BI INSTITUTE

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

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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 suistanable 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
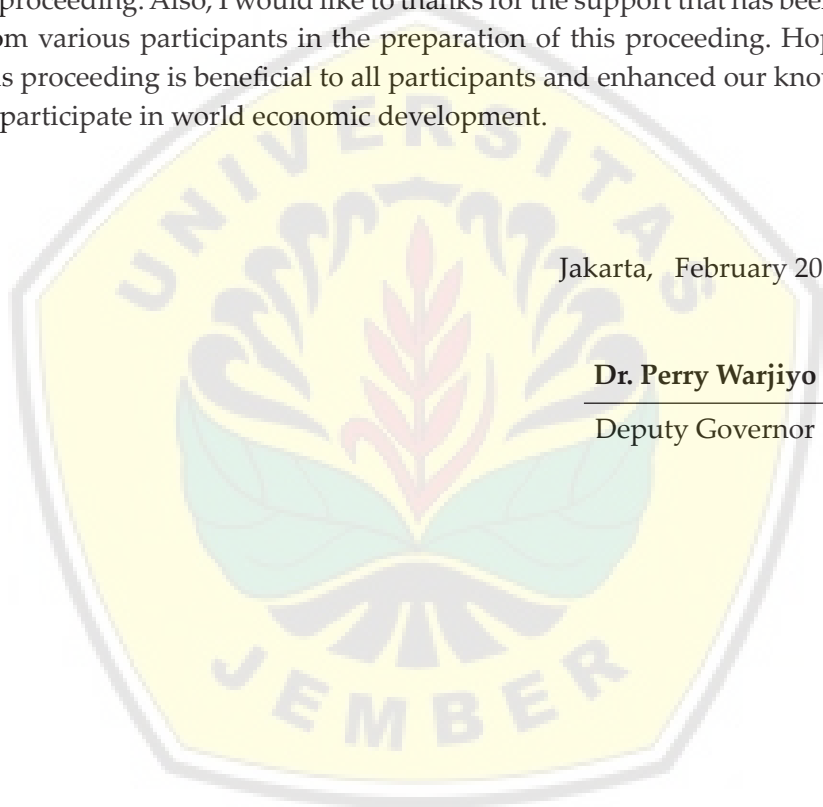
REPORT FROM COMMITTEE

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, Kyrgiztan, 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 Prasetiantono. 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 Prasetiantono.

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

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

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 E

Energy, Environment, and International Perspective of Sustainable Growth

TITLE :

The Impact of New Trade Agenda to Macroeconomic Performance of Indonesia and Japan in Short and Long Term
Amalia Adininggar Widyasanti - Ministry of National Development Planning (BAPPENAS)

The Effectiveness of the Macroprudential and Monetary Policies in Indonesia: Financial Stability and Price Stability Approach
Badara Shofi Dana, Adhitya Wardhono, M. Abd. Nasir, Ciplis Gema Qori'ah - University of Jember

Carbon Intensity Changes in the Asia Dragons. Lessons for Climate Policy Design
Miguel Rodrigueze - University of Vigo
Yolanda Pena-Bouqete - Italian National Council of Research (CNR)

Classifying Prediction Result of Energy Mineral Resources Refer to GDP and Population in Indonesia
Saadah S, Firmansyah H, Jondri - Telkom University

CHAIRPERSON :

Telisa Aulia F. Ph.D
University of Indonesia

The Effectiveness of The Macroprudential and Monetary Policies in Indonesia: Financial Stability and Price Stability Approach

Badara Shofi Dana[1], Adhitya Wardhono[2],
M. Abd. Nasir[3], Ciplis Gema Qori`ah[4]

University of Jember

ABSTRACT

Policy mix by Bank Indonesia to promote sustainable economic growth not only through monetary policy in stabilizing prices but also necessary for the stabilization of the financial system through the implementation of macroprudential policies in the financial system. The purpose of this study can contribute to the development of the conceptual framework of monetary and macroprudential policy mix as well as provide an alternative transmission is effective in achieving the main objective of Bank Indonesia. The data used in this study are monthly data in 2007M1 to 2016M9. The variables used were the nominal exchange rate, inflation, credit, real GDP, asset prices and Index Financial Stability (ISSK). Instruments used as macroprudential policy mix is monetary BI rate and GWM primary, GWM secondary, GWM Valas, GWM+LDR, LTV, and CCB. The analytical tool used in this research is Structural Vector Autoregression (SVAR) to see the influence of variables through the restriction as well as instruments that have an effective influence. Results showed that the

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interest rate of Bank Indonesia accompanied by GWM primary, GWM secondary, GWM Valas, GWM+LDR, LTV, and CCB influential in price stabilization through credit and economic growth. While the stabilization of the financial system, interest rate instruments, secondary statutory reserves and statutory reserves Currency effect through lines of credit, asset prices and exchange rates.

