The Credit Market Management Through The Macroprudential Policy and Other Selected Macroeconomic Variables in Indonesia

Iqbal Fahmi[a], Norasibah Abdul Jalil[b1*], Norimah Rambeli@Ramli[c]

[a]*Universiti Pendidikan Sultan Idris, iqbalf11@gmail.com*
[b]*Universiti Pendidikan Sultan Idris, norasibah@fpe.upsi.edu.my*
[c]*Universiti Pendidikan Sultan Idris, norimah@fpe.upsi.edu.my*

Published: 11 June 2023

To cite this article: Fahmi, I, Abdul Jalil, N., & Rambeli@Ramli, N. (2023). The Credit Market Management Through The Macroprudential Policy and Other Selected Macroeconomic Variables in Indonesia, Management Research Journal, 12(1), 64–75. https://doi.org/10.37134/mrj.vol12.1.6.2023

To link to this article: https://doi.org/10.37134/mrj.vol12.1.6.2023

Abstract

Management is the process of dealing with or controlling things, system or people. Many use this term in business and organizational perspectives. However, management is also applicable in economic perspective. In the existing study, the focused issue relates the managemnet of an economic tool in influencing the other economic variable. In particular, the study is about managing the credit market through the macroprudential policy and other selected macroeconomic variables namely GDP, interest rates, and property prices. The study focuses on the Indonesian credit market. To achieve the general objective, the following specific objectives are set in the following order; to detect the existence of the cointegration relationship between the variables, and to examine the dynamic interaction between the focused variables both in long run and short run. This study used quarterly data from Q1 2011 to Q4 2019[2]. The data were analyzed by using Auto Regressive Distributed Lag (ARDL). The results of the ARDL's test give indication, in the long run the credit market is significantly and negatively affected by changes in Macroprudential policies and Property Price, and significant and positive association with GDP and interest rates. The results obtained from the Error Correction Model; which captures the short-term interactions between the focused variables had detected significant results in all factors except for property price factor. The overall findings lead us to conclude; the implementation of Macroprudential policy significantly affect the Indonesian credit market. As the implication, Indonesian government may consider Macroprudential policy as an economic tool in achieving a stable credit market in the future.

Keywords: *Macroprudential, macroeconomics, credit, property price, interest rate*

INTRODUCTION

Financial stability is about the absence of system-wide episodes in which the financial system fails to function and opens the door to crisis. It is also about the resilience of financial systems to shocks. A well-managed financial system that ensures stability is capable of efficiently allocating resources, assessing and managing financial risks, maintaining employment levels close to the economy's natural rate, and eliminating relative price movements of real or financial assets that will affect monetary stability or employment levels.

[1] *Corresponding Author: norasibah@fpe.upsi.edu.my*
[2] The Credit Market Management Through The Macroprudential Policy and Other Selected Macroeconomic Variables in Indonesia.

To reach financial stability, an economy needs to be managed by an economic mechanism that works properly and contribute to efficient market operations; both in the real and the financial markets. In the financial market, having financial stability creates the potential in controlling the financial risks such as: credit, liquidity, market, etc (Schinasi, 2004).

The event of maintaining financial stability is very fundamental to all economies in order to avoid economic problems such as financial fluctuations and the worst, financial crisis. The event of financial crisis is considered as a problem as it has the possibility to mess in the financial market, which then will affect the real and labor market, and finally has the potential to paralyze the economy.

Many studies had provide evidences on this subject matter and among the few are Barell et al (2006), Hong et al. (2022), and Batuo et al. (2018). Barrell et al. (2006) figured that the cost incurred due to financial instability primarily concentrates on the fiscal expenditures and reductions in the overall Gross Domestic Product (GDP) experienced in the aftermath of banking crises. Hong et al. (2022) who research on the influence of financial stress on the volatility of crude oil come to a conclusion that, the dynamic impact of financial stress on crude oil displays an asymmetric characteristics. Batuo et al. (2018) focuses on the linkages between financial development, financial instability, financial liberalisation and economic growth in Africa. The findings suggest that both financial development and financial liberalization have a positive impact on financial instability.

