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CONFERENCE PROCEEDING
11th International Conference & Call for Paper
Bulletin of Monetary Economics and Banking (BMEB)

August 24th, 2017
Jakarta, Indonesia

**SYNERGY ON THE VUCA WORLD:
MAINTAINING THE RESILIENCE AND
THE MOMENTUM OF ECONOMIC GROWTH**

Edited by:
Solikin M. Juhro
Ferry Syarifuddin

JAKARTA
2018



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A large, semi-transparent watermark of the University of Jember logo is centered on the page. The logo is a yellow shield with a red and green floral emblem in the center. The word 'UNIVERSITAS' is written in a semi-circle at the top, and 'JEMBER' is written in a semi-circle at the bottom.

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Bank Indonesia Institute (BINS)

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2018

Solikin M. Juhro

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FOREWORD FROM THE DEPUTY GOVERNOR

The challenges facing the global economy in the future will be felt even more severe amid the dynamic global economic development. Adaptation is needed because of the still strong global volatility, uncertainty, complexity, and ambiguity (VUCA). The recent crisis had deeper and shorter impact, yet a prolonged recovery compared to crisis in the 1950's, 1960's, and 1980's, as shown by recent IMF studies. The guiding principle of the policy on the strength of sustainable macroeconomic structural reforms, strengthening institutions, as well as the first account system policy framework is needed. Nevertheless, we have to be mindful this policy may not be going in the consistent way. Some of the policies can strengthen growth but the others are more fragile. For example, financial market deepening can support economic growth but at the same time may also increase vulnerability. Therefore other important policies such as structural reforms on the institutions, labour and so on may, at the same time are needed to be implemented to which may also impact on economic resilience.

In ASEAN, to support sustainable economic growth and maintain its resilience, we need to build several layers, or multiple layers of safety nets at the national as well as regional and global levels. The first layer has function as to make sound economic fundamentals, by implementing appropriate economic policy, financial structural reforms, adequate FX reserves as well as prudential management and strong institutional policy. The second layer as the of defence by enhancing mutual cooperation with other central banks, regionally, for example through the Chiang Mai Initiative (CMI), and even more through international economic cooperations among country. As a central bank, we need to implement and combine various relevant economic policies called, policy mix to support macroeconomic stability. We have to have a proper policy mix combining central bank monetary and macroprudential policy as well as fiscal policy and, at the same time, implement structural reforms to achieve national welfare.

The central bank policy mix supports monetary and financial stability through interest rate policy, exchange rate policy, macroprudential policy and other policies, fiscal policy and, at the same time, support macroeconomic stability as well as supporting structural reforms to increase productivity, reform investment, infrastructure and others. Policy mix is very important as every policy has their own objective. Thus, we need to have coherent synergy of the objectives and the right optimal policy instruments. As we understand, monetary policy as well as fiscal policy can stimulate economic growth in the short term through the demand side as well as policy on the financial sector. Meanwhile, to increase economic growth, we still need structural reforms. Thus, we are able to increase our economic growth but at the same time we can manage our demand through macroeconomic stabilization policy. This is the stability and growth nexus through monetary-fiscal policies, immediate and structural reforms. But in the VUCA world, this is not enough because globalisation is introducing more cycles - economic, financial, boom and bust. In the VUCA world, the line of thinking to make proper fiscal, monetary and structural reforms is not enough. We have to be able to manage the economic and financial cycles from financial development as well as from the capital flows. Studies have shown that many crises occur because of excessive external debt, excessive lending, excessive leverage and so on. In this sense, macroprudential policy and capital flow management are needed to managed the cycles of boom and bust. Beyond on that, appropriate macroeconomic policy should be based on research and proceeding reliable.

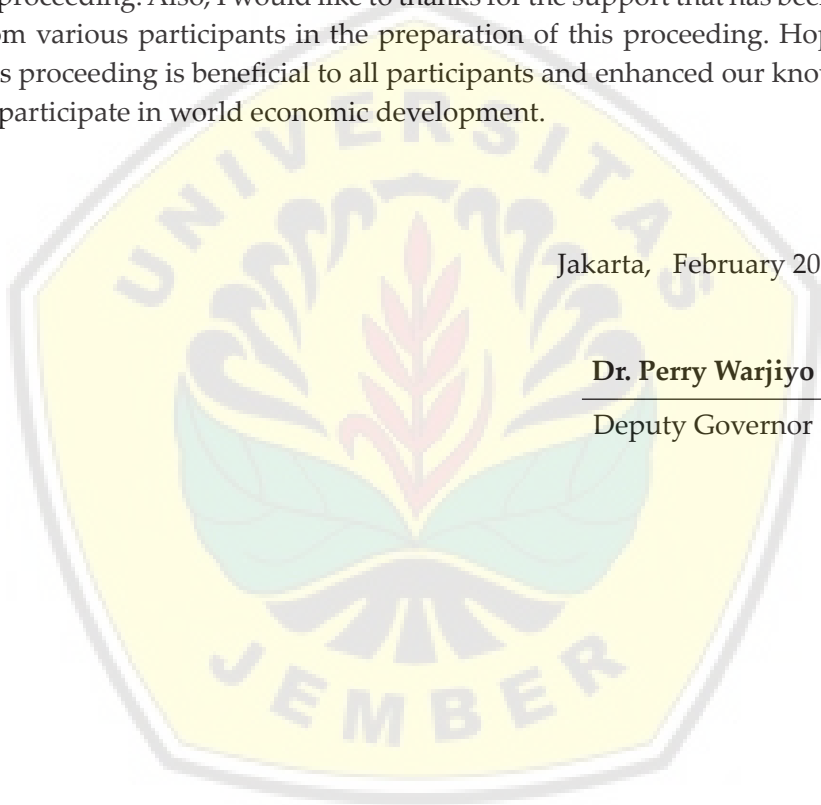
This proceeding is a summary of the 11th International Conference of Monetary Economics and Banking (BMEB) Synergy on the VUCA World: "Maintaining the Resilience and Momentum of the Economic Growth". The results of the seminar are expected to provide added value in the academic order, and for regulator to implement better strategies and policies when facing VUCA of the world economy.

Finally, I would like to express my appreciation to all the team of Bulletin of Monetary Economics and Banking (BMEB) - Bank Indonesia Institute which has coordinated all the process of seminar and arrangement of proceeding. Also, I would like to thanks for the support that has been given from various participants in the preparation of this proceeding. Hopefully, this proceeding is beneficial to all participants and enhanced our knowledge to participate in world economic development.

Jakarta, February 2018

Dr. Perry Warjiyo

Deputy Governor



REPORT FROM COMMITTEE

Honourable, Governor of Bank Indonesia, Members of Board of Governors of Bank Indonesia, Members of Honorary Board of the Bank Indonesia Institute, Distinguished Speakers and International Conference Participants, Valued Guests from related ministries and universities from all over the country, All committee members & parties with whom we have collaborated to hold this event, Ladies and Gentlemen.

Assalaamu'alaikum Wr. Wb.,

Peace be upon us,

A Very Good Morning and Welcome to Jakarta 'the capital city of the Republic of Indonesia'.

First of all, let us extend our praise to Allah, God Almighty, since only with His permission and blessings can we congregate here this morning to attend the 11th International Conference on "SYNERGY IN THE VUCA WORLD: MAINTAINING THE RESILIENCE AND MOMENTUM OF ECONOMIC GROWTH", Thursday 24th August 2017, hosted by the Bank Indonesia Institute.

It is an honour for me to welcome all of you to Bank Indonesia. On behalf of the organiser, the Bank Indonesia Institute, I would like to express my most sincere gratitude for your attendance at this Opening Ceremony as a gateway to our extensive economic discussions. I would also particularly like to extend a warm welcome to our distinguished guests from abroad.

On this special occasion, we are especially thankful to the Governor of Bank Indonesia and other members of Board of Governors, who, despite their heavy workloads, duties and responsibilities, have guided us with valuable thoughts to dignify our international conference here today. Many of the dignitaries sharing their time with us today have had to reshuffle previous commitments in their routine and professional duties to find time to support and appreciate the International Bulletin of Monetary Economics

and Banking (BMEB). Indeed, our dignitaries are represented by 24 selected participants from 110 applicants, the selection process of which consisted of choosing both the best five papers and the best five posters through tight criterias such as clarity, significance, relevance with the theme, theoretical background, relationship to literature, research design and data, analysis, and critical values. The applicants were selected from among 8 different countries including Spain, Italy, Turkey, United States, Kazakhstan, Kyrgyztan, United Kingdom and, of course, Indonesia.

Distinguished guests, fellow participants,

Before I touch upon the specific topics we will be discussing today, let me add a few remarks to this special international conference organised by the Bank Indonesia Institute. This 11th conference has been organised, not only to continue and consolidate the successes of previous conferences, but also to commemorate a decade of publication of our journal: the Bulletin of Monetary Economics and Banking.

In this regard, we also want to acknowledge the many parties who have collaborated in this endeavour to maintain or even improve the high standards of this Conference, as demonstrated over the years. It has been a very pleasant experience to work together with you, to make our idea a reality at this 11th Conference. To deliver productive discussions concerning VUCA (volatility, uncertainty, complexity, ambiguity) analysis, we would like to include the outstanding researchers, academicians, policymakers and practitioners from several countries in the monetary and macroeconomics fields, along with banking and finance, as well as international and development economics. Thank you so much for being here.

At this opportunity, I would like to recognise and thank our key speakers of the plenary session, which will be taking place right after the welcoming ceremony. During the session, we will be hearing from four prominent speakers, including Prof. Ari Kuncoro, Dean of the Faculty of Economics and Business, University of Indonesia; Dr. Perry Warjiyo as Deputy Governor of Bank Indonesia; Prof. Dr. Hal Hill, from the Australian National University; and Dr. Andrew Sheng, from distinguished Asia Global Institute, University of Hong Kong. This plenary session will be chaired by Dr. Toni Prasetyantono. Prof. Ari Kuncoro, Dean of the Faculty of Economics and Business, University of Indonesia; Dr. Perry Warjiyo as Deputy Governor of Bank Indonesia;

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Prof. Dr. Hal Hill, from the Australian National University; and Dr. Andrew Sheng, from distinguished Asia Global Institute, University of Hong Kong. This plenary session will be chaired by Dr. Toni Prasetyantono.

The great British statesman Winston Churchill (1874-1965) used to say: *"I am always ready to learn, although I do not always like being taught"*. I invite you to teach us what you know as the fruits of your research and the many hours spent toiling in your laboratories trying to elucidate the mysteries of the global economy and the causes of financial crisis. Let us bring back the old spirit of the economic Congresses, when a Congress was the confrontation of knowledge and the encounter of wisdom rather than a political meeting or a parallel funding strategy for managerial purposes.

After all, as the great American physician, Charles H. Mayo (1865-1939) said a long time ago, *"The safest thing for an economy is to be in the hands of a man engaged in teaching economics. In order to be a teacher of the economy, the economist must always be a student"*. This encapsulates the spirit of a good researcher: to be a permanent student of science; because in science the absolute truths of today are always relative truths of tomorrow.

Distinguished guests, fellow participants,

Given the current VUCA circumstances, increasingly complex economic challenges are becoming onerous issues of great import that require highly qualified human resources equipped with both mastery of economic substance and prime leadership skills to cope with the nascent economic challenges.

Indeed, the Bank Indonesia Institute was established to overcome such challenges by means of capacity enhancement programs in terms of learning and research. The Bank Indonesia Institute dispenses quality and inclusive learning programs to enhance expertise amongst Bank Indonesia's employees with regards to central banking, management and leadership skills.

In addition, several programs have been designed to allow external stakeholders to fuse with Bank Indonesia, leading to shared opportunities. These programs are often carried out in terms of international flagship programs, partnering with leading agencies and institutions, either by central banks, such the Bank of England's Centre for Central Banking Studies, the Bundesbank's Technical Central Bank Cooperation or the Banque de France's International Banking and Finance Institute, which are advanced in terms of

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research and training, or with human resources development institutions such as Toronto Centre (which is a global leadership training centre for financial supervision), the BIS' Financial Stability Institute and the IMF Institute (for Capacity Development).

Concerning the research, the Bank Indonesia Institute's agenda is to refine leading research, by directing frontier research, not only on macroeconomic and financial sector issues, but also international and development economics, including economic leadership. We also support capacity building programs by providing academic research based materials and to assist wider research communities in the country.

The research shall be conducted inclusively by experienced researchers and scholars, such as Bank Indonesia Institute's researchers, faculty members and honorary board members, prominent research scholars (fellowships and visits), research grant beneficiaries and Bank Indonesia's Ph.D. students.

It is also a pleasure from me to inform you that the Bank Indonesia Institute has been regularly managing a journal website, known as Journal Bank Indonesia (www.journalbankIndonesia.org). This journal website serves as a vehicle for Bank Indonesia's online journals, namely "Bulletin of Monetary Economics and Banking" (BMEB), and "Journal of Islamic Monetary Economics and Finance (JIMF)".

Distinguished guests, fellow participants,

Before I conclude my remarks, let me note that, given the current circumstances, and particularly with regard to the post global financial crisis challenges and VUCA environment, this conference is structured around a number of presentations (consisting of six parallel sessions), each of which deals with a number of issues from different perspectives. Allow me once again to emphasise that the key objective of this conference is to share and discuss some of the emerging issues of a VUCA environment, concerning the global economic developments, economic policy strategies and some related quantitative techniques that are applied when analysing VUCA elements. I sincerely hope this conference yields the best results for all of us.

On behalf of Bank Indonesia, (again) I would like to express my sincere thanks and appreciation to the distinguished speakers, all participants and

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my colleagues in the organising committee for their great efforts in delivering a successful event.

Finally, I would like to say: “Enjoy a fruitful conference and I expect an interesting and beneficial day. Have a pleasant stay in Jakarta!”

Without further ado, allow me to respectfully invite the Governor of Bank Indonesia to deliver a keynote speech and officially open this conference.

Thank you very much.