Key word: maroprudential policy, monetary policy, SVAR
JEL Classification: E58, E52, E44

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The Effectiveness of the Macroprudential and Monetary Policies in Indonesia: Financial Stability and Price Stability Approach

1. INTRODUCTION

After the global crisis in 2008/2009 gives a new perspective on policies other than monetary policy-related risks of the financial system. The reason, Bank Indonesia before the crisis has a task to stabilize prices and exchange rates. Implementation of monetary policy based on Inflation Targetting Framework (ITF) is not interpreted as a failure, precisely monetary policy based on inflation Targetting Framework (ITF) lower inflation at low levels, boost economic growth and a decline in interest rates in various countries (Warjiyo, 2016; Berg et al., 2013). But the procyclicality asset price bubble and credit boom led to the crisis that encourages economic activity declined dramatically (Warjiyo, 2016; Purnawan and Nasir, 2015; Claessens and Kose, 2013). The subject matter is focusing monetary policy on price stability underestimated the risk of a crisis that they are due to the financial system, as well as instrument of interest rates that are below inflation may increase the financial cycle and encourage systemic risk which in turn may result in instability in the financial system and the economy (Warjiyo, 2016). Thus the need for a monetary policy framework as well as the stability of the financial system through a mix of policy and operational procedures wider (Wimanda et al. 2014; Juhru, 2014). The global crisis has made a study of the need for new policies to address the risk of the financial system.

The implementation of the macroprudential policy framework for a solution to improve the resilience of the financial system and mitigating systemic risk (Purnawan and Nasir, 2015). Based on research conducted by Hamm et al., (2011) describes the macroprudential policy through the instruments of the Loan to Value (LTV), Loan to Deposit Ratio (LDR) and Statutory Reserves (GWM) is very effective to reduce the credit cycle. Meanwhile, research by Purnawan and Nasir (2015) shows the policy application One Month Holding Period (OMHP) and the Net Open Position (NOP) gives procyclicality on the volatility of the exchange rate, and statutory reserves + LDR effectively raising bank loans but did not happen procyclicality, while GWM primary lowering liquidity in the economy given the current incoming foreign capital flows are very heavy. In contrast, the results are shown by research conducted by Bustamante et al., (2012) which describes the policy Loan to Value (LTV) is not effectively implemented in the country of Colombia.

Based on the above presentation concluded the necessity of monetary and macroprudential policy mix to achieve the main objective of Bank Indonesia in stabilizing price and financial system stability. Monetary and macroprudential policy mix be the best and effective combination (Wimanda et al., 2012). The line on these things Purnawan and Nasir (2015) in his research stating the necessary monetary and macroprudential policy mix to cope with price stability and financial system stability. Therefore the aim of this study is to look at the effectiveness of monetary and macroprudential policy after the crisis in stabilizing prices and maintaining financial system stability in Indonesia. This study uses the methodology of Structural Vector Autoregression (SVAR) in view of the transmission of monetary policy and macroprudential policies in achieving the goals of Bank Indonesia.

2. THEORY

After the global crisis, the Central Bank not only has the function to maintain the stability of prices and the exchange rate, but also has a role in maintaining the stability of the financial system. (BIS, 2011; Warjiyo, 2016). The stability of the financial system with regard to the performance of a system that is able to withstand macroeconomic shocks, especially the risks arising from the financial system (Warjiyo, 2016). The condition is based on the historical causes of the financial crisis in general is caused by bubbles of assets (financial and housing), the credit boom and the accumulation of excessive debt and capital flows sudden stop (Reinhart and Rogoff, 2009; Claessens and Kose, 2013; Warjiyo, 2016) , Learning from the history of the central bank needs to be more flexible in responding to the instability of the world economy and to strengthen the monetary policy and the stability of the financial system (Wimanda et al.,2014). This is in line with the statement by the Bank for International Settlements (BIS), (2011) that the central bank involved in the formulation of financial stability policy. Thus the central bank is mandated decided to implement macroprudential policy.

Based on the dual mandate, the central bank to change the policy mix before the crisis after crisis is adding their macroprudential central bank in achieving its objectives.

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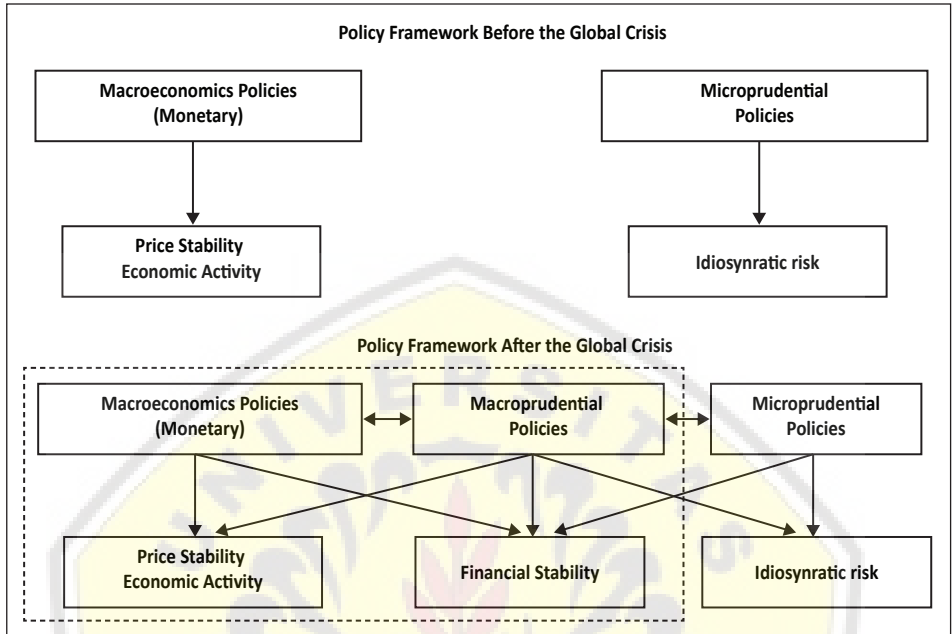
Source: International Monetary Fund,(2013). Processed

**Figure 1. The framework of monetary and macroprudential policy mix
before and after the financial crisis**

The main concepts of monetary and macroprudential policy mix to achieve the central bank's key objectives, namely price stability and supporting financial stability in overcoming financial system risks can be described as follows (Warjiyo, 2016).