In economic perspectives there are many policies implemented by the government to manage and treat the financial instability problem and one of them is through Macroprudential Policies. Macroprudential policy is a financial policy which aimed to ensure the stability of the financial system as a whole to prevent substantial disruptions in credit and other vital financial services necessary for stable economic growth. Historically, this policy was first implemented during the financial crisis which occurred at the United States in 2007 to 2008. The crisis provides a very meaningful lesson to the rest of the world on the importance of financial system stability in the provision of credit. According to Borio (2010) the main purpose of Macroprudential policy is to minimize the financial risks resulting from financial shocks or to avoid systemic risk. Until now, the Macroprudential policy remains relevant and is continuously adopted in many countries in reducing threats to the financial system. A study by Cerutti et al. (2015) concluded, the effectiveness of the Macroprudential policy in protecting and treating the economies from financial instability makes it a popular policy and is adopted in many countries.

In Indonesia the incidence of financial crisis was first triggered in 1996 and had continuously caused financial instability ever since. Learning from the US's success story on the effective implementation of the Macroprudential policy to combat financial instability problem, Indonesia had decided to follow the US's footsteps and the first step was taken in 2011. Until the time this paper is written, Indonesia had been engaged with Macroprudential policy implementation for more than five years. Throughout the years of this policy implementation, several questions related to the performance or the extent this policy succeeded in solving the problems arose. People, policy makers and researchers are getting curious and wonder how effective this policy is in solving the financial instability problems. Based on the questions raised up, it clearly shows a study need to be conducted to investigate the issue further and to provide empirical evidence on the findings.

With that regard, the current study is conducted with the aim to achieve the following general and specific objectives. The general objective of this study is to investigate the impact of Macroprudential policy and the selected macroeconomic variables on Indonesia's credit market. The specific objectives are; to identify the existence of a Cointegration relationship between the variables, to detect the existence of a Long Run relationship between the variables, and finally to determine the existence of a short-run relationship between the variables. The research questions this study is focusing on are; whether there is a cointegration relationship between the variables, whether o the variables have a long-run relationship, and whether the variables have a short-run relationship. In conducting the study the following hypotheses are established; No cointegration relationship for Objective 1, No long-run relationship for Objective 2, and finally No Short-run relationship for Objective 3.

LITERATURE REVIEW

The topic of financial stability is an important macroeconomic issue. Any economy, apart from targeting economic development and growth, they cannot escape by linking these two goals with financial stability of the economy. Under normal conditions, many studies prove that the main contributing factor for economic growth is the country's financial stability. Several studies suggest that a stable financial sector affects economic development and growth positively. This is because a healthy financial system creates a medium that helped to channel household savings into value-creating investments, monitors borrowers to increase efficiency, helps agents pool, share and diversify risk, and facilitates trade. Studies by Levine (2005), Levine (1997), Beck (2012) and Demirgüç-Kunt and Levine (2008) have provided literature on financial stability and economic growth nexus. Other than that, Ahulu et al. (2021) in their study support the previous studies and claimed, a stable financial sector reflects a high capital adequacy ratio, an improved liquidity, a reduced risk associated with investments and increase capital accumulation. Financial stability will contribute significantly to economic growth.

Apart from financial stability, the issue of financial instability is no less important and often receives attention from researchers. Among them are studies by Barrell et al. (2006), Hong et al. (2022) and Batuo et al. (2018). Barrell et al. (2006) in their study assess the repercussions of both banking and currency crises on consumption patterns within 19 member countries of the Organisation for Economic Co-operation and Development (OECD). They figured that the cost incurred due to financial instability primarily concentrates on the fiscal expenditures and reductions in the overall Gross Domestic Product (GDP) experienced in the aftermath of banking crises. This finding demonstrates that consumption plays a pivotal role in the adjustment process following a crisis, and these effects cannot be solely attributed to the impact of crises on conventional determinants of consumption, namely income and wealth. Additional factors, including fluctuations in confidence levels, heightened uncertainty, and limitations on credit access, contribute to the overall impact. Furthermore, these effects are exacerbated by elevated and increasing leverage, despite the relaxation of liquidity constraints resulting from financial liberalization. The presence of high leverage suggests that contemporary banking crises may have a more widespread impact than those experienced in the past.