Jakarta, February 2018

Dr. Solikin M. Juhro

Head of Bank Indonesia Institute



PARALLEL SESSIONS

PARALLEL SESSIONS A

**Global Uncertainties, Capital Flow Dynamics,
and Central Bank Policy Mix**

TITLE :

Credit Cycle, Capital flow and Effectiveness of the Macroprudential Policy in Indonesia

Achmad Fawaid Hasan, Adhitya Wardhono, M. Abd. Nasir, Ciplis Gema Qori'ah - University of Jember

Understanding Capital Flight Causality: A Comparative Analysis between Turkey and Indonesia (1980-2016)

Asli Cansin Doker - Erzincan university

Volatility Transmission of Global Main Stock Return to Indonesia

Linda Karlina Sari, Noer Azam Achsani, Bagus Sartono - Bogor Agriculture University

A Dynamic Stochastic General Equilibrium (DSGE) Model to Assess the Impact of Structural Reforms on the Indonesian Economy

Sahminan, Ginanjar Utama, Robbi Nur Rakman, Idham - Bank Indonesia

CHAIRPERSON :

Akhis R. Hutabarat, Ph.D

Bank Indonesia

CREDIT CYCLE, CAPITAL FLOW AND EFFECTIVENESS OF THE MACROPRUDENTIAL POLICY IN INDONESIA

Achmad Fawaid Hasan, Adhitya Wardhono,
M. Abd. Nasir, Ciplis Gema Qori'ah

Faculty of Economics and Business, University of Jember

ABSTRAK

Macroprudential policy is used to minimize the occurrence of systemic risk in the financial system. This study aims to measure the effectiveness of macroprudential policy instruments to mitigate the impact of fluctuations in capital flows to the movement of private sector credit cycle. The study also measures the effectiveness of macroprudential policy instruments to mitigate the impact of fluctuations in the business cycle of the movement of private sector credit cycle. Macroprudential policy instruments consist of, the Loan to Value (LTV), the minimum reserve requirement (GWM), and GWM + Loan to Deposit Ratio (GWM + LDR). The analytical method used is Correction Error Vector Model (VECM). The data used is data time series starting in 1998.Q1 until 2016.Q. The empirical test results show that macroprudential policy instruments such as LTV and GWM + LDR effective to reduce the impact of capital flow to movements in the credit cycle. While the reserve requirement policy is not effective to mitigate the impact of capital flows on the credit cycle. Meanwhile, LTV policy, the reserve requirement and reserve requirement + LDR are not effective to mitigate the impact of the business cycle movement against the credit cycle.

Keywords: Macroprudential policy, Cycle Credit, Capital flow, Business Cycles, VECM

JEL Classification: E58, E51, F30, E32,

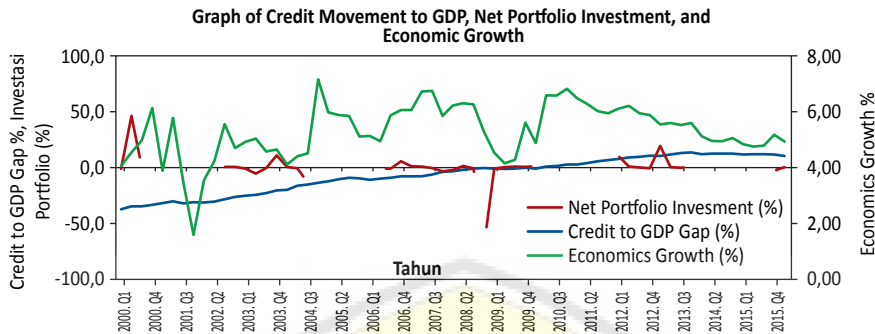
1. INTRODUCTION

Macroprudential policy was first introduced by Basel Committee on Banking Supervision. Macroprudential policy is the policy used to minimize systemic risks in financial systems (Baskaya, Giovanni, Kalemli-ozcan, Peydro, & Ulu, 2015; Claessens, Ghosh, & Mihet, 2013; Fendoğlu, 2015). Systemic risks arise due to the interconnectedness between financial institutions and the tendency of financial cycles to follow economic cycle (procyclical). The rate of growth of procyclical credit potentially has systemic risks toward banking systems. Arnold, Borio, Ellis, & Moshirian (2012); Bianchi, Liu, & Mendoza (2016) and Lopez, Tenjo, & Zarate (2014) conducted a study on the importance of early warning systems; that is, credit growth which is procyclical to the systemic risks. The significance of prudential action against systemic risks on procyclical credit becomes an important part of the Central Bank to maintain financial system stability (FSS).

Rubio & Carrasco-Gallego (2014) and Gomez-Gonzalez, Jose Eduardo et al. (2015) argue that credit growth indicators are an important part in understanding the financial cycle and its impacts on financial system stability (FSS). This is confirmed by studies conducted by Karfakis (2013) and Bahadir & Gumus (2016) finding that credit growth tends to be procyclical toward economic growth. The linkage of credit cycle and economic growth is an important part as an indicator of the occurrences of a systemic risk in financial systems. Arnold et al. (2012) and Tomuleasa (2015) emphasize the importance of macroprudential policy to mitigate systemic risks occurred interconnectedly or procyclically. Studies by Tovar, Garcia - escribano, & Martin (2012) and Shi, Jou, & Tripe (2014) mention that macroprudential policy is used to mitigate the occurrence of systemic risks through a number of sources such as procyclical credit growth, liquidity risk and rate of capital inflows. Each macroprudential policy instrument has its own direction and pattern to mitigate the sources of systemic risks. Several macroprudential policy instruments being developed by Bank Indonesia, especially to prevent the occurrence of systemic risks of procyclical credit growth, are countercyclical capital buffer (CCB), loan to value (LTV), minimum reserve requirement (GWM), and GWM + loan to deposit Ratio (GWM + LDR).

LTV macroprudential policy instrument is used to curb credit growth in the property and motor vehicle sectors (Kiley & Sim, 2015; Cronin & McQuinn, 2016). Reserve requirement (GWM) is the minimum amount of fund obligatorily kept by the amount set by Bank Indonesia as much as percentage of third party funds. Afterwards, Bank Indonesia improves microprudential policy instrument of GWM into GWM+LDR. Loan to Deposit Ratio (LDR) is an addition to the improvement of macroprudential policy instruments that direct to credit ratio given to third parties in Rupiah and foreign currency. Furthermore, GWM+LDR is the minimum deposit that must be maintained by bank in the form of balance in Giro Account at Bank Indonesia as much as DPK calculated based on LDR (Ginting et al., 2013). GWM+LDR policy is a macroprudential policy instrument aimed at reducing the rate of procyclical credit growth. Currently, Bank Indonesia is developing macroprudential policy instruments in the form of CCB to reduce the movement of procyclical credit cycles (Auer & Ongena, 2016; Basten & Koch, 2015). CCB is a macroprudential policy instrument intended to lessen procyclical credit cycle by tightening credit flow when economy increases and to loosen credit growth when economy experiences a recession.

Figure 1 describes the movement of Credit to GDP Gap, Net Portfolio Investment and Economic Growth from 2000.Q1 until 2016.Q1. The movement of economic growth fluctuates from 2000. Q1 through 2016. Q1. Economic growth experiences a relative correction in 2001. Q4 is 1.56% and increases again in 2002. Q3 is 5.55% with average economic growth from 2000. Q1 through 2016. Q1 is 5.30%. The decline in economic growth in 2001. Q4 is due to the impact of crisis recovery in 1997/1998. Economic growth again declines in 2009. Q2 is 4.14% caused by the monetary crisis in 2008. The financial crisis of 2008 is followed by a decline in portfolio investment in 2008. Q4 is -72.09%. Portfolio investment moves to fluctuate from 2001. Q1 through 2016. Q1 with an average value of -0.24%. The credit growth cycle begins in 2000. Q1 through 2016. Q1 tends to follow economic growth cycle (procyclical) and portfolio investment cycle. This is seen from the growing trend of credit to GDP from year to year. Procyclical credit growth has the potential of systemic risks to the financial systems.



Source: International Financial Statistics and the Bank for International Settlement

Figure 1. Landscape Movement of Credit to GDP Gap, Net Portfolio Investment and Economic Growth from 2000. Q1 to Q1 2016

The studies of macroprudential policy effectiveness in mitigating systemic risks, especially on credit growth that behaves procyclically, continue to grow, particularly in Indonesia. Empirical studies conducted by Pramono et al. (2015); Purnawan & M. Abd. Nasir (2015) and Utari G.A. Diah, Arimurti Trinil (2012) found that countercyclical capital buffer (CCB) policy, reserve requirement (GWM), and GWM+loan to deposit ratio (GWM+LDR) have a significant effect to mitigate excessive credit growth in Indonesia. This is in line with studies conducted by Drehmann & Tsatsaronis (2014) and Fendoğlu (2017) that found that macroprudential policy of countercyclical capital buffer (CCB) and loan to value (LTV) policies can be used to mitigate the impacts of capital flow on credit growth in countries with Emerging Market. The empirical studies conducted by Benes & Kumhof (2015) and Gambacorta & Murcia (2017) confirm that in addition to mitigating the impacts of capital flow on credit cycle, macroprudential policies can effectively mitigate the impacts of business cycle on credit growth. Similarly, Gómez, Lizarazo, & Carlos (2017) found that macroprudential policies through dynamic provisions and countercyclical reserve requirement are effective in reducing credit growth in Colombia.

In contrast, empirical study conducted by Tovar et al. (2012) found that macroprudential policy instrument in the form of reserve requirement (GWM) is less effective to reduce excessive credit growth in Colombia. Meanwhile, study by McCarthy & McQuinn (2015) in Ireland found that macroprudential policy instrument by loan to value (LTV) is effective in

mitigating systemic risks of excessive credit growth but less effective to manage to procyclical credit growth. The effectiveness of macroprudential policy instruments depends on the economic fundamentals and patterns of the country's own financial systems (Alegria, Alfaro, & Córdova, 2017; Claessens et al., 2013; Zhang & Zoli, 2016). This study is focused on several empirical questions. First, how is the effectiveness of macroprudential policy instruments to reduce the impacts of fluctuation in capital flow on credit cycle movement of private sector with some control variables such as monetary policy stance and macroeconomic variables? Second, how is the effectiveness of macroprudential policy instruments to reduce the impacts of business cycle fluctuation on credit cycle movement of private sector with some control variables such as monetary policy stance and macroeconomic variables. The use of macroprudential policy is limited to the instruments such as countercyclical capital buffer (CCB), loan to value (LTV), reserve requirement (GWM), and GWM + loan to deposit ratio (GWM + LDR) in controlling credit cycle of private sector.

Further, part 2 of this study describes several literature studies that explain the conceptual dimensions of systemic risk and financial system stability, macroprudential policies: instruments and targets and some previous studies. Section 3 describes types and sources of data and estimation techniques of the effectiveness model of macroprudential policy instruments and equations used to estimate the effectiveness of macroprudential policy instruments to mitigate the impacts of capital flow and business cycle on credit cycle movement of private sector. Section 4 describes the analysis of estimation results and discussions of empirical findings. Section 5 presents conclusions on the results of empirical findings and recommendations for Bank Indonesia, especially macroprudential policy board.

2. THEORY

2.1. Macroprudential policy: Instruments and Target

Macroprudential policy is a policy that is used to mitigate systemic risk in the financial system, both time series, and cross-sections. The macroprudential policy covers in terms of macro supervision in the financial system. The main target of macroprudential policy is the stability of the financial system (SSK) and preserving the financial system from systemic risk. Macroprudential

policy instruments are divided over the causes of the systemic risks that target procyclical (time series) and interconnected (cross-sections) (Corrado & Schuler, 2015; Rubio and Carrasco-Gallego, 2016). Procyclical the financial system is the behavior of the financial sector that exceeds the movement phase of economic growth. While interconnected the financial sector linkages to other financial at the same exposure. Galati and Moessner, (2014) is grouping macroprudential policy instruments based instruments and the dimensions of the source of systemic risk. As for the instruments and the dimensions of risk are presented in Table 1.

Table 1. Macroprudential policy: Instruments and Risk Dimensions

Risk Types	Risk Dimension: Time Series or Cross-Sections	
	Time Series:	Cross-Sections
Liquidity Risk	<ul style="list-style-type: none"> - Time Varying systemic liquidity surcharges - Levy on non-core liabilities - Time varying limit - Stressed VaR to build additional capital buffer against market risk during a boom 	<ul style="list-style-type: none"> - Capital Charges on derivative payables - Levy on non-core liabilities
Leverage/ credit/ asset price booms	<ul style="list-style-type: none"> - Countercyclical capital buffer - Time Varying LTV, Debt to Income (DTI) and loan to income (LTI) - Dynamic Provisioning - Rescaling risk- Weight by incorporating recessionary conditions in the probability of default assumptions (PDs) 	

Source: (Galati & Moessner, 2014)

Dimensions risk times series for the type of risk in the form of credit and asset prices can be used instrument in the form Countercyclical capital buffer (CCB), time varying LTV, Debt to income (DTI) and loan to income (LTI), Dynamic Provisioning and Weight risk- rescaling by incorporating recessionary conditions in the probability of defaults assumptions (PDs). CCB was used as additional capital reserves of banks as capital buffer amplifier when the loans (Drehmann, Borio, Gambacorta, Jiménez, and Trucharte, 2010). For liquidity risk macroprudential instruments used is a loan to deposit ratio (LDR). Some mathematical models of macroprudential policy instruments are as follows:

a. Instrument Loan to Value (LTV)

LTV policy is one of macroprudential policy is used to slow the rate of growth of housing loans and the property sector. LTV regulations directed to reduce the number by determining the amount of capital must specify particularly for motor vehicle loans. At a certain position can be determined amount of LTV mathematically as follows:

$$\frac{I}{I + I^P} \leq LTV \quad (1)$$

$$I^P \geq \frac{1 - LTV}{LTV} I (\lambda^{LTV}), \quad (2)$$

Where the $LTV < 1$ is the magnitude of the requirements of LTV, λ^{LTV} is Lagrange magnitude multiplier LTV. I^P indicates the amount of the loan amount of funds for various investment activities in the banking industry competition is not limited. So $I^P = 0$ and $LTV = 1$. The level of the low LTV shows a wedge between marginal productivity and the level of borrowing. So that the optimization that can be adjusted between productivity levels and the rate of the loan is the following:

$$A_{3g} F' \left[\left(1 + \frac{1 - LTV}{LTV} \right) I \right] - (1 + r^l) = \frac{\lambda^{LTV}}{\lambda_{3g}^{P,no-run}} \frac{1 - LTV}{LTV} \quad (3)$$

Then, if the condition of the LTV increases, the equation (3) is as follows:

$$\lambda_1^P = a A_{3g} \left[\left(1 + \frac{1 - LTV}{LTV} \right) I \right]^{a-1} \lambda_{3g}^{P,no-run} + \xi \sum_S \lambda_{3S}^{P,run} + \lambda^{LTV} \quad (4)$$

When the price of P from the low loan, the risk borne by banks increased. LTV scale settings will affect the risk borne by banks.

b. Instruments Reserve Requirement

Reserve Requirement policy is one of macroprudential policy instruments that lead to goal setting bank capital reserves. Banking capital arrangements require banks to hold capital reserves a certain percentage of equity for each unit of risk. The equation specified banking capital requirements by certain capital limits are as follows:

$$CR \cdot I \leq E^B + P_{eq}^B x_{eq}^R (\lambda^{CR}), \quad (5)$$

where CR is the capital requirements, (λ^{CR}) is a multiplier on the Lagrange constraints. Capital The capital arrangements based on risk-weighted assets so no capital costs for liquid assets without risk, so the risk weighting on loans is equal to one. Capital arrangements, closely related to the behavior of banks. The following equations define all mutual a slice capital arrangements with banking behavior. The equation is as follows:

$$\sum_{s \notin S^D} \lambda_{3S}^{B, no-run} [V'_{3S} (1 + r^l) - (1 + r_3^D)] = \lambda^{CR} CR \frac{EQ}{E^B} > 0. \quad (6)$$

The need for stringent bank capital reduce the willingness of banks to take excessive risks. In this condition, will encourage investment to fall because of the decline of banking intermediation. $LIQ_1 = \delta \cdot D^R$ and $D^R = \frac{l - EQ}{1 - \delta}$ into the equation as follows:

$$q = \left(1 - \delta - \xi \frac{1 - \delta}{1 - CR} \right)^2 \quad (7)$$

Through the equation (6) the higher capital requirements reduce the probability of a bank run. The high capital reserves Banks will minimize the risk of failure.