1. Monetary policy is focused on achieving price stability by considering asset prices (finance and housing). This is because the asset price bubble will have an effect on the improvement of the economy that drives the crisis and economic recession

2. Macroprudential policy into regulation and supervision of financial institutions services in terms of macro and focus on systemic risk to achieve financial system stability. This is intended to reduce the procyclicality of the financial system and mitigate systemic risks originating from the financial institutions, markets, and infrastructure and payment systems.

Implementation of monetary and macroprudential policies in various countries adapted to the economic conditions of a country. Research conducted by Kim and Mehtora, (2016) describes the macroprudential and monetary policy coordination contribute to affect credit growth as well as cope with inflationary pressure. In line with the research is conducted, Greenwood-Nimmo & Tarassow, (2016) in his research explained that the implementation of monetary policy through interest rate instruments to mitigate the risk of the financial system in the absence of macroprudential policies mix. While the research conducted by Wimanda et al, (2014) described the monetary policy through the instrument of interest rates and macroprudential policy through the instrument of Statutory Reserves (GWM) primery, Statutory Reserves (GWM) secondary, Statutory Reserves (GWM) Valas, Statutory Reserves (GWM) + Loan Deposit Ratio (LDR) and the Loan to Value is effective in maintaining the stabilization of prices and the stabilization of the financial system. In the study conducted by Wright, et al. (2014) also confirms that the interaction between monetary policy and macroprudential policies to help reduce the impact of credit shocks affecting the national economy.

3. METHODOLOGY AND DATA

The data used in this study is a data time series monthly with 2007M1-2016M9 time period. Sources of data in this study obtained from Bank Indonesia, the International Monetary Fund (IMF), Bank Indonesia, Organization for Economic Co-operation and Development (OECD) and the CEIC. In addition, the variables used in this study is inflation, interest rate, the nominal exchange rate, economic growth, the number of credits, Statutory Reserves (GWM) primary, Statutory Reserves (GWM) Secondary, Statutory Reserves (GWM) Valas, Statutory Reserves (GWM) + Loan Deposit Ratio (LDR), Loan to Value (LTV) and Counter Cyclical Buffer (CCB) and there is a Financial System Stabilization Index (ISSK).

The effectiveness of monetary and macroprudential policy mix to achieve the Bank's main goal appears logical, this study divides in two models used to achieve price stability and financial system stability. The first model is used to look at monetary and macroprudential policy mix to stabilize prices. Meanwhile, the second model is a mix of monetary and

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macroprudential policy in stabilizing prices in fostering financial system stability. Thus the model specification used in this study is based on research conducted by Wimanda et al. (2014) as follows.

- Model price stability specifications

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 GWMPrimer_t + a_6 BIrate_t \tag{1}$$

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 GWMvalas_t + a_6 BIrate_t \tag{2}$$

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 GWMsekunder_t + a_6 BIrate_t \tag{3}$$

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 GWMLDR_t + a_6 BIrate_t \tag{4}$$

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 LTV_t + a_6 BIrate_t \tag{5}$$

$$Inf_t = a_0 + a_1 GDP_t + a_2 ap_t + a_3 ner + a_4 credit_t + a_5 CCB_t + a_6 BIrate_t \tag{6}$$

- Model specification of financial system stability

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 GWMPrimer + a_5 BIrate_t \tag{7}$$

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 GWMsekunder + a_5 BIrate_t \tag{8}$$

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 GWMvalas + a_5 BIrate_t \tag{9}$$

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 GWMLDR + a_5 BIrate_t \tag{10}$$

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 LTV + a_5 BIrate_t \tag{11}$$

$$ISSK_t = a_0 + a_1 ap_t + a_2 ner_t + a_3 credit + a_4 CCB + a_5 BIrate_t \tag{12}$$

Methodology Structural Vector Autoregression (SVAR) is developing a model of Vector Autoregression (VAR) built by Sims (1980).Model Structural Vector Autoregression (SVAR) have the variants on the relationship between variables that are restricted. Restrictions on the model SVAR aim to impose limits on the dynamics of interaction between variables appropriate based on

the prevailing theory (Sims, 1980). Based Kilinc and Tunc, (2014) SVAR model can be implemented to the decision-making of a policy based on the theory. In addition, SVAR concept can be used as proof of the economic theory of a shock (Bilmeiers and Bonator, 2002; Enders, 2003; Nezky, 2013). Thus SVAR approach can provide an overview of monetary and macroprudential policy mix to maintain price stability and promote the stability of the financial system.