Hong et al. (2022) in their study examine the influence of financial pressure on the volatility of crude oil by utilizing a model known as the time-varying transition probabilities Markov regime-switching GARCH model (TVTP-MS-GARCH). In specific the primary objective is to investigate the potential nonlinearity and shifts in regimes between crude oil volatility and financial stress. The results strongly corroborate the existence of potential shifts in regimes between these two financial factors. When compared to the symmetric TVTP-MS-GARCH model, the standard model which is based on an asymmetric framework demonstrates superior predictive performance in out-of-sample assessments. This suggests that the dynamic impact of financial stress on crude oil displays an asymmetric characteristic.

Batuo et al. (2018) in their study investigate the interconnections among financial instability, financial liberalization, financial development, and economic growth within a dataset encompassing 41 African countries spanning from 1985 to 2010. The findings suggest, both financial development and financial liberalization have a positive impact on financial instability. Additionally, the results indicate that economic growth has a mitigating effect on financial instability, with a more pronounced reduction observed in the period before compared to the period of after financial liberalization.

When there is financial instability, the government will work hard to prevent the contagion effect of this economic problem and putting the country's economy in a worse state. Many recent studies have focused on Macroprudential policy to mitigate financial crisis, especially the one caused by the credit system. Research conducted by Akinci (2017) who focused on the implementation of Macroprudential policy in 57 developed and developing countries found five important facts to conclude.

i. The implementation of Macroprudential policy has been widely applied by developed and developing countries after the global financial crisis in 2008.
ii. The main target of this policy is housing/property sector, especially in developed countries.
iii. Macroprudential policy is usually simultaneously-determined by the bank reserve requirements, capital flow restrictions, and monetary policy.
iv. Macroprudential tightening can give an impact on housing price, housing loan, and bank credit growth.
v. The target of this policy can be used to limit house price appreciation.

The results of the study in financial crises prove that there is a needed for Macroprudential policy. Viewed from two different perspectives namely researchers (Andries et al., 2018; Cerutti et al., 2015) and practitioners (Aikman et al., 2019; BIS, 2019; BCBS, 2011) provide similar suggestion of approving the adoption of the Macroprudential policy in dealing with credit market instability. Rubio and Carrasco-Gallego (2017) conducted a study by looking at the impact of the loosening in credit system in Europe on increased demand for housing, which resulted increasing in house prices and credit in Spain. The results obtained explain that Macroprudential policies through LTV (Loan-to-Value) instruments can significantly affect housing prices in Spain and can also reduce the credit boom in Spain.

Leduc et al. (2015) in their study made an assertion on the role of monetary and Macroprudential policies. They claimed that Macroprudential policies are more dominant towards credit growth, while monetary policy focused on price stability as a response to financial shocks and productivity. Based on these findings, it can be concluded that Macroprudential and Monetary policies can be implemented together. Furthermore, strong Macroprudential policies may bring monetary policy more loosely, and vice versa.

Gozgor (2014) conducted a study by looking at the relationship between GDP and domestic credit levels in 58 developing and developed countries using Hatemi-J asymmetric causality test. The results of this study indicate that economic growth can affect domestic credit levels in only seven countries (Austria, Japan, Spain, UK, Finland, New Zealand, and Netherland tea). The results of a similar study were also found in Adeleye et al. (2018) who analyzed the relationship between GDP and credit in Nigeria. The results of Mohanty et al. (2016), who put focus on the same theme showed that GDP and credit have a unidirectional relationship, where India's economic growth has a positive effect on credit.

METHODOLOGY

This section provide a detailed explanation on model specification development and analyses conducted. This general objective of this study is to analyze the relationship between Macroprudential policy and selected macroeconomic variables on credit market. The model is adopted from Cerutti at al. (2015) with some modification (by adding interest rate and property price index as independent variables). The linear function for the estimation model is as follow;

$$CRED_t = f(MPI_t, GDP_t, INRATE_t, PROPERTY_t) \quad (1)$$

The reduce form for equation (1) is as follows;

$$CRED_t = \beta_0 + \beta_1 MPI_t + \beta_2 GDP_t + \beta_3 INRATE_t + \beta_4 PROPERTY_t + \varepsilon_t \quad (2)$$

By considering the logarithm (log) denoted by ln, the equation (2) is transformed into linear logarithm model as in the following equation;