3. METODOLOGI

3.1. Estimation Technique

The data used in this study used secondary data time series. The period of data used is the quarter from Q1 1999 to Q1 2016. Macroprudential policy instruments consist of Loan to Value (LTV), the minimum reserve requirement (GWM), and GWM + loan to deposit ratio (LDR + GWM). Capital flow proxies by using net portfolio investment as a credit while proxies by using total credit gap to GDP (gross domestic product) as measured by the private sector using the Hodrick-Prescott filter. The control variables used is the stance of monetary policy that consists of the interest rate policy of Bank Indonesia (BI rate), real economic growth and real exchange rate. Data macroprudential policy instruments using dummy variables CCB, LTV, GWM, and GWM + LDR obtained from Bank Indonesia. Data credit gap to GDP and the real exchange rate obtained from Bank for International Settlements (BIS). Data net portfolio investment interest rate policy of Bank Indonesia (BI) and real economic growth obtained from international financial statistics (IFS).

The analytical method used is the Vector Error Correction Model (VECM) to determine the effectiveness of policy instruments macroprudential to cushion the impact of capital flows to the private sector credit cycle fluctuations by adding variable shocks BI rate, real GDP and the real exchange rate. In addition, the use VECM is used to determine the effectiveness of policy instruments to reduce the impact cycle macroprudential business against cyclical fluctuations of private sector credit by adding variable BI rate shocks, the investment portfolio, and the real exchange rate. VECM is a derivative form of the basic model equation Autoregressive Vector (VAR) (Oanea, 2015; Thierry, June, and Doumbe, 2016). The shape of the base of the VECM equation is as follows:

$$\Delta y_t = \Pi y_{t-1} + \Gamma y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + \mu_t \quad (8)$$

Where:

$$\Pi = -(I_k - A_1 - \dots - A_p) \quad (9)$$

And

$$\Gamma_i = -(A_{i+1} + \dots + A_p), \quad i = 1, \dots, p - 1 \quad (10)$$

Observation matrix $K \times K$ from a rank r it will produce two matrix is $K \times r$. Fill α and β in two matrices $K \times r$ in the rank of r so that it becomes $\Pi = \alpha\beta'$. Further, substitution $\Pi = \alpha\beta'$ in the equation (8), it will be the VECM equation with a correction of coefficients Error Correction Term (ECT) as follows:

$$\Delta y_t = \alpha\beta' y_{t-1} + \Gamma_1 y_{t-1} + \dots + \Gamma_{p-1} \Delta y_{t-p+1} + \mu_t \quad (11)$$

Equation (10) is a model VECM by incorporating elements of ECT on the model (Kuo, 2016). Γy_{t-1} is the range of a variable matrix r and n . The VECM method enables to find the amount of the significance of a model with the restriction process on the model. Expansion of VECM allows searching magnitude and response contributions between variables.

3.2. Empirical Model

Specification empirical model using research conducted by Fendoğlu (2017) and Gambacorta & Murcia (2017) by modifying the macroprudential policy instruments and variable shock model. To search for macroprudential policy effectiveness in mitigating the impact of capital flows on the credit cycle can be translated into the estimation equation using the Vector Error Correction Model (VECM). The equation method VECM model policies macroprudential to mitigate the impact of capital flow to movements in the credit cycle are as follows:

- a. Model macroprudential policy to mitigate the impact of capital flow to movements in the credit cycle

$$\begin{aligned} \Delta Cgap_t = & \Gamma_{10} + \Gamma_{11} \Delta Cgap_{t-1} + \Gamma_{12} \Delta MaP_{t-1} + \Gamma_{13} \Delta MaP_{t-1} * PFLOWS_{t-1} \\ & + \Gamma_{14} \Delta PFLOWS_{t-1} + \Gamma_{15} \Delta Bbrate_{t-1} + \Gamma_{16} \Delta GDP_{t-1} + \Gamma_{17} \Delta RER_{t-1} \\ & + \alpha_1 (Cgap_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\ & Bbrate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{1t} \end{aligned} \quad (12)$$

$$\begin{aligned} \Delta MaP_t = & \Gamma_{10} + \Gamma_{21} \Delta Cgap_{t-1} + \Gamma_{22} \Delta MaP_{t-1} + \Gamma_{23} \Delta MaP_{t-1} * PFLOWS_{t-1} \\ & + \Gamma_{24} \Delta PFLOWS_{t-1} + \Gamma_{25} \Delta Bbrate_{t-1} + \Gamma_{26} \Delta GDP_{t-1} + \Gamma_{27} \Delta RER_{t-1} \\ & + \alpha_2 (MaP_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\ & Bbrate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{2t} \end{aligned} \quad (13)$$

$$\begin{aligned}
 \Delta MaP_t * PFLOWS_t &= \Gamma_{30} + \Gamma_{31} \Delta Cgap_{t-1} + \Gamma_{32} \Delta MaP_{t-1} + \Gamma_{33} \Delta MaP_{t-1} * PFLOWS_{t-1} \\
 &+ \Gamma_{34} \Delta PFLOWS_{t-1} + \Gamma_{35} \Delta BRate_{t-1} + \Gamma_{36} \Delta GDP_{t-1} + \Gamma_{37} \Delta RER_{t-1} \\
 &+ \alpha_3 (MaP_{t-1} * PFLOWS_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + \\
 &PFLOWS_{t-1} + BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{3t}
 \end{aligned} \tag{14}$$

$$\begin{aligned}
 \Delta PFLOWS_t &= \Gamma_{40} + \Gamma_{11} \Delta Cgap_{t-1} + \Gamma_{42} \Delta MaP_{t-1} + \Gamma_{43} \Delta MaP_{t-1} * PFLOWS_{t-1} \\
 &+ \Gamma_{44} \Delta PFLOWS_{t-1} + \Gamma_{45} \Delta BRate_{t-1} + \Gamma_{46} \Delta GDP_{t-1} + \Gamma_{47} \Delta RER_{t-1} \\
 &+ \alpha_4 (PFLOWS_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{4t}
 \end{aligned} \tag{15}$$

$$\begin{aligned}
 \Delta BRate_t &= \Gamma_{50} + \Gamma_{51} \Delta Cgap_{t-1} + \Gamma_{52} \Delta MaP_{t-1} + \Gamma_{53} \Delta MaP_{t-1} * PFLOWS_{t-1} \\
 &+ \Gamma_{54} \Delta PFLOWS_{t-1} + \Gamma_{55} \Delta BRate_{t-1} + \Gamma_{56} \Delta GDP_{t-1} + \Gamma_{57} \Delta RER_{t-1} \\
 &+ \alpha_5 (BRate_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{5t}
 \end{aligned} \tag{16}$$

$$\begin{aligned}
 \Delta GDP_t &= \Gamma_{60} + \Gamma_{61} \Delta Cgap_{t-1} + \Gamma_{62} \Delta MaP_{t-1} + \Gamma_{63} \Delta MaP_{t-1} * PFLOWS_{t-1} \\
 &+ \Gamma_{64} \Delta PFLOWS_{t-1} + \Gamma_{65} \Delta BRate_{t-1} + \Gamma_{66} \Delta GDP_{t-1} + \Gamma_{67} \Delta RER_{t-1} \\
 &+ \alpha_6 (GDP_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{6t}
 \end{aligned} \tag{17}$$

$$\begin{aligned}
 \Delta RER_t &= \Gamma_{70} + \Gamma_{11} \Delta Cgap_{t-1} + \Gamma_{72} \Delta MaP_{t-1} + \Gamma_{73} \Delta MaP_{t-1} * PFLOWS_{t-1} \\
 &+ \Gamma_{74} \Delta PFLOWS_{t-1} + \Gamma_{75} \Delta BRate_{t-1} + \Gamma_{76} \Delta GDP_{t-1} + \Gamma_{77} \Delta RER_{t-1} \\
 &+ \alpha_7 (RER_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{7t}
 \end{aligned} \tag{18}$$

Then, to find the effectiveness of macroprudential policies to mitigate the impact of the business cycle of the credit cycle can be translated into estimates into the equation by using VECM as following:

- b. Model macroprudential policy to mitigate the impact of business cycles on the movement of the credit cycle

$$\begin{aligned}
 \Delta Cgap_t &= \Gamma_{10} + \Gamma_{11} \Delta Cgap_{t-1} + \Gamma_{12} \Delta MaP_{t-1} + \Gamma_{13} \Delta MaP_{t-1} * GDP_{t-1} \\
 &+ \Gamma_{14} \Delta PFLOWS_{t-1} + \Gamma_{15} \Delta BRate_{t-1} + \Gamma_{16} \Delta GDP_{t-1} + \Gamma_{17} \Delta RER_{t-1} \\
 &+ \alpha_1 (Cgap_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{1t}
 \end{aligned} \tag{19}$$

$$\begin{aligned}
 \Delta MaP_t &= \Gamma_{10} + \Gamma_{21} \Delta Cgap_{t-1} + \Gamma_{22} \Delta MaP_{t-1} + \Gamma_{23} \Delta MaP_{t-1} * GDP_{t-1} \\
 &+ \Gamma_{24} \Delta PFLOWS_{t-1} + \Gamma_{25} \Delta BRate_{t-1} + \Gamma_{26} \Delta GDP_{t-1} + \Gamma_{27} \Delta RER_{t-1} \\
 &+ \alpha_2 (MaP_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLOWS_{t-1} + PFLOWS_{t-1} + \\
 &BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{2t}
 \end{aligned} \tag{20}$$

$$\begin{aligned} \Delta MaP_t * GDP_t = & \Gamma_{30} + \Gamma_{31} \Delta Cgap_{t-1} + \Gamma_{32} \Delta MaP_{t-1} + \Gamma_{33} \Delta MaP_{t-1} * GDP_{t-1} \\ & + \Gamma_{34} \Delta PFLows_{t-1} + \Gamma_{35} \Delta BRate_{t-1} + \Gamma_{36} \Delta GDP_{t-1} + \Gamma_{37} \Delta RER_{t-1} \\ & + \alpha_3 (MaP_{t-1} * PFLows_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLows_{t-1} + \\ & PFLows_{t-1} + BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{3t} \end{aligned} \quad (21)$$

$$\begin{aligned} \Delta PFLows_t = & \Gamma_{40} + \Gamma_{41} \Delta Cgap_{t-1} + \Gamma_{42} \Delta MaP_{t-1} + \Gamma_{43} \Delta MaP_{t-1} * GDP_{t-1} \\ & + \Gamma_{44} \Delta PFLows_{t-1} + \Gamma_{45} \Delta BRate_{t-1} + \Gamma_{46} \Delta GDP_{t-1} + \Gamma_{47} \Delta RER_{t-1} \\ & + \alpha_4 (PFLows_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLows_{t-1} + PFLows_{t-1} + \\ & BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{4t} \end{aligned} \quad (22)$$

$$\begin{aligned} \Delta BRate_t = & \Gamma_{50} + \Gamma_{51} \Delta Cgap_{t-1} + \Gamma_{52} \Delta MaP_{t-1} + \Gamma_{53} \Delta MaP_{t-1} * GDP_{t-1} \\ & + \Gamma_{54} \Delta PFLows_{t-1} + \Gamma_{55} \Delta BRate_{t-1} + \Gamma_{56} \Delta GDP_{t-1} + \Gamma_{57} \Delta RER_{t-1} \\ & + \alpha_5 (BRate_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLows_{t-1} + PFLows_{t-1} + \\ & BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{5t} \end{aligned} \quad (23)$$

$$\begin{aligned} \Delta GDP_t = & \Gamma_{60} + \Gamma_{61} \Delta Cgap_{t-1} + \Gamma_{62} \Delta MaP_{t-1} + \Gamma_{63} \Delta MaP_{t-1} * GDP_{t-1} \\ & + \Gamma_{64} \Delta PFLows_{t-1} + \Gamma_{65} \Delta BRate_{t-1} + \Gamma_{66} \Delta GDP_{t-1} + \Gamma_{67} \Delta RER_{t-1} \\ & + \alpha_6 (GDP_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLows_{t-1} + PFLows_{t-1} + \\ & BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{6t} \end{aligned} \quad (24)$$

$$\begin{aligned} \Delta RER_t = & \Gamma_{70} + \Gamma_{71} \Delta Cgap_{t-1} + \Gamma_{72} \Delta MaP_{t-1} + \Gamma_{73} \Delta MaP_{t-1} * GDP_{t-1} \\ & + \Gamma_{74} \Delta PFLows_{t-1} + \Gamma_{75} \Delta BRate_{t-1} + \Gamma_{76} \Delta GDP_{t-1} + \Gamma_{77} \Delta RER_{t-1} \\ & + \alpha_7 (RER_{t-1} + MaP_{t-1} + MaP_{t-1} * PFLows_{t-1} + PFLows_{t-1} + \\ & BRate_{t-1} + GDP_{t-1} + RER_{t-1}) + \varepsilon_{7t} \end{aligned} \quad (25)$$

$\Delta Cgap_t$ is a credit to GDP, MaP_t is macroprudential policy. The macroprudential policy consists of three instruments that LTV, the reserve requirement, and reserve requirement + LDR. The model is used adjusted on a quarterly basis macroprudential policy instruments. $MaP_t * PFLows_t$ macroprudential policy multiplied by capital flows. $MaP_t * GDP_t$ is multiplied macroprudential policy of economic growth, $PFLows_t$ is capital flow, $BRate_t$ is the policy rate in the BI rate, GDP_t growth and is the RER_t is the real exchange rate.