SVAR models that use restriction on the relationship between the variables have the following basic models (Culha 2006; Kazanas et al.,2011).

$$Yt = \sum_{i=0}^{\infty} (A_i \, U_{t-i} = A(L)X_t) \tag{13}$$

where Ut is a vector of variables used in this study (BI rate, credit, nominal exchange rates, asset prices, GDP, inflation, ISSK, GWM primary,GWM secondary , GWM Currency, GWM + LDR, CCB, LTV) , While Ai is contemporaneous relations between variables and A (L) is finite-order polynomial matrix with lag operator L. Then enter a restriction on the model of equation (1) through (16) as follows.

- Restriction on the price stability equation model

$$
\begin{bmatrix} e_{BIrate} \\ e_{MP} \\ e_{credit} \\ e_{ner} \\ e_{ap} \\ e_{gdp} \\ e_{inf} \end{bmatrix}
=
\begin{bmatrix}
1 & 0 & 0 & & 0 & 0 & 0 & 0 \\
0 & 1 & 0 & & 0 & 0 & 0 & 0 \\
a_{31} & a_{32} & 1 & & 0 & 0 & 0 & 0 \\
a_{41} & 0 & 0 & 1 & 0 & 0 & 0 \\
a_{51} & 0 & 0 & a_{52} & 1 & 0 & 0 \\
a_{61} & a_{62} & a_{63} & a_{64} & a_{65} & 1 & 0 \\
a_{71} & 0 & 0 & a_{72} & a_{73} & a_{74} & 1
\end{bmatrix}
\begin{bmatrix} \varepsilon_{BIrate} \\ \varepsilon_{MP} \\ \varepsilon_{credit} \\ \varepsilon_{ner} \\ \varepsilon_{ap} \\ \varepsilon_{gdp} \\ \varepsilon_{inf} \end{bmatrix}
$$

- Restriction on financial system stability equation model

$$
\begin{bmatrix} e_{BIrate} \\ e_{MP} \\ e_{credit} \\ e_{ner} \\ e_{ap} \\ e_{issk} \end{bmatrix}
=
\begin{bmatrix}
1 & 0 & 0 & & 0 & 0 & 0 \\
0 & 1 & 0 & & 0 & 0 & 0 \\
a_{31} & a_{32} & 1 & & 0 & 0 & 0 \\
a_{41} & 0 & 0 & 1 & 0 & 0 \\
a_{51} & 0 & 0 & a_{52} & 1 & 0 \\
a_{61} & a_{61} & a_{62} & a_{63} & a_{64} & 1
\end{bmatrix}
\begin{bmatrix} \varepsilon_{BIrate} \\ \varepsilon_{MP} \\ \varepsilon_{credit} \\ \varepsilon_{ner} \\ \varepsilon_{ap} \\ \varepsilon_{issk} \end{bmatrix}
$$

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Variable MP is the sum of macroprudential Policies used in this study. Application of restriction in the model equations (1) through (16) can be as limiting the relationship between variables. Furthermore, it can do the Impulse Response Function (IRF) and Variance Decomposition (VD).

Table 1. Definitions, Units, Sources of Research Data

Endogen Variables	Definition-Unit-Source
INF	- Inflation proxied by Consumer Index Price (CPI) - Units of percent - Source = *International Monetary Fund*
GDP	- Economic growth proxied through Gross Domestic Product - Units of percent - Source = International Monetary Fund
AP	- Price of assets proxied throught Index Saham Gabungan (ISHG) - Units in index - Source = Organization for Economic Co-operation and Development (OECD)
NER	- The nominal exchange rate is the exchange rate used to exchange a country's currency with another country - Unit in the form of Rp / USD - Source = Bank Indonesia
credit	- The amount of credit disbursed by the bank - Unit USD - Source = CEIC
BI rate	- Indonesia's benchmark interest rate - Unit percent - Source = Bank Indonesia
GWM Primary	- Dummy Primary Statutory Reserves policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis
GWM Secondary	- Dummy Secondary Statutory Reserves policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis
GWM Valas	- Dummy Valas Statutory Reserves policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis
GWM+LDR	- Dummy Statutory Reserves+Loan Deposit Ratio policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis
LTV	- Dummy Loan To Value policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis
CCB	- Dummy Counter Cyclical Buffer policy - D = 0, the policy applied before the crisis - D = 0, the policy applied after the crisis

4. RESULTS AND ANALYSIS

4.1. Structural VAR Analysis Method Analysis

4.1.1. Monetary Policy Mix and Macroprudential and Price Stability

After the global crisis in 2008/2009 Bank Indonesia in achieving price stability is not only focused on monetary policy. However, there is a fair macroprudential policy which helped to stabilize prices through the instrument. This dual mandate of Bank Indonesia is a lesson learned from the global crisis in 2008/2009 that occurred due to systemic risk to the financial system that led to price volatility. Use of Structural VAR approach in this study aims to look at the effectiveness of monetary and macroprudential policy mix in maintaining price stabilization.

Table 2. SVAR Estimation Results on Primary GWM Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	GWM Primery	BI rate
Inflation	0.992*** [14.97] 0	0.479*** [3.914] 0	0.474** [2.435] -0.014	0.106 [0.598] -0.55	-	-	0.389 [0.449] -0.653
GDP	-	0.685*** [14.96] 0	0.098 [0.736] -0.461	0.433*** [3.696] 0	0.890*** [5.034] 0	0.388* [1.858] -0.063	0.616 [1.017] -0.309
Asset Price	-	-	0.482*** [14.96] 0	0.522*** [7.900] 0	-	-	0.456 [1.116] -0.264
NER	-	-	-	0.688*** [14.96] 0	-	-	0.842 [1.455] -0.145
Credit	-	-	-	-	0.366*** [14.96] 0	0.740*** [8.498] 0	0.905** [2.941] -0.003
GWM Primery	-	-	-	-	-	0.397*** [0.265] 0	
BI rate	-	-	-	-	-	-	0.112*** [14.96] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.