The general model specification is specified as follows;

$$\text{In } CRED_t = \beta_0 + \beta_1 \text{In } MPI_t + \beta_2 \text{In } GDP_t + \beta_3 \text{In } INRATE_t + \beta_4 \text{In } PROPERTY_t + \varepsilon_t \quad (3)$$

According to equation (3), CREDt is level of credit at time t, MPIt is the Macroprudential index at time t, LnGDPt is ln GDP at time t, INRATEt is the level of interest rate at time t, and finally PROPERTYt is property price at time t. β0 is the intercept of the model, and β1, β2, β3, and β4 are the slope parameters of the model, and finally εt is the is a stochastic error term.

Before data analyses is conducted, each data underwent the unit-root test to confirm each stationarity status. Data achieving stationary status either at level or at first difference are considered in this study, and no I(2) data is included in order to avoid model mis- specification problem. In the existing study all data had fulfilled these criteria, and the data analysis is extended to the following tests; optimum lag length determination, the integration or the F-bound Test and finally the short run test or the Error Correction Modelling.

In order to achieve the objective already set, data analysis adopts Autoregressive distributed lag (ARDL) model proposed by Pesaran *et al*. (2001). The ARDL model testing procedure consists of three main stages namely; the ARDL bound cointegration test, the ARDL Long- run estimation and the ARDL short Run- estimation;

ARDL bound cointegration model

$$\Delta In\ CRED_t = \propto_0 + \propto_1 \text{In } CRED_{t-1} + \propto_2 \text{In } MPI_{t-1} + \propto_3 \text{In } INRATE_{t-1} + \propto_4 \text{In } PROPERTY_{t-1} + \sum_{i=1}^{p} \beta_1 \text{In } CRED_{t-1} + \sum_{j=0}^{q} \beta_2 \text{In } MPI_{t-j} + \sum_{m=0}^{s} \beta_3 \text{In } INRATE_{t-m} + \sum_{z=0}^{k} \beta_4 \text{In } PROPERTY_{t-z} + \vartheta_t \quad (4)$$

Based on above function, α_0 is constant; while α_1, α_2, α_3 and α_4 are slope coefficients for the model. In addition, ϑ_t is error term for the model. The long-run coefficients denote by. Moreover, the short-run coefficients denote by β_1, β_2, β_3, and β_4. In this study the Wald-test was employed in order to perform the joint test hypothesis as follows;

Wald-test for ARDL Bound Co-integration Test

H_0: $\beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = \beta_6 = \beta_7 = 0$
H_1: $\beta_1 \neq \beta_2 \neq \beta_3 \neq \beta_4 \neq \beta_5 \neq \beta_6 \neq \beta_7 \neq 0$

Under the Wald-test testing procedure, the F-statistic value produced by the estimation model was compared with the critical F-statistical value produced by Narayan (2005). This test may lead to three conclusions. Firstly, the null hypothesis can be rejected if the F-statistic value obtained from the estimation model is larger than the upper bound critical F-statistic table, which thus confirmed the co-integration between the variables. Secondly, if the F-statistic value obtained from the estimation model is less than the lower bound critical F-statistic table, the hypothesis cannot thus be rejected. Finally, the analysis is not conclusive if the F-statistic values are within the upper and lower critical values. After the variables co-integration was obtained, the next stage is the development of the long-term estimation model as follows;

ARDL Long-run estimation

$$In\ CRED_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \text{ In } CRED_t + \sum_{j=0}^{q} \beta_2 \text{ In } MPI_{t-j} + \sum_{m=0}^{s} \beta_3 \text{ In } INRATE_{t-m} + \sum_{z=0}^{k} \beta_4 \text{In } PROPERTY_{t-z} + \vartheta_t \quad (5)$$

Next the short run model is calculated by examining the error correction (ECM) model as follows;

ARDL short Run- estimation

$$\Delta In\ CRED_t = \beta_0 + \omega ECT_t \sum_{i=1}^{p} \beta_1 \text{ In } CRED_{t-I} + \sum_{j=0}^{q} \beta_2 \text{ In } MPI_{t-j} + \sum_{m=0}^{s} \beta_3 \text{ In } INRATE_{t-m} + \sum_{z=0}^{k} \beta_4 \text{In } PROPERTY_{t-z} + \vartheta_t \quad (6)$$

Referring to equation (6), the notation of ω denote as the error correction terms magnitude value for CRED model. This magnitude measures the speed of adjustment of CRED system equation from short run disequilibrium to the long-term equilibrium. As stated by Rambeli et al (2021), the value of speed adjustment usually less than zero and with negative sign.