Table 2. Description, Units, Resources and Relationships Variable

Variable	Description, Units, Sources	Relations
$CGAP_t$	<ul style="list-style-type: none"> - Credit/ GDP Gap is the total private sector credit per GDP calculated using HP filter. - Unit% - Source: Bank for International Settlements (BIS) 	(- / +)
GDP_t	<ul style="list-style-type: none"> - Gross Domestic Product Real is the value of goods and services produced by a country, calculated at constant (2010) - Units% - Source: International Financial Statistics (IFS) 	(- / +)
$PFLWS_t$	<ul style="list-style-type: none"> - Net investment portfolio is the difference between the amount of portfolio investment inflow is reduced by the amount of portfolio investment outflow - Unit% - Source: International Financial Statistics (IFS) 	(- / +)
$Blrate_t$	<ul style="list-style-type: none"> - Rate Policy of Bank Indonesia (BI) is interest rate policy of Bank Indonesia and used as a monetary policy instrument - Unit% - Source: International Financial Statistics (IFS) 	(- / +)
RER_t	<ul style="list-style-type: none"> - Real effective exchange rate is the real exchange rate that has been adjusted to the price of goods trading partner of other countries - Unit: Index - Source: International Financial Statistics (IFS) 	(- / +)
LTV_t	<ul style="list-style-type: none"> - Dummy macroprudential policy Loan to Value - D = 0, before the policy is applied - D = 1, After the policy is applied - Source: Bank Indonesia 	(- / +)
GWM_t	<ul style="list-style-type: none"> - Dummy Policy macroprudential Statutory - D = 0, before the policy is applied - D = 1, After the policy is applied - Source: Bank Indonesia 	(- / +)
GWM_LDR_t	<ul style="list-style-type: none"> - Dummy Policy macroprudential Statutory + Loan to Deposit Ratio - D = 0, before the policy is applied - D = 1, After the policy is applied - Source: Bank Indonesia 	(- / +)

4. RESULTS AND ANALYSIS

The results of the analysis of the effectiveness of policy instruments macroprudential for mitigate the impact of capital flows and business cycles on the movement of private sector credit in the premises carried out in several stages. First, determine the appropriate empirical models with the goal of macroprudential policy instruments of the credit growth. It does by combining concepts, empirical phenomena and does decrease the specification models with Vector Error correction model (VECM). The Second, present results VECM estimation of some macroprudential policy instruments to

curb capital flows and business cycles to the cycle of private sector credit. VECM estimation results are divided into several empirical models. VECM estimation results are used to see the significance between dependent and independent variables were arranged. Third, analyze test results Impulse Response Function and Variance Decomposite on any macroprudential policy instruments. This is done to see the response of surprise among variables in the empirical model.

4.1. Loan to Value (LTV) Policy: *Procyclical Capital flow and Credit Cycle*

Testing VECM empirical models used to see the significance of macroprudential policy instruments such as LTV to cushion the impact of capital flows on the credit cycle and variable shocks monetary policy stance, Gross Domestic Product, real effective exchange rate. VECM estimation results of macroprudential policy instruments such as LTV to mitigate the impact of capital flows on the credit cycle is presented in Table 3. Based on estimates VECM short-term models indicate that LTV macroprudential policy instruments can effectively mitigate the impact of capital flows to the private sector credit cycles both in lag the first and second with $\alpha = 5\%$. Large coefficient LTV macroprudential policy instruments at lag 1 and lag 2 is equal to -0.20 and -0009 with a probability value of each of 0000 and 0019. Variable in the form of credit to GDP significant affect the variable itself at lag 1 with a coefficient of -0597.

The long-term analysis shows that the monetary policy of the Central Bank in the form of BI rate (BI rate), GDP and the exchange rate significantly influence the credit cycle with value coefficient of 1.040, 47 727 and -2780. Cointegration models use the equation 1 (CointEq1) has consequences on the value of AIC Akaike and Schwarz IC for each da -1 580 -2 221 low when compared with the model cointegration in Equation 4 and 3 (CointEq3 and CointEq4). This leads to the consequence used model. VECM estimation test results on macroprudential instruments such as LTV can be said to the long-term balance. It is seen by the ECT (Error Correction Term) negative (-). Based on estimates as a whole can be said that the only policy instrument that significantly LTV to curb capital flow to the credit cycle and variable lag of credit to GDP that affect the variable itself on cointegration equation 1(CointEq1)

Table 3. VECM Estimation Result on Macroprudential Loan to Value (LTV) Policy Instrument Model to Mitigate the Effect of Capital Flow on Credit Cycle Movement

Long Term				
Variable	CointEq1	CointEq2	CointEq3	CointEq4
DBI_RATE(-1)	1.04	1.116	1.326	0.566
DGDP(-1)	47.727	19.793	17.024	37.327
DRER(-1)	-2.78	-0.641	0.388	-3.232
C	0.871	-0.217	-0.62	0.437
Short Term				
Variable	D (DCGAP)	D(LTV)	D(LTV_FLOWS)	D(DFLOW)
CointEq ¹	0.022*	0.011	-0.697*	4.231
	[0.003]	[0.463]	[0.037]	[0.001]
CointEq ²	-0.080*	-0.034	2.731*	-5.605
	[0.000]	[0.411]	[0.005]	[0.108]
CointEq ³	0.029*	0.008	-1.180*	-0.691
	[0.000]	[0.560]	[0.000]	[0.559]
CointEq ⁴	0.001	0	-0.026	-2.341
	[0.577]	[0.997]	[0.806]	[0.000]
D(DCGAP(-1))	-0.597*	0.159	1.239	-5.662
	[0.000]	[0.598]	[0.857]	[0.821]
D(DCGAP(-2))	0.084	0.359	6.069	-46.172
	[0.444]	[0.096]	[0.218]	[0.010]
D(LTV(-1))	0.082	-0.019	-1.348	1.655
	[0.293]	[0.900]	[0.702]	[0.897]
D(LTV(-2))	0.032	-0.068	-2.577	2.779
	[0.688]	[0.661]	[0.468]	[0.829]
D(LTV_FLOWS(-1))	-0.020*	-0.005	0.165	0.245
	[0.000]	[0.663]	[0.521]	[0.793]
D(LTV_FLOWS(-2))	-0.009*	-0.002	0.11	0.124
	[0.019]	[0.782]	[0.525]	[0.843]
D(DFLOW(-1))	-0.001	0	0.035	0.688*
	[0.690]	[0.974]	[0.657]	[0.017]
D(DFLOW(-2))	0	0	0.035	0.207
	[0.580]	[0.808]	[0.380]	[0.147]
D(DBI_RATE(-1))	0.019	-0.021	-0.66	0.228
	[0.270]	[0.537]	[0.405]	[0.937]
D(DBI_RATE(-2))	0.007	0.011	0.169	2.305
	[0.413]	[0.531]	[0.665]	[0.104]
D(DGDP(-1))	-0.027	0.023	0.452	5.773
	[0.178]	[0.558]	[0.619]	[0.081]
D(DGDP(-2))	-0.005	0.013	0.428	4.279*
	[0.687]	[0.606]	[0.467]	[0.046]
D(DRER(-1))	0	0.002	-0.002	0.053
	[0.903]	[0.829]	[0.993]	[0.936]
D(DRER(-2))	0.005	0.003	0.07	-0.104
	[0.075]	[0.603]	[0.585]	[0.824]
C	0.044*	0.002	-0.128	1.12
	[0.000]	[0.942]	[0.802]	[0.545]
Akaike AIC	-2.221	-0.856	5.4	7.979
Schwarz SC	-1.58	-0.215	6.041	8.62

Significant at the level * 5 %

Then after seeing the significance VECM models empirical test results, further analysis Impulse Response Function (IRF). Impulse Response Function is one step in a VECM analysis which aims to see the response of the dependent variable due to the shocks of the independent variables in a given period. The results of the analysis of Impulse Response Function Model policy instrument Loan to Value (LTV) to mitigate the impact of capital flow to movements in the credit cycle is shown in Figure 2. Overall macroprudential policy instruments such as LTV and variable shocks BI Rate, GDP and the exchange rate responds to movement the credit cycle in Indonesia. A change in the policy shock variable LTV and requires a relatively long time span in the variables to be at a point equilibrium. LTV policy response to changes in credit occurred at the beginning of the period to over the period of the 30th. LTV policy response to cushion the impact of capital flows on the credit cycle occurs in the 3rd period to exceed the period of the 30th with a positive direction. Response capital flow to movements in the credit cycle occurred during the 2nd through a 10th period. Response capital flows find equilibrium points in the period to 10 with a movement towards the positive and negative. BI policy response rate, GDP and value exchange rate against the movement of the credit cycle occurs at the beginning of the period to exceed the period of the 30th. Response rate and the GDP of the business cycle moves negatively, while the in positive BI rate.

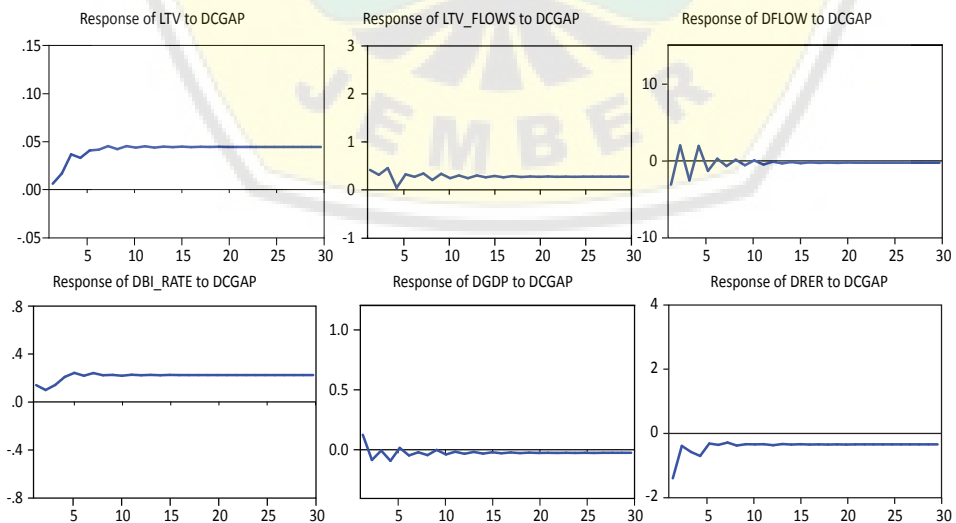


Figure 2. Impulse Response Function Model policy instrument Loan to Value (LTV) to mitigate the impact of capital flow to movements in the credit cycle

After analyzing Impulse Response function, the next step is to test the Variance Decomposition (VD). VD test is used to look at the contribution changes macroprudential policy instruments such as LTV and variable shocks BI rate, GDP and the exchange rate to changes in the credit cycle. VD test results on the model of LTV policy instruments to mitigate the impact of capital flow to movements in the credit cycle is presented in Table 4. Variable macroprudential policy instruments such as LTV_FLOWS have the greatest contributed in mitigating the impact of capital flow to movements in the credit cycle with a value of 34 456% in the period to 30, Macroprudential policy instruments such as LTV also provides the greatest contribution to changes in the credit cycle with a value of 2,709% in the period to 30th. While the interest rate of the Central Bank in the form of BI rate has almost the same contribution to the policy that is equal to 2,593% LTV. While capital flows, GDP, and the exchange rate has a weak contribution to the movement of the credit cycle in Indonesia.

Table 4. Results Variance Decomposition in Policy Instrument Model Loan to Value (LTV) To Mitigate Impact of Capital Flows to Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	LTV	LTV_FLOWS	DFLOW	DBI_RATE	DGDP	DRER
1	0.07	100	0	0	0	0	0	0
5	0.171	64.415	3.028	27.073	0.294	2.159	1.621	1.405
10	0.258	60.03	2.825	32.071	0.352	2.372	1.48	0.867
20	0.377	58.551	2.736	33.886	0.345	2.545	1.285	0.649
30	0.467	58.086	2.709	34.456	0.341	2.593	1.228	0.584

4.2. Reserves Requirements (GWM) Policy: *Procyclical Capital flow and the Credit Cycle*

Testing VECM empirical models used to see the significance of macroprudential policy instruments in the form of statutory reserves to cushion the impact of capital flows on the credit cycle and variable shocks monetary policy stance, Gross Domestic Product, real effective exchange rate. VECM estimation results of macroprudential policy instruments such as reserve requirement to mitigate the impact of capital flows on the credit cycle are presented in Table 5. Based on estimates VECM short-term models indicate that GWM macroprudential policy instruments are not effective in reducing the impact

of capital flows to the private sector credit cycle. This is indicated by the three models lack a bona fide cointegration significant influence. Variable credit to GDP has influence significant against it self the change of credit to GDP with a coefficient of -0349.

The long-term analysis shows that the monetary policy of the Central Bank in the form of capital flows, BI rate (BI rate), GDP and the exchange rate significantly influence the credit cycle with a coefficient of 0504, 2159, 12 351 and 1121. The use of models cointegration in equation 1 (CointEq1) has consequences on the value of AIC Akaike and Schwarz IC for each -1939 and 1571 were lower compared with the model cointegration in Equation 3 and 2 (CointEq3 and CointEq2). This leads to the consequence used model. VECM estimation test results on macroprudential instruments such as reserve requirement can be said towards balance short term. It is seen by the ECT (Error Correction Term) were negative (+). Based on estimates as a whole can be said that only the reserve requirement policy instruments are not significant to curb capital flow to the credit cycle.