[…] = z-statistic, (…) = probability.

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The results of the analysis of monetary and macroprudential policy mix through the instrument of the interest rate of Bank Indonesia (BI) and Statutory Reserves (GWM) primery can be seen in Table 2. The instrument interest rate of Bank Indonesia (BI) and Statutory Reserves (GWM) primery effective in influencing price stability through lines of credit and economic growth. This condition means that when the determination of the Primary GWM and the interest rate of Bank Indonesia (BI rate) will be responded directly to credit and continued with the response by economic growth with the ultimate goal can affect inflation. Variable exchange rates can impact on inflation through asset price channel which gives effect to economic growth and continued to affect the inflation. Directly in asset prices and economic growth has significant impact on inflation.

Table 3. SVAR Estimation Results on Secondary GWM Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	GWM Secondary	BI rate
Inflation	0.583*** [14.966] 0	-0.853** [-2.139] -0.032	-0.016 [-1.148] -0.251	-0.0005* [-1.724] -0.08	-	-	-0.972** [-2.130] -0.033
GDP	-	0.133*** [14.967] 0	0.003 [1.166] -0.243	9.78 [1.360] -0.173	1.312** [2.150] -0.031	0.027** [2.029] -0.042	0.123 [1.187] -0.235
Asset Price	-	-	3.903*** [14.967] 0	0.011*** [6.180] 0	-	-	5.084* [1.694] -0.091
NER	-	-	-	203.59*** [14.967] 0	-	-	-72.241 [-0.462] -0.644
Credit	-	-	-	-	0.021*** [14.967] 0	0.041** [2.017] -0.043	0.005 [0.338] -0.734
GWM Secondary	-	-	-	-	-	0.096*** [14.967] 0	-
BI rate	-	-	-	-	-	-	0.123*** [14.967] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.

[...] = z-statistic, (...) = probability.

Table 3 is the result of the policy mix estimate of Statutory Reserves (GWM) secondary and interest rates in affecting price stability. The estimation results indicate Statutory Reserves (GWM) Secondary effective in influencing inflation through a line of credit which was forwarded to the ultimate goal of economic growth with inflation. The condition gives the sense that through a line of credit that affect the economic growth and economic growth have an impact on inflation can be effectively tracked secondary statutory reserves in achieving price stability. In addition, the secondary statutory reserves instrument can provide a direct influence on the economic growth in achieving the goal of price stability.

Different results are shown on the instrument the benchmark interest rate of Bank Indonesia (BI rate) that have an impact on inflation directly. Thus changes in the benchmark interest rate of Bank Indonesia provides a direct influence on changes in inflation without going through another variable transmission. Interest rates also have an impact on asset prices, but not to a trail in influencing the inflation caused by asset price has no effect on inflation. The direct relationship that can affect inflation only on a variable exchange rate and economic growth. Achievement of price stabilization in Indonesia needs to be done taking into account the dynamics of the exchange rate variable, economic growth, asset prices, interest rates and secondary statutory reserves , either directly or indirectly.

Estimation using analysis tools Structural VAR in valas statutory reserves policy mix and the benchmark interest rate of Bank Indonesia (BI rate) can be seen in Table 4. The estimation results indicate that the foreign exchange statutory reserves and interest rates are effective in stabilizing prices through different pathways. On the valas statutory reserves in achieving the objective of price stability through economic growth variables. While the interest rate has two lanes in stabilizing prices. The first path through credit variables that affect the economic growth and economic growth affect the inflation becomes an effective channel for the interest rate. The second track the interest rate directly through inflation. Thus the interest rate has two alternative paths to reach stabilization price.

Other analyses showed the results of the valas statutory reserves instruments and the interest rate has an influence on credit, but the credit can not be an alternative pathway to achieve stabilization of prices caused

by the credit has no effect on inflation. While the variable asset prices can impact on inflation, both directly and indirectly. Indirect relationships in the asset prices affect inflation through economic growth. inflation as a proxy variable of price stability is directly affected by the exchange rate, economic growth, asset prices and interest rates. Based on these results indicate price stability can be achieved if the Bank Indonesia to consider the movement of the exchange rate variable, economic growth, asset prices, interest rates and valas statutory reserves either directly or indirectly.

Table 4. SVAR Estimation Results on Valas GWM Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	GWM Valas	BI rate
Inflation	0.112*** [14.967] 0	0.5223*** [36.908] 0	0.826*** [63.861] 0	0.808*** [16.251] 0	-	-	0.547*** [11.333] 0
GDP	-	0.735*** [14.967] 0	0.411*** [5.423] 0	0.501 [1.554] -0.12	0.345 [1.498] -0.134	0.834* [1.651] -0.098	0.532 [1.625] -0.104
Asset Price	-	-	0.916*** [14.967] 0	0.321 [0.799] -0.424	-	-	0.828*** [2.159] -0.031
NER	-	-	-	0.216*** [14.967] 0	-	-	0.842*** [19.582] 0
Credit	-	-	-	-	0.301*** [14.967] 0	0.507*** [2.521] -0.012	0.396*** [6.612] 0
GWM Valas	-	-	-	-	-	0.141*** [14.967] 0	-
BI rate	-	-	-	-	-	-	0.474*** [14.967] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.