FINDINGS OF THE STUDY

The determination of the lag length in this study uses the Akaike Information Criteria (AIC), as has been commonly used. Determination of the length of this lag aims to specify the amount of information lost when determining the model specification. In the current study, the optimum lag length is identified at 4, 3, 4, 2, and 4. The dependent variable is CRED (natural logarithm for Credit), while the independent variables are MPI (Macroprudential Policy Index), LGDP (natural logarithm for GDP), INTRATE (interest rate), and PP (property price index).

After getting the optimal lag length model, the next step is conducting the Bound Test. The Bound test is carried out to conclude whether the model has cointegration relationship in the long run by comparing F-statistic with the lower bound and upper bound values. The result summary for this test is displayed in Table 1.

Table 1 The F-Bound Test

Model		F-Statistics
CRED = f (MPI, GDP, IR, PP)		17.01707
Actual Sample Size (n) = 36	Lower Bound [I(0)]	Upper Bound [I(1)]
1%	4.4	5.72
5%	3.47	4.57
10%	3.03	4.06

The results in Table 1 provide indication on the existence of long run cointegration relationship between the variables. The F-statistic value is above the upper and lower bound values at 5 % which implies a significant result. Therefore, we may conclude, cointegration relationship exists between the variables. Theoretically, when the cointegration is confirmed, then it is now possible to estimate the long run model and the restricted error correction model (ECM). With regards to this, the next step focuses on measuring the equilibrium relationship in the long run and short run.

The following test measures the Long Run relationship and the overall results are displayed in Table 2. Based on the results obtained, each variable is detected to have a significant effect on credit. GDP and interest rate are positive and statistically significant at 1 % level, while Property and MPI are negatively and significantly related at 10 % level. Here we may imply, the Credit response to changes in each explanatory variable varies. Specifically, the response of GDP to credit is bigger than other variables.

This means; GDP has an important role in influencing changes in credit compared to other variables tested in this study. It is also observed; property factor when compared with other variables, appear to be less responsive to credit factor.

Table 2 Long Run ARDL Model Estimation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MPI	-0.012387 ***	0.006191	-2.000.827	0.0804
LGDP	11.15033 *	1.184538	9.413232	0.0000
INRATE	0.011265 *	0.002115	5.326746	0.0007
PROPERTY	-0.005028 ***	0.002670	-1.883529	0.0964

EC = LCREDIT - (- 0.0124 * MPI + 11.1503 * LGDP + 0.0113* INRATE - 0.0050 * PROPERTY

*; **; *** Significant at the 1%; 5%; 10%

Based on the results in Table 2 also, MPI is observed to have a significant negative association with Credit. This means when MPI increases by 1 %, credit will reduce at the rate of -1.2 %. Focusing on GDP, this variable is detected to have a positive and significant relationship. This means, in the long run, if other variables are constant credit will increase by the amount of 11.1 %. These findings lead us to conclude, in the long run Indonesia will experience economic deepening; in which, interest rate is positively and significantly related to credit, with coefficient to interest rate equals to 0.011. It means, when interest rate increase by 1 percent, it will affect credit to increase by 0.011 percent. For Property price, the coefficient value is negative and significantly related with changes in credit. Here we may conclude, if property price increases by 1 %, credit will decrease by 0.5 % in the long run.

Compares to previous literatures, the findings of this study appear to be different with Ayyagari et al. (2017) who detected no long run relationship between credit and Macroprudential policy. However, the findings of the current study is in line with the study by Fendoglu (2016) who provides suggestion that the tightening of Macroprudential policy can significantly affect credit and GDP growth in the long term. Next is a study by Sakti et al. (2018) who made an assertion, in the long run credit growth can be influenced by Macroprudential policy, GDP, and interest rates. Here we may conclude, both GDP and Macroprudential have a positive relationship with credit, while interest rates have a negative relationship.