GWM policy geared to put the brakes on credit growth by increasing banks' capital reserves at the Bank premises in good shape and the rupiah currency. Corresponding empirical test results show that the increase in the reserve requirement is less effective in halting the rapid capital flows to the credit cycle. This is because the cycle of movement is affected by the strong credit of the financial cycle that follows the phase of economic growth.

Then after seeing the significance of the results of empirical test VECM models, further analysis Impulse Response Function (IRF). Impulse Response Function is one step in a VECM analysis which aims to see the response of the dependent variable due to the shocks of the independent variables in a given period. The results of the analysis of Impulse Response Function Model GWM policy instruments to mitigate the impact of capital flow to movements in the credit cycle is shown in Figure 3. Overall macroprudential policy instruments such as reserve requirement and variable shocks BI Rate, GDP and the exchange rate is less a response to movements in the credit cycle Indonesia. The change in the reserve requirement policy and variable shock requires a relatively long time span in the variables to be at a point equilibrium. GWM_FLOW policy response to changes in the credit provides a weak response to curb the impact of capital flows to changes in the credit

**Table 5. Estimation Results VECM in Model Instrument Policy (GWM)
To Mitigate Impact of Capital Flow to Credit**

Long Term			
Variable	CointEq1	CointEq2	CointEq3
DFLOW(-1)	0.504	0.082	-0.655
DBI_RATE(-1)	2.159	0.636	46.416
DGDP(-1)	12.351	-1.837	-166.395
DRER(-1)	1.121	1.288	114.029
C	0.191	-0.924	-84.402
Short Term			
Variable	D(DCGAP)	D(GWM)	D(GWM_FLOWS)
CointEq ¹	0.002	-0.001	-0.158
	[0.226]	[0.587]	[0.500]
CointEq ²	0.004	0.028	3.216
	[0.828]	[0.345]	[0.209]
CointEq ³	0.000	0.000	-0.040
	[0.803]	[0.270]	[0.154]
D(DCGAP(-1))	-0.349*	0.101	8.276
	[0.002]	[0.565]	[0.586]
D(GWM(-1))	-0.086	-0.427	-49.234
	[0.905]	[0.700]	[0.607]
D(GWM_FLOWS(-1))	0.002	0.005	0.527
	[0.823]	[0.707]	[0.634]
D(DFLOW(-1))	0.000	-0.001	-0.069
	[0.790]	[0.641]	[0.598]
D(DBI_RATE(-1))	-0.017	0.004	0.282
	[0.085]	[0.787]	[0.827]
D(DGDP(-1))	-0.028*	0.004	0.604
	[0.048]	[0.849]	[0.749]
D(DRER(-1))	-0.005	0.000	0.088
	[0.129]	[0.993]	[0.852]
C	0.041*	0.012	1.201
	[0.000]	[0.484]	[0.427]
Akaike AIC	-1.939	-1.060	7.858
Schwarz SC	-1.571	-0.692	8.226

Significant at the level * 5%

cycle. GWM response macroprudential policy instruments also have a weak response to changes in credit. The response rate of the Central Bank in the form of central bank policy rate, capital flow GDP, and the exchange rate has a weak response to changes in credit.

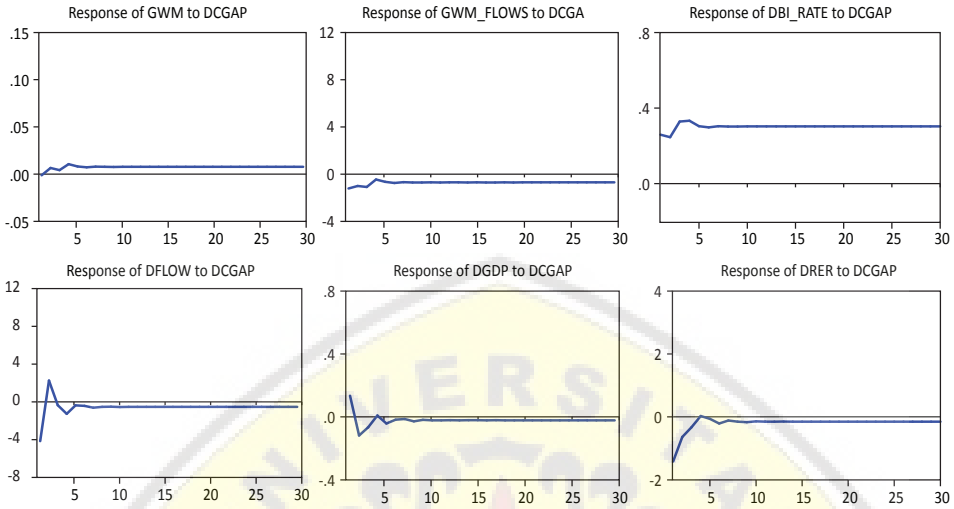


Figure 3. Impulse Response Function Model Statutory policy instrument (GWM) to mitigate the impact of capital flow to movements in the credit cycle

After analyzing Impulse Response Function, the next step is to test the Variance Decomposition (VD). VD test is used to look at the contribution changes macroprudential policy instruments such as reserve requirement and variable shocks BI rate, GDP and the exchange rate to changes in the credit cycle. VD test results on the model of the reserve requirement policy instruments to mitigate the impact of capital flow to movements in the credit cycle is presented in Table 6. Variable macroprudential policy instruments such as GWM_FLOWS have the greatest contributions in mitigating the impact of capital flow to movements in the credit cycle with a value of 3,508% in the period to 30, While other variables such as reserve requirement policy, capital flows, the BI rate, GDP da exchange rate have a relatively small contribution to the change in the credit cycle in Indonesia.

Table 6. Results Variance Decomposition In Model Statutory Instrument Policy (GWM) To Mitigate Impact of Capital Flow Against The movement of Cycle Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	GWM	GWM FLOWS	DFLOW	DBI_RATE	DGDP	DRER
1	0.084	100	0	0	0	0	0	0
5	0.145	92.973	0.726	2.292	1.404	0.669	1.547	0.385
10	0.195	92.719	0.517	2.905	1.165	0.912	1.48	0.299
20	0.268	92.511	0.396	3.349	1.059	1.031	1.403	0.248
30	0.326	92.439	0.353	3.508	1.02	1.074	1.373	0.229

4.3. GWM+LDR Policy: Proccyclical Capital flow and Credit Cycle

VECM empirical test results provide a snapshot of how the effectiveness of macroprudential instruments such GWM + LDR policy to mitigate the impact of capital flows to changes in the credit cycle. Table 7. Presenting the results of the estimated VECM model GWM + LDR policy to mitigate the impact of capital flow to movements in the credit cycle. Based on estimates of short-term VECM indicates that macroprudential policy instruments GWM + LDR can effectively mitigate the impact of capital flows to the private sector credit cycle well in the first lag with a coefficient of -0009 with $\alpha = 5\%$. Increasing the amount of the GWM+LDR 1% will decrease the movement of 0.009% of the credit cycle, assuming other variables held constant. Variables in the form of credit to GDP significant affect the variable itself at lag 1 with a coefficient of -0369. Central Bank's interest rate policy in the form of the BI rate and GDP also has a significant impact on the credit cycle for each -0017 and -0028.

Then the test results VECM estimation on macroprudential instruments such as reserve requirement + LDR can be said to the long-term balance. It is seen by the ECT (Error Correction Term) negative (-). The long-term analysis shows that the monetary policy of the Central Bank in the form of BI rate (BI rate), GDP and the exchange rate significantly influence the credit cycle with value coefficient of 0932, 29 660, and -1324. Based on estimates as a whole can be said that the policy instruments GWM + LDR significant influence to curb capital flow to the credit cycle. The variable lag of credit to GDP that affects the variable itself on cointegration equation 1(CointEq1).In addition, BI variable rate and GDP also significantly affect the change in private sector credit cycle.

**Table 7. Estimation results VECM on Policy Model (GWM + LDR)
To Mitigate Impact of Capital Flow Movement to Credit**

Long Term				
Variable	CointEq1	CointEq2	CointEq3	CointEq4
DBI_RATE(-1)	0.932	0.481	0.225	1.89
DGDP(-1)	29.66	1.657	-0.728	-8.281
DRER(-1)	-1.324	0.988	1.619	1.506
C	0.095	-0.565	-0.761	0.093
Short Term				
Variable	D(DCGAP)	D(GWM_LDR)	D(GWM_LDR_FLOWS)	D(DFLOW)
CointEq ¹	0.003*	0.002	-0.118*	-0.793*
	[0.015]	[0.204]	[0.003]	[0.000]
CointEq ²	-0.019*	0.004	1.822*	2.277
	[0.051]	[0.793]	[0.000]	[0.158]
CointEq ³	0.014*	0	-1.313*	-0.658
	[0.020]	[0.962]	[0.000]	[0.488]
CointEq ⁴	0.002	0.002	0.029	-1.985
	[0.298]	[0.445]	[0.566]	[0.000]
D(DCGAP(-1))	-0.369*	-0.054	-4.604	5.199
	[0.001]	[0.753]	[0.231]	[0.770]
D(GWM_LDR(-1))	0.004	-0.032	-1.105	-1.662
	[0.964]	[0.810]	[0.709]	[0.904]
D(GWM_LDR_FLOWS(-1))	-0.009*	0	0.185	0.295
	[0.033]	[0.974]	[0.185]	[0.648]
D(DFLOW(-1))	0	-0.001	-0.021	0.314*
	[0.752]	[0.643]	[0.481]	[0.023]
D(DBI_RATE(-1))	-0.017*	-0.008	-0.354	-0.674
	[0.059]	[0.608]	[0.277]	[0.654]
D(DGDP(-1))	-0.028*	-0.046*	-0.064	0.354
	[0.034]	[0.029]	[0.891]	[0.870]
D(DRER(-1))	-0.005	-0.005	-0.019	0.36
	[0.118]	[0.286]	[0.864]	[0.483]
C	0.042	0.019	0.188	0.047
	[0.000]	[0.278]	[0.621]	[0.979]
Akaike AIC	-2.004	-1.084	5.119	8.184
Schwarz SC	-1.603	-0.682	5.521	8.585

Significant at the level * 5%

After analyzing the VECM models, we then conducted an analysis of Impulse Response Function (IRF). Impulse Response Function (IRF) is one step in a VECM analysis which aims to see the response of the dependent variable due to the shocks of the independent variables in a given period. The results of the analysis of Impulse Response Function Model + LDR reserve requirement policy instruments to mitigate the impact of capital flow to

movements in the credit cycle is shown in Figure 4. Overall macroprudential policy instruments such as reserve requirement + LDR and variable shocks BI Rate, GDP and the exchange rate is less responsive to the movement of the credit cycle in Indonesia. GWM + LDR_FLOWS policy response to changes in credit provide a response in the first period with a weak response to brake the impact of capital flows. Response macroprudential policy instruments GWM + LDR also has a weak response to the credit cycle. The response rate of the Central Bank in the form of central bank policy rate, capital flow GDP, and the exchange rate has a weak response to changes in credit in the first period.

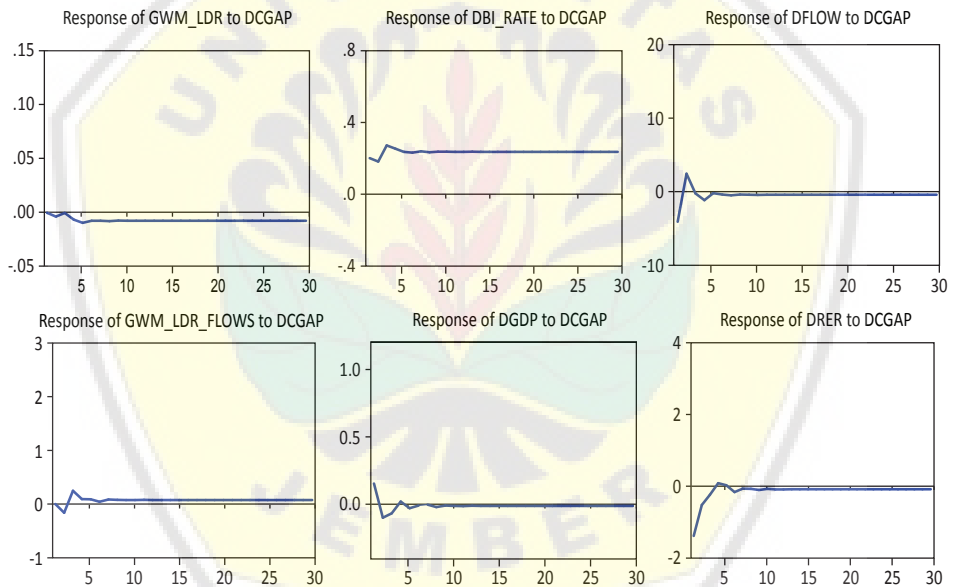


Figure 4. Impulse Response Function Model Statutory policy instrument + Loan to Deposit Ratio (GWM + LDR) to mitigate the impact of capital flow to movements in the credit cycle

After analyzing Impulse Response Function, the next step is to test the Variance Decomposition (VD). VD test is used to look at the contribution change form GWM_LDR_FLOWS macroprudential policy instruments and variable shocks BI rate, GDP and the exchange rate to changes in the credit cycle. VD test results on the model of the reserve requirement policy instruments to mitigate the impact of capital flow to movements in the credit

cycle is presented in Table 8. Variable macroprudential policy instruments such as GWM_LDR_FLOWS have the greatest contributed in mitigating the impact of capital flow to movements in the credit cycle with a value of 8568% in the period to 30, While other variables such as GWM_LDR policy, capital flows, the BI rate, GDP da exchange rate have a relatively small contribution to the change in the credit cycle in Indonesia.