[...] = z-statistic, (...) = probability.

The achievement of price stability through the instrument GWM + LDR and interest rates can be seen in Table 5. The results show GWM + LDR instruments and the interest rate effective in achieving price stabilization with a path different alternatives. On the interest rate instrument, there are two alternative paths in stabilizing prices through credit and asset prices.

Credit variables that have an impact on economic growth further economic growth a significant effect on inflation can be effective lines in the interest rate affects inflation. Another alternative path in achieving price stability with interest rate instruments with variable asset prices. This is because asset prices have a significant effect on inflation. Another result of the interest rate has an influence on the exchange rate.

GWM + LDR instrument in achieving the main objective of Bank Indonesia, namely the stabilization of prices via two alternative paths. The first path through economic growth affects the inflation. The second pathway through significantly the relationship between credit and economic growth as well as economic growth and inflation. Both of these pathways may provide a major influence in stabilizing prices through the instrument of statutory reserves + LDR. Price stability can be achieved through monetary and macroprudential policy mix, either directly or indirectly

Table 5. SVAR Estimation Results on GWM+LDR Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	GWM LDR	BI rate
Inflation	0.329*** [14.967] 0	0.448*** [12.061] 0	0.405* [1.913] -0.056	0.131 [0.857] -0.391	-	-	0.446** [2.527] -0.011
GDP	-	0.660*** [14.967] 0	0.907** [2.162] -0.031	0.523* [1.719] -0.086	0.755*** [7.721] 0	0.886*** [6.439] 0	0.012 [0.036] -0.971
Asset Price	-	-	0.148 [14.966] 0	0.697*** [36.472] 0	-	-	0.744*** [20.336] 0
NER	-	-	-	0.735*** [14.967] 0	-	-	0.753*** [4.529] 0
Credit	-	-	-	-	0.637*** [14.967] 0	0.723*** [6.356] 0	0.611*** [4.234] 0
GWM LDR	-	-	-	-	-	0.529*** [14.967] 0	-
BI rate	-	-	-	-	-	-	0.417*** [14.967] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.

[...] = z-statistic, (...) = probability.

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Price stability through LTV policy mix with interest rates can be seen in Table 6. Instrument LTV in achieving price stability through two alternative paths. The first path through the relationship between credit and economic growth and economic growth with inflation. While the other lines can be through the relationship between economic growth and inflation. This is because the LTV has an influence on credit and economic growth.

On the interest rate instrument to give effect to stabilize prices through a line of credit that affect the economic growth and economic growth effect on inflation. In addition, the interest rate instrument can provide a direct influence on the economic growth in achieving price stability. Attainment of price stability can also be through changes in exchange rates, either directly or indirectly. Indirect relationship between the exchange rate with inflation through asset prices and economic growth. The results of the analysis of the policy mix LTV and interest rates in achieving price stability need to consider various aspects, both directly and indirectly. These aspects can be in the form of changes in exchange rates, asset prices and economic growth both directly and indirectly.

Table 6. SVAR Estimation Results on LTV Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	LTV	BI rate
Inflation	0.446***	0.805***	0.627***	0.424***			0.011
	[14.967]	[9.373]	[6.966]	[7.378]	-	-	[0.059]
	0	0	0	0			-0.953
GDP		0.089***	0.738***	0.216***	0.429***	0.031*	0.873***
	-	[14.967]	[57.425]	[19.804]	[50.328]	[1.912]	[22.736]
		0	0	0	0	-0.0559	0
Asset Price			0.660***	0.199**			0.436
	-	-	[14.967]	[2.556]	-	-	[1.585]
			0	-0.011			-0.112
NER				0.797***			0.022
	-	-	-	[14.967]	-	-	[0.066]
				0			-0.947
Credit					0.994***	0.966***	0.711*
	-	-	-	-	[14.967]	[6.024]	[1.714]
					0	0	-0.086
LTV						0.586***	
	-	-	-	-	-	[14.967]	-
						0	
BI rate							0.226***
	-	-	-	-	-	-	[14.967]
							0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

The use of a mix of instruments Counter Cyclical Buffer (CCB) and the interest rate to stabilize prices can be seen in Table 7. The CCB instrument in achieving the main objective of Bank Indonesia, namely the stabilization of prices through lines of credit and economic growth. These results obtained from there is a significant relationship between credit and economic growth as well as economic growth and inflation may become the path CCB effective in influencing the inflation. In addition, the CCB can achieve price stabilization through economic growth. In contrast the results with interest rate instruments that do not have a significant relationship in affecting inflation both directly and indirectly.