The next analysis is the ECM short run test and results are displayed in Table 4. The main focus is of the ECM test is observe the ECT coefficient (or term) value. The ECT coefficient (shown as CointEq) implies the speed of adjustment of the variable and also provide information of convergence activity of the variables to equilibrium in the long run.

Based on the results obtained, the ECT term is negative, which implies convergence to equilibrium in the long run, value more than 1 and significant. These results provide indication on the existence of a long run relationship between the dependent and independent variables. The ECT coefficient describes the speed of data that return to long run equilibrium after a shock in short run occurs. The result for the current study shows that, the coefficient of CointEq is negative and is significant at 1 %, which indicates that it corrects 1.2 % back to long run equilibrium level within one period. The ECT term which values more than 1, as occurred in the existing study may trigger a call for model revision. According to Narayan and Smyth (2006), the range of error correction coefficient is from 0 to less than 2 (with negative sign and significant). If the value is less than 1 it means equilibrium will be adjust monotonically and if value is greater than 1 and less than 2 (with negative sign and significant) it shows equilibrium will be adjustED in a dampening manner (the error correction process fluctuates around the long-run value).

Table 3 ECM (Unrestricted Constant and Trend)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.11562	0.010153	-11.38827	0.0000
@TREND	-0.000778	0.000093	-8.334854	0.0000
D(LCREDIT(-1)	0.037358	0.097468	0.383281	0.7115
D(LCREDIT(-2)	-0.096717	0.097042	-0.996645	0.3481
D(LCREDIT(-3) *	-0.488628	0.072579	-6.732411	0.0001
D(MPI) ***	0.004714	0.002458	1.917307	0.0915
D(MPI(-1) *	0.022729	0.002805	8.101938	0.0000
D(MPI(-2) **	0.005295	0.001856	2.853177	0.0214
D(LGDP) *	2.731948	0.509439	5.362664	0.0007
D(LGDP(-1) *	-7.210005	0.950486	-7.585597	0.0001
D(LGDP(-2) *	-4.017671	0.726872	-5.527342	0.0006
D(LGDP(-3)	-0.588522	0.531132	-1.108052	0.3000
D(INRATE) **	0.005588	0.001709	3.269400	0.0114
D(INRATE(-1) *	-0.007624	0.001980	-3.849539	0.0049
D(PROPERTY)	-0.000708	0.000591	-1.197830	0.2653
D(PROPERTY(-1) *	0.006091	0.000698	8.720898	0.0000
D(PROPERTY(-2) *	0.005224	0.000840	6.216348	0.0003
D(PROPERTY(-3) *	0.004402	0.000742	5.934394	0.0003
CointEq(-1)*	-1.201662	0.106368	-11.297260	0.0000

*; **; *** Significant at the 1%; 5%; 10% and (no) Not Significant

To determine parameter stability, CUSUM (Cumulative of Sum) and CUSUMQ(Cumulative of Square) tests are adopted. The results of these tests are displayed in Figure 1 and Figure 2.

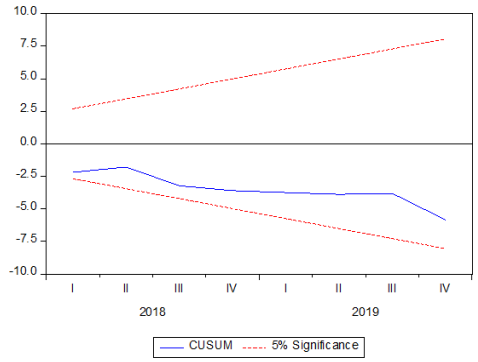

Figure 1 CUSUM

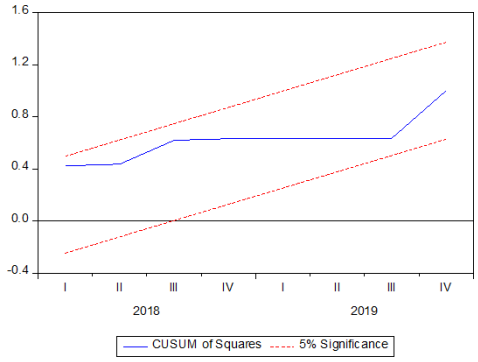

Figure 2 CUSUM SQR.