Table 8. Results Variance Decomposition in Model (GWM + LDR) Policy to Mitigate Impact of Capital flows to Cycle Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	GWM_LDR	GWM_LDR_FLOWS	DFLOW	DBI_RATE	DGDP	DRER
1	0.081	100	0	0	0	0	0	0
5	0.144	86.309	0.128	7.566	1.364	1.641	1.957	1.031
10	0.193	86.016	0.13	8.07	1.255	1.977	1.795	0.754
20	0.265	85.754	0.134	8.437	1.257	2.137	1.675	0.602
30	0.322	85.662	0.136	8.568	1.258	2.194	1.631	0.547

4.4. Loan to Value (LTV) Policy: Business Cycles and Credit

VECM empirical test results provide a snapshot of how the effectiveness of macroprudential instruments such as LTV policy to mitigate the impact of capital flows to changes in the credit cycle. Table 9. Presenting the results estimated VECM model LTV policy instruments to mitigate the impact Cycle Business on the movement of the credit cycle. In the short term, VECM estimation results indicate that macroprudential policy instruments LTV not significant effect in reducing the impact of the business cycle to changes in private sector loans with a coefficient of 0.080. while, the BI rate and GDP significantly influence changes in the credit cycle with a coefficient of -0019 and -0028. VECM estimation test results on macroprudential instruments such as LTV can be said to the long-term balance. It is seen by the ECT (Error Correction Term) negative (-). The long-term analysis shows that the capital flow, the BI rate, GDP and the exchange rate significantly influence the credit cycle with value coefficient of 1.095, 1.253, 42 968, and -2077.

Table 9. Estimated Results VECM on macroprudential policy Model Loan to Value (LTV) to Mitigate Impact of Business Cycles to Credit

Long Term			
Variable	CointEq1	CointEq2	CointEq3
DFLOW(-1)	1.095	0.348	3.283
DBI_RATE(-1)	1.253	0.36	3.822
DGDP(-1)	42.968	15.616	119.911
DRER(-1)	-2.077	0.212	-0.42
C	-0.104	-0.755	-5.02
Short Term			
Variable	D(DCGAP)	D(LTV)	D(LTV_GDP)
CointEq ¹	-0.002	0.002	0.009
	[0.442]	[0.619]	[0.727]
CointEq ²	-0.007	-0.001	-0.009
	[0.663]	[0.968]	[0.952]
CointEq ³	0.002	-0.001	-0.002
	[0.492]	[0.881]	[0.928]
D(DCGAP(-1))	-0.381*	-0.116	-0.455
	[0.001]	[0.520]	[0.671]
D(LTV(-1))	-0.354	0.076	-1.303
	[0.346]	[0.899]	[0.718]
D(LTV_GDP(-1))	0.08	-0.014	0.221
	[0.215]	[0.892]	[0.718]
D(DFLOW(-1))	0	0	-0.001
	[0.599]	[0.958]	[0.915]
D(DBI_RATE(-1))	-0.019*	-0.012	-0.06
	[0.044]	[0.434]	[0.504]
D(DGDP(-1))	-0.028*	0.003	0.029
	[0.037]	[0.906]	[0.820]
D(DRER(-1))	-0.005	0.001	0.002
	[0.120]	[0.873]	[0.940]
C	0.039	0.02	0.118
	[0.000]	[0.252]	[0.263]
Akaike AIC	-1.979	-1.037	2.53
Schwarz SC	-1.611	-0.669	2.898

Significant at the level * 5%

After analyzing the VECM models, we then conducted an analysis of Impulse Response Function (IRF). The results of the analysis Impulse Response Function on the model LTV policy instruments to mitigate the impact of business cycles on the movement of the credit cycle is shown in Figure 5. Overall macroprudential policy instruments such as LTV and variable shocks BI Rate, GDP and the exchange rate is less a response to movements in the credit cycle Indonesia. LTV policy response occurred in the first period

subsequent move flat with a weak response. LTV policy response to cushion the impact of the business cycle responds to movements of the early period of the credit cycle next move flat to the positive direction. Response capital flow and BI rate response to changes in credit at the beginning of the period with positive and negative directions. While GDP and exchange rate response to credit occurred at the beginning of the period and the period of the 4th and then returned to find the point equilibrium.

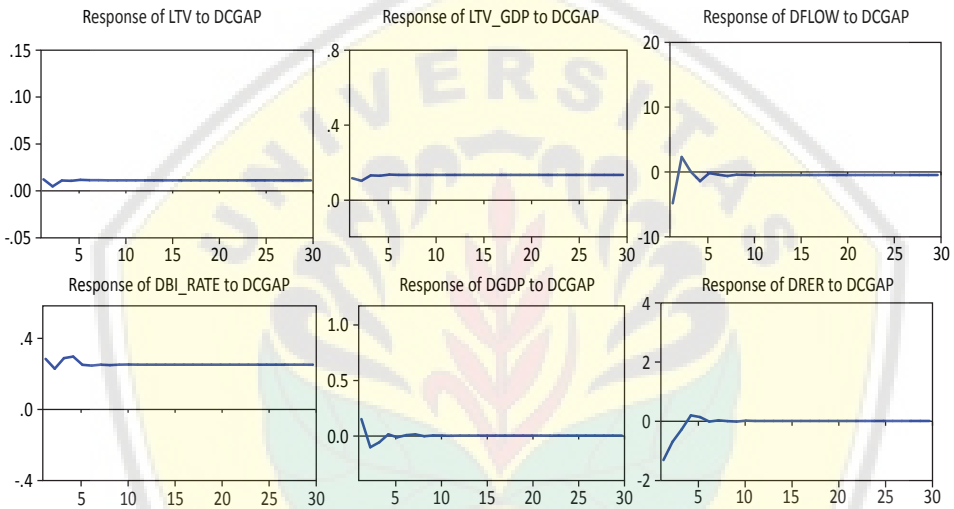


Figure 5. Impulse Response Function Model policy instrument Loan to Value (LTV) to mitigate the impact of business cycles on the movement of the credit cycle

Analysis Variance Decomposition provides descriptions contribution policy variable magnitude and variable LTV other surprises on the movement of the credit cycle. In the short term variations, credit movement is dominated by the surprise came from LTV policy to dampen the business cycle and the credit itself during the period of the 30th with a value of 3799 and 88 359. LTV policy also contributed to relatively large credit cycle is 2,517 in the period to 30th. While capital flows, the BI rate, GDP and the exchange rate contributed to the weak credit cycle.

Table 10. Results of Variance Decomposition in Policy Instrument Model Loan to Value (LTV) to Mitigate Impact of Cycles Business to Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	LTV	LTV_GDP	DFLOW	DBI_RATE	DGDP	DRER
1	0.083	100	0	0	0	0	0	0
5	0.149	89.159	2.335	3.241	1.066	1.424	1.531	1.24
10	0.201	88.795	2.423	3.511	1.035	1.715	1.257	1.26
20	0.277	88.473	2.492	3.723	1.068	1.868	1.091	1.281
30	0.336	88.359	2.517	3.799	1.08	1.922	1.031	1.289

4.5. Reserve Requirement (GWM) Policy: Business Cycles and Credit

Table 11 shows that the estimation of short-term use in mitigating the reserve requirement policy VECM business cycle no significant effect on credit with coefficient 0.006. While the credit cycle is affected by the variable itself with the coefficient value of -0381. On the other hand, the reserve requirement policy in dampening the business cycle is influenced by the variable itself with a coefficient of 0734. VECM estimation test results on macroprudential instruments such as reserve requirement can be said to the long-term balance. It is seen by the ECT (Error Correction Term) negative (-). The long-term analysis shows that the capital flows, the BI rate, GDP and the exchange rate significantly influence the credit cycle with value coefficient of -0809, -4713, 25 389, and -2388.

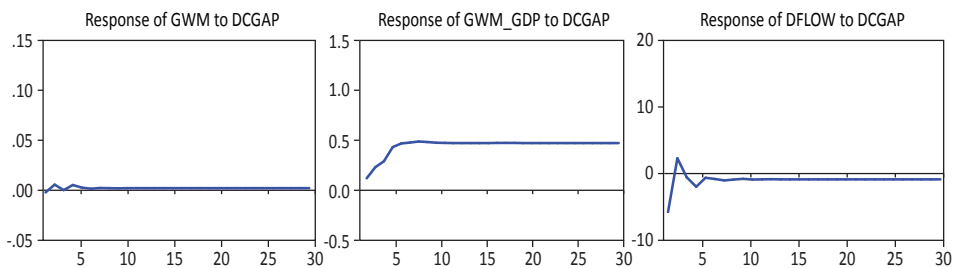
Table 11. Results In the VECM Estimation Model Statutory (GWM) to Mitigate Impact of Business Cycles to Credit

Long Term			
Variable	CointEq1	CointEq2	CointEq3
DFLOW(-1)	-0.809	0.068	3.791
DBI_RATE(-1)	-4.713	-9.9	-108.124
DGDP(-1)	25.389	51.302	569.223
DRER(-1)	-2.388	-7.11	-81.381
C	-0.017	-1.557	-14.026
Short Term			
Variable	D(DCGAP)	D(GWM)	D(GWM_GDP)
CointEq ¹	-0.004	0.004	-0.1
	[0.720]	[0.843]	[0.503]
CointEq ²	0.011	-0.023	0.228
	[0.800]	[0.731]	[0.674]
CointEq ³	-0.001	0.002	-0.016
	[0.818]	[0.716]	[0.705]

D(DCGAP(-1))	-0.381*	0.104	0.292
	[0.002]	[0.571]	[0.847]
D(GWM(-1))	-0.005	0.004	-5.802*
	[0.980]	[0.990]	[0.027]
D(GWM_GDP(-1))	0.006	0	0.734*
	[0.799]	[0.997]	[0.012]
D(DFLOW(-1))	0	-0.001	-0.016
	[0.686]	[0.439]	[0.172]
D(DBI_RATE(-1))	-0.017	0.003	0.016
	[0.102]	[0.827]	[0.900]
D(DGDP(-1))	-0.02	0.001	0.013
	[0.162]	[0.974]	[0.944]
D(DRER(-1))	-0.001	-0.002	0.009
	[0.649]	[0.633]	[0.813]
C	0.042*	0.012	0.099
	[0.000]	[0.489]	[0.497]
Akaike AIC	-1.909	-1.058	3.154
Schwarz SC	-1.541	-0.69	3.522

Significant at the level * 5%

Analysis of Impulse Response Function (IRF) movement of the credit cycle illustrates that GWM_GDP policy to cushion the impact of the business cycle responds to credit the to-period 5 to move in a positive way. While the reserve requirement policy response to a weak loan move until the period of the 30th. BI rate response to the credit cycle occurred in the first period with a positive move. The increase in the BI rate will be responded by the credit cycle in the first period. Meanwhile, the response of GDP and a negative exchange rate moves started early period until the period of the 30th. The increase in GDP and the exchange rate led to a decrease in the credit cycle. Lastly, response capital flow to movement of the credit cycle occurs at the beginning of the period until the 5th period and subsequently returned to the point equilibrium.



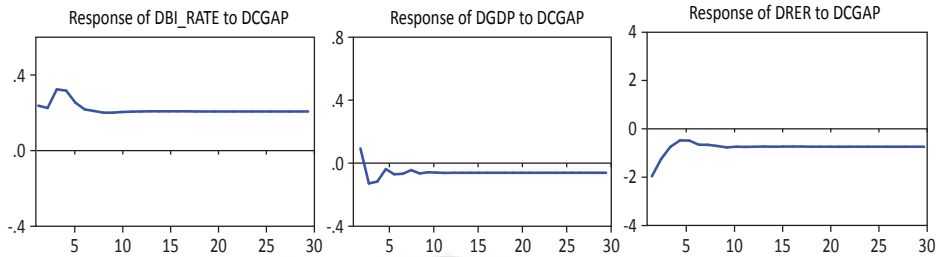


Figure 6. Impulse Response Function Model Statutory policy instrument (GWM) to mitigate the impact of business cycles on the movement of the credit cycle

Analysis Variance Decomposition describes the contribution of variable magnitude and variable reserve requirement policy more surprises on the movement of the credit cycle. In the short term variations credit movement dominated by the shock from the credit itself during the period of the 30th with a value of 97 041. While the reserve requirement policies contribute relatively low against the credit cycle that is equal to 0506 during the period of the 30th. While capital flows, the BI rate, GDP and the exchange rate contributed to the weak credit cycle.

Table 12. Results of Variance Decomposition in (GWM) Policy to Mitigate Impact of Business Cycles to Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	GWM	GWM_GDP	DFLOW	DBI_RATE	DGDP	DRER
1	0.086	100	0	0	0	0	0	0
5	0.158	96.222	0.698	0.719	0.229	0.078	0.578	1.472
10	0.216	96.665	0.58	0.699	0.132	0.113	0.554	1.252
20	0.3	96.944	0.526	0.663	0.075	0.124	0.526	1.139
30	0.366	97.041	0.506	0.65	0.055	0.128	0.516	1.099

4.6. GWM+LDR Policy: Business Cycles and Credit

VECM empirical test results provide the big picture significant macroprudential policy instruments such as GWM + LDR and variable other surprises to the credit cycle. Table 13 shows that the estimation of short-term use VECM GWM + LDR policy in mitigating the business cycle no significant effect on credit with coefficient 0.006. Credit cycle is affected by the variable itself with the coefficient value of -0.359. BI rate, GDP, and the exchange rate

significantly influence the movement of the credit cycle with each coefficient value of -0018, -0030, and -0006. While the GDP, on the other hand, a significant effect on the amount of the GWM + LDR policy with a coefficient value of -0046. VECM estimation test results on macroprudential instruments such as reserve requirement + LDR can be said to the long-term balance. It is seen by the ECT (Error Correction Term) negative (-). The long-term analysis shows that the capital flows, the BI rate, GDP and the exchange rate significantly influence the credit cycle with value coefficient of 1,278, 2,423, 17155, and -0362.