Another instrument that may affect the stabilization of prices is the exchange rate through asset prices and economic growth. These results are seen from a significant relationship between asset prices and economic growth and economic growth with inflation becomes effective exchange rate path. In addition, the achievement of price stability is directly through

Table 7. SVAR Estimation Results on CCB Policy Mix and Interest Rate

Variable	Inflation	GDP	Asset Price	NER	Credit	CCB	BI rate
Inflation	0.246*** [15.165] 0	0.291*** [6.668] 0	0.624*** [8.505] 0	0.326*** [4.409] 0	-	-	0.533 [0.160] -0.872
GDP	-	0.439*** [15.165] 0	0.465*** [3.713] 0	0.681*** [5.657] 0	0.289*** [3.891] 0	0.682*** [6.865] 0	0.215 [0.036] -0.971
Asset Price	-	-	0.326*** [15.166] 0	0.614*** [8.921] 0	-	-	0.925 [0.210] -0.833
NER	-	-	-	0.442*** [15.165] 0	-	-	0.999 [0.168] -0.866
Credit	-	-	-	-	0.551*** [15.165] 0	0.422*** [3.566] 0	0.731 [0.099] -0.921
CCB	-	-	-	-	-	0.028*** [15.165] 0	-
BI rate	-	-	-	-	-	-	0.006*** [15.165] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

economic growth, asset prices and exchange rates, while indirectly through credit, interest rate, and CCB.

Price stabilization through monetary and macroprudential policy mix according to research conducted by Kim and Mahtora, (2016) in his research in Asian countries exposes the contribution of monetary and macroprudential policies in addressing inflationary pressures via credit growth. In line with the research conducted by Wimanda et al (2014) also makes clear that a monetary and macroprudential policy can provide a boost in stabilizing prices in Indonesia. The conditions in accordance with the Bank Indonesia policy objectives stabilize prices not only seen from macroeconomic fundamentals but also to see the risk of the financial system.

4.1.2. Monetary Policy Mix and Macroprudential in Financial System Stability

This section explains the monetary and macroprudential policy mix on the stabilization of the financial system. This is because after the global crisis provides a new learning need for supervision of the financial system. The use of structural VAR analysis tools in this study can provide an effective path of monetary and macroprudential policy mix in achieving financial system stability with the restriction on relationships among variables.

The estimation results by using analysis structural VAR on the primary statutory reserves policy mix and interest rates can be seen in Table 8. Instruments in the effective interest rate affect the stability of the financial system through two channels, namely credit and asset prices. The first path through a significant relationship between credit with ISSK as a proxy for financial system stabilization can be an effective path of interest rates. The second track in the use of interest rate instruments in achieving the stability of the financial system through asset prices affects the stabilization of the financial system. Other results were obtained with the use of instruments is the interest rate can affect the dynamics of the exchange rate. In contrast the results with the use of primary statutory reserves policy instruments that have no relation to the stability of the financial system, either directly or indirectly. With these results, it can be seen that the stability of the financial system needs to consider variable asset prices, exchange rates, credit and interest rate, but not the primary statutory reserves instrument use.

Table 8. SVAR Estimation Results on Primary GWM Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	GWM Primery	BI rate
ISSK	0.661*** [14.967] 0	0.878*** [7.486] 0	0.144 [0.902] -0.366	0.750*** [11.334] 0	0.997 [0.579] -0.562	0.2 [1.287] -0.198
Asset Price	-	0.532*** [14.967] 0	0.153 [1.195] -0.232	-	-	0.559*** [5.002] 0
NER	-	-	0.391*** [14.967] 0	-	-	0.771*** [20.795] 0
Credit	-	-	-	-	0.37 [0.151] -0.88	0.447*** [5.003] 0
GWM Primery	-	-	-	-	0.0363*** [14.966] 0	-
BI rate	-	-	-	-	-	0.997*** [14.966] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[…] = z-statistic, (…) = probability.

Estimates on the secondary statutory reserves policy mix with interest rates can be seen in Table 9. The effectiveness of the secondary statutory reserves instrument and experience the difference in interest rates. At the secondary statutory reserves instrument in achieving the stability of the financial system through the credit variable. This is evident from the credit variables that affect ISSK. Different results with the use of instruments whose interest rate has no effect in stabilizing the financial system, either directly or indirectly. The achievement of stability of the financial system, either directly or indirectly, may just consider the GWM secondary and credit instruments. Another result obtained is the dynamics of the exchange rate can affect the price of an asset

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Table 9. SVAR Estimation Results on Secondary GWM Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	GWM Secondary	BI rate
ISSK	0.023***	-0.0007	7.26	0.186*	0.0225	-0.007
	[14.967]	[-0.312]	[0.557]	[1.685]	[0.948]	[-0.424]
	0	-0.755	-0.577	-0.091	-0.342	(0.6710
Asset Price		3.919***	0.012***			3.727
	-	[14.967]	[6.465]	-	-	[1.220]
		0	0			-0.222
NER			196.871***			-136.867
	-	-	[14.967]	-	-	[-0.895]
			0			-0.371
Credit					0.043**	0.011
	-	-	-	-	[2.169]	[0.720]
					-0.03	-0.471
GWM Secondary					0.093***	
	-	-	-	-	[14.967]	-
					0	
BI rate						0.122***
	-	-	-	-	-	[14.967]
						0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

Table 10 describes valas statutory reserves policy mix and interest rates in stabilizing the financial system. These results explain valas statutory reserves instruments and interest rates have different transmission paths in achieving the stabilization of the financial system. On the interest rate policy instrument in influencing the stabilization of the financial system through the exchange rate channel. While the valas statutory reserves instrument in influencing the stability of the financial system directly. Thus the stability of the financial system is directly affected by exchange rates and the valas statutory reserves with the indirect influence through interest rates. Other results showed the exchange rate may give effect to the asset price, but the price of the asset has no influence on the stabilization of the financial system.