Both tests documented significant results at 5% level of significance. The CUSUM and CUSUM SQR lines appear do not cross the upper and the lower limits. This indicates if the model parameter is stable.

CONCLUSION AND DISCUSSION

The findings of this study show that Macroprudential policy and property price have a negative and significant effect on the credit market, while GDP and interest rates have a positive and significant effect. This means, the implementation of the Macroprudential policy in the long run has the ability to reduce credit growth. In the short run, all variables in the study documented significant relationship

with credit market, except for property price. The results of the ECM test also show, the value of the ect coefficient (which measures the speed of adjustment) is negative and significant. Here we may conclude, the shocks that occur in the short run will converge (to equilibrium) in the long run. The overall findings provide indication that Macroprudential policy plays significant impact on the credit market. The findings provide affirmation that Macroprudential policy is considered as an appropriate policy implementation in controlling credit growth in Indonesia. Based on the results of the research, it is shown that GDP, interest rate, and property price index also significantly affect credit growth.

Based on the findings of this study we may infer that, Macroeconomic policy is a suitable policy for implementation in maintaining the rate of credit growth, particularly in Indonesia. The findings of this study appear to be consistent with the study conducted by Budnik (2020) who focused on 28 European Union countries using panel data. Budnik (2020) made an assertion that Macroprudential policy have a significant impact in dealing with credit, which also minimizes systemic risk in the financial sector. The findings of the existing study also appear to be consistent with the study conducted by Araujo et al. (2020) who conclude that Macroprudential policy statistically significant on credit. This conclusion is drawn from the results of 58 empirical studies. Therefore, policy makers in Indonesia (Bank Indonesia) are expected to manage the economy efficiently thru Macroprudential policy implementatiion in dealing with the changes in the credit market. This is due to the fact that, if the policy is loosely managed, which the rate of credit growth is not controlled, it has the potential to expose a negative impact to financial stability, and if managed tightly (Macroprudential) policy on credit, it poses the risk of spilling over the negative effect on economic growth.

REFERENCES

Adeleye, N., Osabuohien, E., Bowale, E., Matthew, O., & Oduntan, E. (2018). Financial reforms and credit growth in Nigeria: empirical insights from ARDL and ECM techniques. *International Review of Applied Economics, 32*(6), 807-820.

Aikman, D., J. Bridges, A. Kashyap, and C. Siegert (2019). Would Macroprudential Regulation Have Prevented the Last Crisis?. *Journal of Economic Perspectives, 33*(1), 107– 130.

Akinci, O., & Olmstead-Rumsey, J. (2017). How effective are Macroprudential policies? An empirical investigation. *Journal of Financial Intermediation 33*, 33-57.

Andries, Melnic. F, and Mutu. S., N. (2018). Effects of Macroprudential policy on systemic risk and bank risk taking. *Czech Journal of Economics and Finance 68*(3), 202–244.

Araujo, J. D., Patnam, M., Popescu, M. A., Valencia, M. F., & Yao, W. (2020). Effects of macroprudential policy: Evidence from over 6,000 estimates. *IMF Working Paper*. WP/20/67.

Ayyagari, M., Beck, T., & Martinez Peria, M. S. (2017). Credit growth and Macroprudential policies: Preliminary evidence on the firm level. BIS Paper, (91a).

Bank for International Settlements (BIS). 2018. "Moving Forward with Macroprudential Frameworks." In Annual Economic Report. Basel, 63–90.Barrell, R., Davis, E.P., Pomerantz, O.(2006).Costs of financial instability, household-sector balance sheets and consumption, Journal of Financial Stability, 2(2), 194-216. ISSN 1572-3089. https://doi.org/10.1016/j.jfs.2006.05.001.