Table 13. Results In the VECM Estimation Model (GWM + LDR) to Mitigate Impact of Business Cycles to Credit

Long Term			
Variable	CointEq1	CointEq2	CointEq3
DFLOW(-1)	1.278	0.448	3.753
DBI_RATE(-1)	2.423	0.908	7.41
DGDP(-1)	17.155	2.649	19.026
DRER(-1)	0.362	1.261	8.914
C	0.253	-0.615	-4.169
Short Term			
Variable	D(DCGAP)	D(GWM_LDR)	D(GWM_LDR_GDP)
CointEq ¹	0.002	0.003	0.022
	[0.309]	[0.147]	[0.172]
CointEq ²	0.018	0.038	0.253
	[0.519]	[0.370]	[0.379]
CointEq ³	-0.002	-0.005	-0.034
	[0.543]	[0.352]	[0.367]
D(DCGAP(-1))	-0.359*	-0.055	-0.369
	[0.002]	[0.751]	[0.750]
D(GWM_LDR(-1))	-0.195	-0.011	-1.836
	[0.593]	[0.985]	[0.623]
D(GWM_LDR_GDP(-1))	0.027	-0.003	0.288
	[0.626]	[0.969]	[0.607]
D(DFLOW(-1))	0	-0.001	-0.005
	[0.651]	[0.652]	[0.569]
D(DBI_RATE(-1))	-0.018*	-0.007	-0.046
	[0.067]	[0.637]	[0.642]
D(DGDP(-1))	-0.030*	-0.046*	-0.296*
	[0.032]	[0.029]	[0.036]
D(DRER(-1))	-0.006*	-0.005	-0.036
	[0.080]	[0.307]	[0.273]
C	0.042*	0.019	0.116
	[0.000]	[0.276]	[0.310]
Akaike AIC	-1.945	-1.112	2.702
Schwarz SC	-1.577	-0.744	3.07

Significant at the level * 5%

Analysis of Impulse Response Function (IRF) movement of the credit cycle suggests that the policy GWM_LDR_GDP soften the impact of the business cycle responds to credit in the 3rd period with the movement of the weak. While the policy response to the credit GWM_LDR moving weak and flat until the period of the 30th. BI rate response to the credit cycle occurred in the first period towards the positive. Meanwhile, the response of GDP and a negative exchange rate moves started early period until the period of the 30th. Lastly, response capital flow to movement of the credit cycle occurs at the beginning of the period until the 5th period and subsequently returned to the point equilibrium.

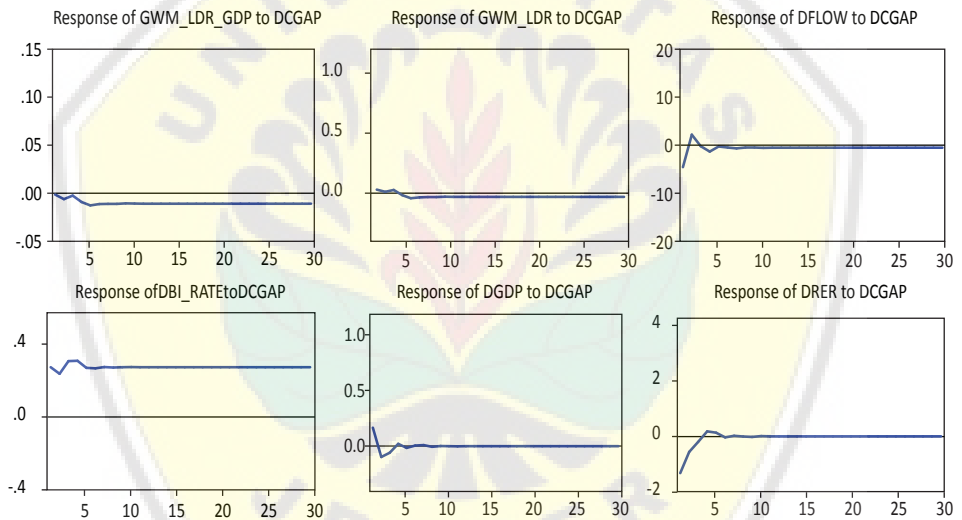


Figure 7. Impulse Response Function Model (GWM + LDR) to mitigate the impact of business cycles on the movement of the credit cycle

Analysis Variance Decomposition describes the contribution of variable magnitude GWM + LDR Policy and other surprises on the movement variable cycle credit. In the short term variations credit movement dominated by the shock from the credit itself during the period of the 30th with a value of 91 317. Capital flows, GDP and the exchange rate almost have the same contribution to the change in the credit cycle that is equal to 2,439, 2,122, and 2,174. While the reserve requirement policies contribute relatively low against the credit cycle that is equal to 0.001 in the period to 30th. Lastly, the BI rate has contributed as much as 1,892 in the period to 30th.

Table 14. Results of Variance Decomposition in Model (GWM + LDR) to Mitigate Impact of Business Cycles to Credit

Variance Decomposition CGAP								
Period	S.E.	DCGAP	GWM_LDR	GWM_LDR_GDP	DFLOW	DBI_RATE	DGDP	DRER
1	0.084	100	0	0	0	0	0	0
5	0.144	92.184	0.005	0.148	2.115	1.299	2.455	1.79
10	0.192	91.767	0.003	0.094	2.221	1.642	2.277	1.992
20	0.264	91.435	0.002	0.064	2.381	1.826	2.164	2.126
30	0.32	91.317	0.001	0.052	2.439	1.892	2.122	2.174

4.5. Discussion of Test Results Empirical VECM on Policy macroprudential, Capital flows, Credit and Business Cycle in Indonesia

Empirical test results using VECM consistent with research on the effectiveness of the macroprudential policy that has been done before. LTV policy geared to slow the rate of growth in motor vehicle loans and property. Corresponding empirical test results show that the increase in LTV is able to put the brakes on the rapid capital flows to the credit cycle. LTV policy can recommend as one of macroprudential policy instruments to mitigate systemic risks originating from credit risk. Increasing the amount of LTV will indirectly increase the amount of a number of buffers capital the banking system. Strengthening of banks' capital reserves would reduce systemic risk. Research conducted by Kim and Lee (2017) macroprudential policy instrument in the form of Foreign Exchange (FX) effective to mitigate the impact of capital inflow to growth excess of the credit cycle in Korea. While Lopez et al. (2014) conducted a study in Colombia with the results of empirical findings that macroprudential policy instruments such as countercyclical loan provisions are effective to mitigate the impact of procyclical capital inflow against credit growth. Countercyclical loan provisions are in addition to capital reserve banking which is used as a buffer in the event of non-performing loans (Akinci & Olmstead-Rumsey, 2015; Kara, 2016) The movement of the credit cycle tends to follow cycles of economic growth, as was done by (Apostoaie & Percic, 2014).

Later studies Mendicino & Punzi (2014) analyze the effectiveness of LTV policy in America. He found that the policy LTV able effectively to slow the rate of credit growth caused by capital flows. Then Gete & Reher (2016); Kong & Authority (2010) also support these findings. LTV policy directed to

reduce the rate of credit growth in terms of motor vehicle loans and property loans. LTV policy in Indonesia undergone some changes during this decade. The LTV policy change was tightened, especially on motor vehicle loans and property (Utari GA Diah, Arimurti sandpipers, 2012). Meanwhile, based on the findings of the empirical use method VECM analysis, statutory reserves policy is less effective to suppress the rush of capital flow to movements in the credit cycle. In addition to the reserve requirement policy is not effective to reduce the rate of credit growth directly. This condition is influenced by the behavior of the financial cycle behave procyclical towards economic phase.

VECM empirical findings indicate that the coefficient parameters GWM Policy + LDR negative in accordance with the hypothesis that the expected results. GWM + LDR effective policy to curb the impact of capital flows on the credit cycle. This is consistent with research conducted by Buncic & Melecky (2014); Montoro & Moreno (2011); Tovar et al., 2012) which found that the policy reserve requirement so-called by additional bank capital can effectively suppress excessive credit growth. Credit decline occurred because additional capital requirements that must be kept by the amount of the reserve requirement + LDR either in the form of currency and rupiah at Bank Indonesia. Besides the reduction in third party funds can be channeled back by banks in the form of loans because it is stored in the form of reserve requirement + LDR. On the other hand, the swift flow of capital inflow would trigger banks to increase lending. This is supported by research Baskaya, Giovanni, Kalemli-Özcan, Peydro, and Ulu (2017); Tarashev, Avdjiev, & Cohen (2016) indicates that the flow of heavy capital inflow will increase the loan portfolio. These empirical findings can be used as a reference by Bank Indonesia especially Division macroprudential policy as one of macroprudential policy instruments in order to control credit in Indonesia as a result of capital flows.

VECM model estimation on the other variables proved to be still in line with previous findings related to financial procyclical behavior, namely economic growth still significantly impact credit growth. Credit cycle, closely related to the phase of economic growth or movement of the business cycle. This is also supported by the findings of Apostoaie & Percic (2014); Du (2017); Okimoto & Takaoka (2017) which describes that the credit cycle tends to follow the movement of the movement pattern of the business cycle. This situation became one of the sources of systemic risk in credit growth that is

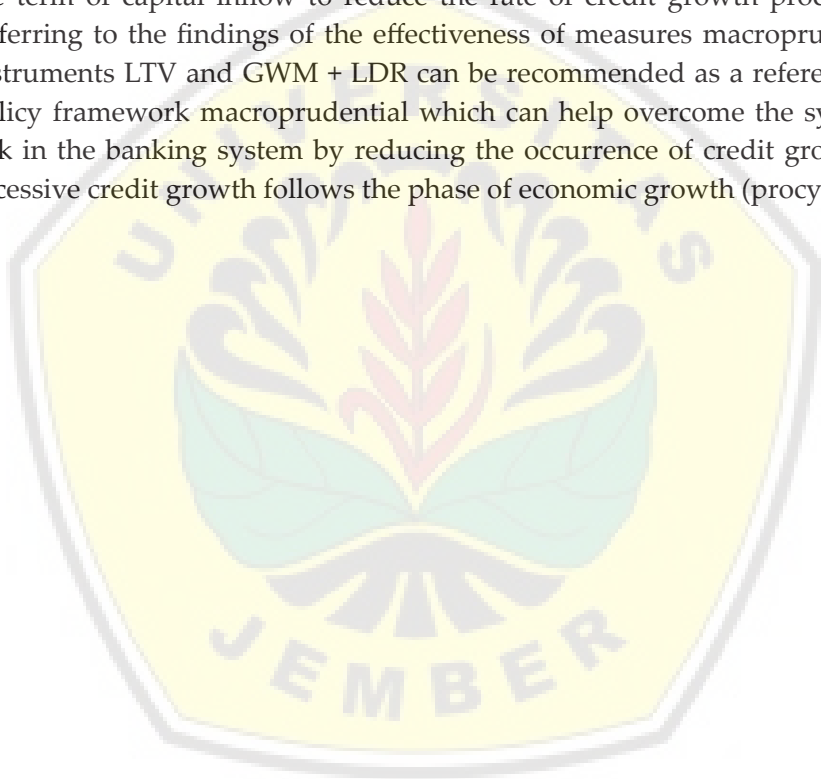
procyclical. The study also found that macroprudential policy instruments such as LTV, the reserve requirement, and reserve requirement + LDR are less effective to dampen business cycles on the movement of banking sector credit cycle. Macroprudential policy dampens business cycles tend to be difficult to dampen the excessive movement of the credit cycle. This is due to the behavior of banks towards lending, which tends to follow the pattern of economic growth. The behavior of bank lending nature procyclical would threaten the financial system on the occurrence of the systemic risk. In line with research conducted by Bahadir & Gumus (2016) found that less effective macroprudential policy instruments to dampen business cycles against credit excessive growth. Sebastian (2017); Bole, Prašnikar, and Trobec (2014) add behavior leading, which are procyclical influenced by the behavior of banking sector which avoids the risk of bad debts. On the other hand, excessive lending during the economic phase ride, it feared could threaten systemic risk of failure to pay when a customer when the turning point in the economic phase or it is called a recession

5. CONCLUSION

Credit cycle, capital flows, and macroprudential policy instruments is an interesting issue to be analyzed especially in contexts stability of the financial system. Swift currents flow capital could threaten credit portfolio growth, especially the private sector. Lending, which is procyclical has the potential for systemic risk to the banking system. Systemic risk arising from the linkages between financial institutions with one another (interconnected) and the tendency of the financial institutions follow the economic cycle (procyclical). Especially the need for an anticipation of macroprudential policies to prevent systemic risk primarily arising from the banking sector credit. This study aims to measure the effectiveness of policy instruments macroprudential to cushion the impact of capital flows and fluctuations in the business cycle of the credit cycle of the private sector by adding variable BI rate shocks, real GDP, and the real exchange rate. The analytical method used is the Vector Error Correction Model (VECM) to simulate the model in accordance with the mitigation and macroprudential policy instruments.

The results of the empirical findings provide results that macroprudential policy instruments such as LTV and GWM+LDR effectively address the impact

of capital flows on the rate of credit growth. While the reserve requirement policy instrument is not effective to suppress the movement of credit as a result of capital flow. Meanwhile, LTV macroprudential policy instruments, the reserve requirement, and reserve requirement + LDR is not effective to mitigate the impact of the business cycle of the credit growth. Based on the findings of this study, the policy recommendations that can be taken by Bank Indonesia is a liability hedging against the capital flow by extending the term of capital inflow to reduce the rate of credit growth procyclical. Referring to the findings of the effectiveness of measures macroprudential instruments LTV and GWM + LDR can be recommended as a reference for policy framework macroprudential which can help overcome the systemic risk in the banking system by reducing the occurrence of credit growth or excessive credit growth follows the phase of economic growth (procyclical).



