** -0,0001
INF	0,0391** -0,0152	0,0659*** -0,0098	0,0027*** -0,0002
KURS	0,0001* 0,0000	-0,0002*** 0,0000	0,0000*** 0,0000
GDP	1,2905*** -0,1397	0,9459*** -0,1209	0,0066*** -0,0012
C	-12,945*** -1,1345	-0,2827 -0,7254	-0,3053*** -0,00167
Sum of Bank	86	86	86
Observes, <i>N</i>	13.244	13.244	13.244
R-squared	N/A	N/A	N/A
F-stat: p-val	0,0000	0,0000	0,0000
AR (1): p-val	0,000	0,000	0,005
AR (2): p-val	0,139	0,315	0,762
Hansen-J: p-val	1,000	1,000	1,000

Notes: \*\*\*, \*\*, \* denote significant at significant at 1%, 5%, and 10% of *t*-statistics

Sources: Data Proceed (2020).

The result of this research is in line with Koch's previous study (2015), which found that the credit supply had a positive effect. Meanwhile, Hellmann, et al. (2000) noted that an alternative strategy of prudential

regulation may be to reduce the deposit rate. Also, with the curtailment of interest rates charged on depositors (customers), competition for interest becomes restricted, reducing the cost of funds, gradually raising the profitability, and eventually increasing the franchise value of the bank.

#### IMPACT OF MONETARY POLICY AND CAPPING ON BANK LOAN GROWTH

After examining the impact of applying monetary policy (macroprudential policy), the author tried to combine the policy variables with capping to test hypothesis 3A that the policies significantly influence bank credit growth. This merger was based on the consideration of the need for harmonization between the monetary authority (Bank Indonesia) and stabilization of the banking sector to suppress the interest rate war.

Based on the regression results, impact of the interaction of monetary and capping policy on the growth of bank credit can be observed. Besides, it can also be seen that the coefficient of the variable MON \* CAP is positive, which means that the interaction between monetary policy and capping will increase the credit growth.

Furthermore, Table 5 showed that the test hypothesis impact of monetary policy and capping have a significant effect on credit and insolvency risk, which are proxied by NPL and ZSCORE dependent variables. The results of the significance of explanatory variables using the t-test method showed that statistically, the MON \* CAP variable has a significant effect on increasing credit (NPL) and insolvency risk (ZSCORE). Furthermore, the coefficient of the variable MON \* CAP is negative towards NPL, which means that monetary policy through the BI Rate will reduce NPL. Meanwhile, the MON \* CAP variable coefficient is positive for ZSCORE, which means that monetary policy through the BI-7DRR interest rate will increase the stability of the banking system.

The findings of this research have important implications. One interpretation of the findings in terms of the contribution of monetary transmission in the era of great moderation validates the theoretical study previously conducted by Mertens (2008). Meanwhile, Jiménez et al. (2017) argued that monetary policy transmission works by affecting the degree of risk for credit decision-making which is a risk-taking path. Although the source of the period is still debated, based on a survey of previous studies (Burns 1960; Moore & Zarnowitz 1987; Blanchard & Simon 2001; Cogley & Sargent 2001; Stock & Watson 2002; Bernanke 2002, 2004; Taylor 2007), there are three alternative explanations. The first is variance in exogenous shocks, and the second is structural changes in the economy

such as innovations in financial markets, better inventory management using information technology, and changing output from goods to services. Furthermore, the third is better monetary policy. From the findings, another alternative explanation is that the direct interaction between macroprudential regulation and micro-prudential policy has a role in reducing the occurrence of credit shocks. Therefore, capping the interest rate does not interfere with monetary policy, but specifically to make the transmission more productive through a balance of the two policies.

TABLE 5. Impact of monetary policy and policy of capping interest rate on bank loan growth

Independent Variables	System GMM	
	NPL	ZSCORE
Lag (-1)	0,9114***	0,8245***
	-0,0232	-0,0223
SIZE	0,062	0,1246*
	-0,1418	-0,0656
EQTA	0,0102	0,1511***
	-0,008	-0,0265
ROA	0,01	-0,0432
	-0,0216	-0,0314
NIM	-0,009	0,1195***
	-0,018	-0,0267
LDR	-0,0072***	-0,0168***
	-0,0015	-0,0035
MON*CAP	-0,0107**	0,0246**
	-0,0053	-0,0114
INF	-0,0035**	0,0250***
	-0,0017	-0,0042
KURS	0,0000***	0,0000***
	0,0000	0,0000
GDP	-0,0088	-0,0398
	-0,0096	-0,0266
C	-0,1867	-1,7432
	-2,3263	-1,7432
Sum of Bank	86	86
Observes, N	13.244	13.244
R-squared	N/A	N/A
F-stat: p-val	0,0000	0,0000
AR (1): p-val	0,000	0,000
AR (2): p-val	0,231	0,662
Hansen-J: p-val	1,000	1,000

Notes: \*\*\*, \*\*, \* denote significant at significant at 1%, 5%, and 10% of t-statistics

Sources: Data Proceed (2020).

## CONCLUSION

Referring to the results of the hypothesis verification data and considering empirical facts in the period of observation, the authors concluded that this research was also intended to test the phenomenon of capping policy as a micro-prudential implementing authority. It aimed at maintaining the stability of the banking sector, reducing competition for funds rates, lowering costs, insolvency, and encouraging banking credit growth. Therefore, capping should not overlap with monetary policy, but precisely to make the transmission run more effectively through the mix between the two policies (mix policy). The results of this study proved that both monetary, interest rate capping policy and the mix between the two have been able to maintain stability and encourage credit growth.

The implementation of such policy through the application of BI Rate does not consistently and effectively reach the transmission target as expected. Also, market participants do not always refer to signals given by the monetary authority to lead to the targets to be achieved, such as funds or credit interest rates, growth targets, and the money supply. Therefore, the micro-macro policy mix has been reflected in the implementation of the current capping policy, which does not leave BI dignity as the reference rate. Since it was first introduced in October 2014, capping has been determined regarding certain amounts above the BI Rate. Hence, it always moves in the direction of the BI rate. The specified amount (bps) is determined by referring to the performance of each individual or group of banks which is estimated to predominantly influence monetary policy (in this case, banks BUKU 3 and BUKU 4). Through this mixed policy, BI and FSA can work together to achieve the 'right' target, in order to guide macroeconomic targets to lead to desired parameters, including money supply, inflation rates, credit growth, exchange rate stability, and economic growth.

The findings in this research confirm the hypothesis and previous research that the direct interaction and policy mix between macroprudential regulation and micro-prudential policy has a role in reducing the occurrence of credit shocks. The ability of micro-prudential authorities to enforce financial services institutions to follow the benchmark interest rate can encourage the transmission of monetary policy to be more effective in achieving the desired targets, i.e., fund interest rates and credit growth. Therefore, to be effective, intensive communication between the monetary (BI) and the Financial Services Sector Supervisory Authority (FSA) needs to be carried out in setting the BI Rate target. Also, the coordination mechanism and protocol for determining the amount of benchmark interest rate need to be regulated in a 'rigid' manner to create harmony between the monetary and macroeconomic targets that are conducive for the

financial services sector to support, grow, and perform well. In addition, without the stability of the financial services sector, especially banks, the effectiveness of the monetary policy will only become a utopia.

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