Batuo, M., Mlambo, K., & Asongu, S. (2018). Linkages between financial development, financial instability, financial liberalisation and economic growth in Africa. *Research in International Business and Finance*, *45*, 168-179. https://doi.org/10.1016/j.ribaf.2017.07.148

BCBS (Basel Committee on Banking Supervision) (2011). Basel III: A global regulatory framework for more resilient banks and banking systems. Retrieved from https://www.bis.org/publ/bcbs189.htm

Beck, T. (2012), The Role of Finance in Economic Development-Benefits, Risks, and Politics. Oxford Handbook of Capitalism. Oxford, England: Oxford Ubiversity Press

BIS (Bank of International Settlement, 2019). Annual Economic Report. Retrieved from https://www.bis.org/publ/arpdf/ar2019e.pdf

Borio, C. (2010). Implementing a Macroprudential Framework: Blending Boldness and Realism, keynote speech at the HKIMR-BIS Conference of Financial Stability: Towards a Macroprudential Approach, Hongkong SAR, 5-6 July, 2010.

Budnik, K. B. (2020). The effect of macroprudential policies on credit developments in Europe 1995-2017. *ECB Working Paper Series.* No. 2462 / August 2020.

Cerutti, E., Claessens, S., & Laeven, M. L. (2015). The use and effectiveness of Macroprudential policies: new evidence. IMF WorkingPaper, No. 15/61. Retrieved from https://www.imf.org/~/media/Websites/IMF/imported-full-text-pdf/external/pubs/ft/wp/2015/_wp1561.ashx

Demirgüç-Kunt, A., Levine, R. (2008), Finance, financial sector policies, and long-run growth. In: World Bank Policy Research Working Paper Series. Washington DC: World Bank

Fendoglu, S. (2016). Credit cycles and Macroprudential policy framework in emerging countries. BIS Paper, (86d).

Gozgor, G. (2014). Determinants of domestic credit levels in emerging markets: The role of external factors. *Emerging Markets Review*, 18, 1-18.

Hong, Y., Wang, L., Liang, C., & Umar, M. (2022). Impact of financial instability on international crude oil volatility: New sight from a regime-switching framework. *Resources Policy*, *77*, 102667. https://doi.org/10.1016/j.resourpol.2022.102667

Mohanty, A. R., and Mishra, B. R. (2016). Impact of public debt on economic growth: Evidence from Indian states. Vilakshan, *XIMB Journal of Management, 13*(6), 1–21.

Lang, J. H., and P. Welz. 2017. "Measuring Credit Gaps for Macroprudential Policy." Financial Stability Review, European Central Bank (May) 144–157.

Leduc, S. and Natal, J.M. (2015). Monetary and Macroprudential Policy in a Leveraged Economy. Federal Reserve Bank of San Francisco working paper 2015-11. Retrieved from https://www.frbsf.org/economic-research/files/wp11-15bk.pdf

Levine, R. (1997), Financial development and economic growth: Views and agenda. *Journal of Economic Literature, 35*(2), 688-726.

Levine, R. (2005), Finance and growth: Theory and evidence. In: Aghion, P., Durlauf, S., editors. Handbook of Economic Growth. Ch. 12. Netherlands: Elsevier. 865-934.

Narayan, P. K. (2005). The saving and investment nexus for China: evidence from cointegration tests. *Applied economics*, *37*(17), 1979-1990

Narayan, P. K., and Smyth, R. (2006). What determines migration flows from low-income to high-income countries? An empirical investigation of Fiji–Us migration 1972– 2001. *Contemporary Economic Policy, 24*(2), 332-342.

Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). Bounds testing approaches to the analysis of level relationships. *Journal of applied econometrics*, *16*(3), 289-326.

Rambeli, N., Marikan, D.A., Hashim, E., Ariffin, S. Z. M., Hashim, A., & Podivinsky, J. M. (2021). The Determinants of Carbon Dioxide Emissions in Malaysia and Singapore. *Jurnal Ekonomi Malaysia, 55*(2), 107-119.

Rossini, R., and Z. Quispe. 2017. "Implementation of Macroprudential Policy in Peru." BIS Papers no. 94, 257.Rubio, M., and Carrasco-Gallego, J.A. (2017). Spain and the crisis: Housing prices, credit and macropru-dential policies. *Singapore Economic Review, 62*(1), 109–133.

Sakti, M. R. P., Thaker, H. B. M. T., Qoyum, A., & Qizam, I. (2018). the concept and practice of Macroprudential policy in Indonesia: Islamic and conventional. *Al-Iqtishad Journal of Islamic Economics, 10*(1), 75-96.

Schinasi, M. G. J. (2004). Defining financial stability. IMF Working Paper, No. 4-187.