REFERENCES

- Akinci, O., & Olmstead-rumsey, J. (2015). How Effective are Macroprudential Policies ? An Empirical Investigation. *Board of Governors of the Federal Reserve System*, (1136). <https://doi.org/dx.doi.org/10.17016/IFDP.2015.1136>
- Alegría, A., Alfaro, R., & Córdova, F. (2017). The impact of warnings published in a financial stability report on loan-to-value ratios. *BIS Working Papers No 633*, (633).
- Apostoaie, C.-M., & Percic, S. (2014). Credit Cycles and Business Cycles in Twenty EU Economies. *Procedia Economics and Finance*, 15(14), 1055–1064. [https://doi.org/10.1016/S2212-5671\(14\)00669-8](https://doi.org/10.1016/S2212-5671(14)00669-8)
- Arnold, B., Borio, C., Ellis, L., & Moshirian, F. (2012). Systemic risk, macroprudential policy frameworks, monitoring financial systems and the evolution of capital adequacy. *Journal of Banking and Finance*, 36(12), 3125–3132. <https://doi.org/10.1016/j.jbankfin.2012.07.023>
- Auer, R., & Ongena, S. (2016). The countercyclical capital buffer and the composition of bank lending. *BIS Working Papers No 593*, (593).
- Bahadir, B., & Gumus, I. (2016). *Credit decomposition and business cycles in emerging market economies*. *Journal of International Economics* (Vol. 103). Elsevier B.V. <https://doi.org/10.1016/j.jinteco.2016.10.003>
- Baskaya, Y. S., Giovanni, J., Kalemli-ozcan, S., Peydro, J., & Ulu, M. F. (2015). Capital flows, credit cycles and macroprudential. *BIS Papers*, (86), 63–68.
- Baskaya, Y. S., Giovanni, J. di, Kalemli-Özcan, Ş., Peydro, J.-L., & Ulu, M. F. (2017). Capital Flows and the International Credit Channel. *Journal of International Economics*. <https://doi.org/10.1016/j.jinteco.2016.12.003>
- Basten, C., & Koch, C. (2015). Higher Bank Capital Requirements and Mortgage Pricing: Evidence from the Counter-Cyclical Capital Buffer (CCB). *BIS Working Paper No. 511*, (511).
- Benes, J., & Kumhof, M. (2015). Risky bank lending and countercyclical capital buffers. *Journal of Economic Dynamics and Control*, 58, 58–80. <https://doi.org/10.1016/j.jedc.2015.06.005>

- Bianchi, J., Liu, C., & Mendoza, E. G. (2016). Fundamentals news, global liquidity and macroprudential policy. *Journal of International Economics*, 99, S2–S15. <https://doi.org/10.1016/j.jinteco.2015.12.006>
- Bole, V., Prašnikar, J., & Trobec, D. (2014). Policy measures in the deleveraging process: A macroprudential evaluation. *Journal of Policy Modeling*, 36(2), 410–432. <https://doi.org/10.1016/j.jpolmod.2014.01.007>
- Buncic, D., & Melecky, M. (2014). Equilibrium credit : The reference point for macroprudential supervisors q. *JOURNAL OF BANKING FINANCE*, 41, 135–154. <https://doi.org/10.1016/j.jbankfin.2014.01.005>
- Claessens, S., Ghosh, S. R., & Mihet, R. (2013). Macro-prudential policies to mitigate financial system vulnerabilities. *Journal of International Money and Finance*, 39, 153–185. <https://doi.org/10.1016/j.jimonfin.2013.06.023>
- Corrado, L., & Schuler, T. (2015). Interbank market failure and macroprudential policies. *Journal of Financial Stability*. <https://doi.org/10.1016/j.jfs.2016.10.007>
- Cronin, D., & McQuinn, K. (2016). Credit availability, macroprudential regulations and the house price-to-rent ratio. *Journal of Policy Modeling*, 38(5), 971–984. <https://doi.org/10.1016/j.jpolmod.2016.06.002>
- Drehmann, M., Borio, C., Gambacorta, L., Jiménez, G., & Trucharte, C. (2010). Countercyclical Capital Buffers: Exploring Options. *BIS Working Papers*, (317), 1–64.
- Drehmann, M., & Tsatsaronis, K. (2014). The Credit-to-GDP Gap and Countercyclical Capital Buffers: Questions and Answers. *BIS Quarterly Review*, (March), 55–73. Retrieved from <http://ideas.repec.org/a/bis/bisqtr/1403g.html>
- Du, D. (2017). U.S. credit-market sentiment and global business cycles. *Economics Letters*. <https://doi.org/10.1016/j.econlet.2017.05.039>
- Fendoğlu, S. (2015). Credit cycles and macroprudential policy framework in emerging countries 1. *BIS Papers*, (86), 17–25.
- Fendoğlu, S. (2017). Credit cycles and capital flows: Effectiveness of the macroprudential policy framework in emerging market economies. *Journal of Banking and Finance*, 79, 110–128. <https://doi.org/10.1016/j.jbankfin.2017.03.008>

- Galati, G., & Moessner, R. (2014). What do we know about the effects of macroprudential policy? *DNB Working Paper*, (440).
- Gambacorta, L., & Murcia, A. (2017). The impact of macroprudential policies and their interaction with monetary policy : an empirical analysis using credit registry data. *BIS Working Papers No 636 The*, (June), 1–43.
- Gete, P., & Reher, M. (2016). Two Extensive Margins of Credit and Loan-to-Value Policies. *Journal of Money, Credit and Banking*, Vol. 48, No. 7 (October 2016) C, 48(7).
- Ginting, R., Murniadi, C., Astiyah, G. W. S., Dewi, W. Y. H. K., Hartini, W. A. N. P., & Kholilah, T. (2013). Kodifikasi Peraturan Bank Indonesia Likuiditas Rupiah dan Valuta Asing Giro Wajib Minimum. *Pusat Riset Dan Edukasi Bank Sentral (PRES) Bank Indonesia*.
- Gomez-Gonzalez Jose Eduardo, Mauricio Villamizar-Villegas, Hector Manuel Zarate, Juan Sebastian Amador, C. G.-M. (2015). Credit and business cycles: Causal effects in the frequency domain. *Ensayos Sobre Política Económica*, 33(78), 176–189. <https://doi.org/10.1016/j.espe.2015.05.002>
- Gómez, E., Lizarazo, A., & Carlos, J. (2017). Evaluating the impact of macroprudential policies on credit growth in Colombia. *BIS Working Papers No 634*, (634).
- Kara, H. (2016). A brief assessment of Turkey's macroprudential policy approach: 2011–2015. *Central Bank Review*, 16(3), 85–92. <https://doi.org/10.1016/j.cbrev.2016.08.001>
- Karfakis, C. (2013). Credit and business cycles in Greece: Is there any relationship? *Economic Modelling*, 32(1), 23–29. <https://doi.org/10.1016/j.econmod.2013.01.036>
- Kiley, M. T., & Sim, J. (2015). Optimal Monetary and Macroprudential Policies: Gains and Pitfalls in a Model of Financial Intermediation. *Finance and Economics Discussion Series*, 2015(78), 1–56. <https://doi.org/10.17016/FEDS.2015.078>
- Kim, K., & Lee, J. Y. (2017). Estimating the effects of FX-related macroprudential policies in Korea. *International Review of Economics and Finance*, 50(January), 23–48. <https://doi.org/10.1016/j.iref.2017.03.030>

- Kong, H., & Authority, M. (2010). Loan-to-value ratio as a macroprudential tool – Hong Kong SAR ' s experience and cross-country evidence. *BIS Papers No 57 163*, (57), 163–178.
- Kuo, C. (2016). Does the vector error correction model perform better than others in forecasting stock price? An application of residual income valuation theory. *Economic Modelling*, 52, 772–789. <https://doi.org/10.1016/j.econmod.2015.10.016>
- Lopez, M., Tenjo, F., & Zarate, H. (2014). Credit cycles, credit risk and countercyclical loan provisions. *Ensayos Sobre Politica Economica*, 32(74), 9–17. [https://doi.org/10.1016/S0120-4483\(14\)70024-7](https://doi.org/10.1016/S0120-4483(14)70024-7)
- McCarthy, Y., & McQuinn, K. (2015). Credit conditions in a boom and bust property market: Insights for macro-prudential policy. *Quarterly Review of Economics and Finance*. <https://doi.org/10.1016/j.qref.2016.08.002>
- Mendicino, C., & Punzi, M. T. (2014). House prices, capital inflows and macroprudential policy. *Journal of Banking and Finance*, 49, 337–355. <https://doi.org/10.1016/j.jbankfin.2014.06.007>
- Montoro, C., & Moreno, R. (2011). The use of reserve requirements as a policy instrument in Latin America 1. *BIS Quarterly Review, March 2011 53*, (March).
- Oanea, D. (2015). The Journal of Economic Asymmetries Financial markets integration : A vector error-correction approach. *The Journal of Economic Asymmetries*, 12(2), 153–161. <https://doi.org/10.1016/j.jeca.2015.07.002>
- Okimoto, T., & Takaoka, S. (2017). Journal of The Japanese and International Economies The term structure of credit spreads and business cycle in Japan R. *Journal of The Japanese and International Economies*, 45, 27–36. <https://doi.org/10.1016/j.jjie.2017.06.001>
- Pramono, B., Hafidz, J., Maulana, J. A., Muhajir, H., Alim, M. S., Adamanti, J., ... Alim, S. (2015). Dampak Kebijakan Countercyclical Capital Buffer Terhadap Pertumbuhan Kredit Di Indonesia. *Working Paper. Bank Indonesia*.
- Purnawan, muhammad edhie, & m. abd. nasir. (2015). the Role of Macroprudential Policy To Manage Exchange Rate Volatility, Excess Banking Liquidity and Credits. *Moneter Dan Perbankan*, 18(1), 21–44.

- Rubio, M., & Carrasco-Gallego, J. A. (2014). Macroprudential and monetary policies: Implications for financial stability and welfare. *Journal of Banking and Finance*, 49, 326–336. <https://doi.org/10.1016/j.jbankfin.2014.02.012>
- Rubio, M., & Carrasco-Gallego, J. A. (2016). The new financial regulation in Basel III and monetary policy: A macroprudential approach. *Journal of Financial Stability*, 26, 294–305. <https://doi.org/10.1016/j.jfs.2016.07.012>
- Sebastian, R. (2017). Systematic Monetary Policy and the Macroeconomic Effects of Shifts in Loan-to-Value Ratios.
- Shi, S., Jou, J. B., & Tripe, D. (2014). Can interest rates really control house prices? Effectiveness and implications for macroprudential policy. *Journal of Banking and Finance*, 47(1), 15–28. <https://doi.org/10.1016/j.jbankfin.2014.06.012>
- Tarashev, B. N., Avdjiev, S., & Cohen, B. (2016). International capital flows and financial vulnerabilities in emerging market economies : analysis and data gaps. *Bank for International Settlements 2016.*, (August).
- Thierry, B., Jun, Z., & Doumbe, D. (2016). Causality Relationship between Bank Credit and Economic Growth : Evidence from a Time Series Analysis on a Vector Error Correction Model in Cameroon. *Procedia - Social and Behavioral Sciences*, 235(October), 664–671. <https://doi.org/10.1016/j.sbspro.2016.11.061>
- Tomuleasa, I.-I. (2015). Macroprudential Policy and Systemic Risk: An Overview. *Procedia Economics and Finance*, 20(15), 645–653. [https://doi.org/10.1016/S2212-5671\(15\)00119-7](https://doi.org/10.1016/S2212-5671(15)00119-7)
- Tovar, C. E., Garcia-escribano, M., & Martin, M. V. (2012). Credit Growth and the Effectiveness of Reserve Requirements and Other Macroprudential Instruments in Latin America. *IMF Working Paper 12/142*.
- Utari G.A Diah, Arimurti Trinil, K. I. N. (2012). Pertumbuhan Kredit Optimal dan Kebijakan Makroprudential untuk Pengendalian Kredit. *Working Paper. Bank Indonesia*, (June), 1–8.
- Zhang, L., & Zoli, E. (2016). Leaning against the wind: Macroprudential policy in Asia. *Journal of Asian Economics*, 42, 33–52. <https://doi.org/10.1016/j.asieco.2015.11.001>

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DISTINGUISHED SPEAKERS

Agus D.W. Martowardojo



Agus D.W. Martowardojo was born in the Netherlands in 1956. He is graduate of economics at the University of Indonesia and deepened his knowledge further through various programs at the State University of New York, Harvard Business School, Stanford University, and Wharton Executive Education. His career began in the banking industry at the Bank of America and then Bank Niaga in 1986. In 1995, he was appointed Managing Director of Bank Bumiputera and in 1988 as the Managing Director of Bank Ekspor Impor Indonesia. From 1999-2002, he served as the Managing Director of Bank Mandiri. In October 2002, after working as an advisor to the Chairman of IBRA (Indonesian Bank Restructuring Agency), he was installed as the Managing Director of Bank Permata. From May 2005 until May 2010 he led Bank Mandiri as its Managing Director. He won, among others, Indonesia's Best Executive in 2009 from Asia Money, The Indonesian Banker Leadership Achievement Award 2010 from The Asian Banker, and was chosen as Finance Minister of the Year 2012 on a global and Asia-Pacific level for The Banker in February 2012. Prior to his selection as the Governor of Bank Indonesia, he was the Minister of Finance of the Republic of Indonesia as of 20th May 2010. Subsequently, pursuant to Presidential Decree No 45/P of 2013, he was sworn in as the Governor of Bank Indonesia on 24th May 2013. In 2017, he has been awarded Central Bank Governor of The Year from East Asia by Global Markets, a newspaper which part of Euromoney Institutional Investor. His tenure as Governor of Bank Indonesia will run for the period from 2013-2018.

Perry Warjiyo



Dr Perry Warjiyo is currently installed as a Deputy Governor of Bank Indonesia. Dr Perry was previously the Assistant Governor of Monetary, Macropudential and International Policymaking at Bank Indonesia, a position he was entrusted to after serving as the Executive Director of Economic Research and Monetary Policy since 2009. Prior to his return to Bank Indonesia in July 2009, Dr Perry spent two years at the International Monetary Fund (IMF) as an Executive Director, representing 13 member countries under the auspices of the Southeast Asia Voting Group (SEAVG). Dr Perry has enjoyed a long and illustrious career at Bank Indonesia since 1984, particularly in the areas of economic research and monetary policy, international issues, organisational transformation and monetary policy strategy, central banking research and education, foreign exchange and external debt management, as well as head of the Office of the Governor. Dr Perry is also an active postgraduate lecturer at the University of Indonesia, specialising on International Monetary and Financial Economics as well as a guest lecturer at several universities in Indonesia. Dr Perry received his Master's and PhD degrees in International Monetary Economics and Finance from Iowa State University, US, in 1989 and 1991 respectively. In addition, Dr Perry has authored and published a number of book, journals and papers on economic, monetary and international issues.

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Andrew Sheng



Andrew Sheng is well known in global financial circles as a former central banker and financial regulator in Asia and a commentator on global finance. He is Distinguished Fellow of Asia Global Institute, the University of Hong Kong. Andrew is the Chief Adviser to the China Banking Regulatory Commission, a Board Member of Khazanah Nasional Berhad, the sovereign wealth fund of Malaysia, a member of the international advisory council of the China Investment Corporation, the China Development Bank, China Securities Regulatory Commission and the Securities and Exchange Board of India. He is also an advisor to the United Nations Environment Program Inquiry into the Design of a Sustainable Financial System. Andrew served as Chairman of the Securities and Futures Commission of Hong Kong from 1998 to 2005, having previously been a central banker with the Hong Kong Monetary Authority and Bank Negara Malaysia. He also worked with the World Bank from 1989 to 1993. From 2003 to 2005, he chaired the Technical Committee of the International Organisation of Securities Commissions (IOSCO).

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