Table 10. SVAR Estimation Results on Valas GWM Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	GWM Valas	BI rate
ISSK	0.649*** [14.966] 0	0.813 [0.312] (0.755)	0.673*** [4.839] 0	0.05 [0.497] -0.619	0.992*** [8.438] 0	0.055 [0.771] -0.943
Asset Price	-	0.023*** [14.966] 0	0.033*** [8.545] 0	-	-	0.289*** [42.624] 0
NER	-	-	0.566 [14.967] 0	-	-	0.973*** [7.220] 0
Credit	-	-	-	-	0.264** [2.474] -0.013	0.222 [1.539] -0.123
GWM Valas	-	-	-	-	0.535*** [14.966] 0	-
BI rate	-	-	-	-	-	0.397*** [14.967] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[…] = z-statistic, (…) = probability.

Instruments GWM+LDR and the interest rate in achieving stability of the financial system can be seen in Table 11. The significant relationship between credit and ISSK can be effective lines of Bank Indonesia in achieving the stability of the financial system through the instrument of interest rates. It is based on a significant relationship between the interest rate on credit. In addition, the interest rate has a direct relationship with ISSK. Another result obtained by using interest rate policy instruments can influence changes in exchange rates and asset prices. Unlike the statutory reserves + LDR policy instruments that do not have a significant relationship with ISSK.

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Table 11. SVAR Estimation Results on GWM+LDR Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	GWM LDR	BI rate
ISSK	0.970*** [14.967] 0	0.259 [1.115] -0.265	0.153 [0.680] -0.496	0.487*** [4.108] 0	0.208 [1.494] -0.889	0.537*** [3.148] -0.001
Asset Price	-	0.394*** [14.966] 0	0.718*** [11.744] 0	-	-	0.526*** [12.113] 0
NER	-	-	0.608*** [14.966] 0	-	-	0.126* [1.916] -0.055
Credit	-	-	-	-	0.571 [0.479] -0.631	0.433*** [5.162] 0
GWM LDR	-	-	-	-	0.061*** [14.967] 0	-
BI rate	-	-	-	-	-	0.870*** [14.9667] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

The different results on LTV policy mix and interest rates that have a weak effectiveness in stabilizing the financial system can be seen in Table 12. The use of instruments LTV does not have a significant relationship to the stability of the financial system, either directly or indirectly. While the interest rate instrument has a direct influence on ISSK. However, these results have a relationship with the credit variable ISSK directly. Another result obtained in exchange rates have a significant correlation effect on asset prices.

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Table 12. SVAR Estimation Results on LTV Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	CCB	BI rate
ISSK	0.679*** [15.099] 0	0.363 [0.292] (0.769)	0.076 [0.111] -0.911	0.647 [0.387] -0.698	0.921 [1.275] -0.202	0.675 [0.689] -0.491
Asset Price	-	0.051*** [15.996] 0	0.474 [17.787] 0	-	-	0.477*** [17.868] 0
NER	-	-	0.179*** [15.099] 0	-	-	0.554*** [7.104] 0
Credit	-	-	-	-	0.429*** [96.289] 0	0.415*** [25.162] 0
CCB	-	-	-	-	0.799*** [15.099] 0	-
BI rate	-	-	-	-	-	0.215*** [15.096] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

Table 13. SVAR Estimation Results on CCB Policy Mix and Interest Rate

Variable	ISSK	Asset Price	NER	Credit	CCB	BI rate
ISSK	0.679*** [15.099] 0	0.363 [0.292] (0.769)	0.076 [0.111] -0.911	0.647 [0.387] -0.698	0.921 [1.275] -0.202	0.675 [0.689] -0.491
Asset Price	-	0.051*** [15.996] 0	0.474 [17.787] 0	-	-	0.477*** [17.868] 0
NER	-	-	0.179*** [15.099] 0	-	-	0.554*** [7.104] 0
Credit	-	-	-	-	0.429*** [96.289] 0	0.415*** [25.162] 0
CCB	-	-	-	-	0.799*** [15.099] 0	-
BI rate	-	-	-	-	-	0.215*** [15.096] 0

* significant α=1%, ** significant α=5%, *** significant α=10%.
[...] = z-statistic, (...) = probability.

Instruments CCB policy and interest rates have effective results in the stabilization of the financial system. This condition has seen CCB instruments effective in influencing credit but on the stability of the financial system. As in interest rates affect the exchange rate and asset prices but does not affect the stability of the financial system. Conditions of monetary and macroprudential policy mix to stabilize the financial system remains relatively weak due to the stability of the financial system is much influenced by financial market conditions.

4.2. Discussion of Monetary and Macroprudential Policy Mix Result in Stabilizing Financial System Price and Stability

The effectiveness of monetary and macroprudential policy mix to stabilize prices and the stability of the financial system was a fundamental difference. This condition is caused by the challenges that are present in the economy in terms of both external and internal. Thus the Bank Indonesia policy that is accommodating and countercyclical to overcome these problems.

Table 14. Transmission of Monetary and Macroprudential Policy Mixes in Price Stability and Financial System Stability

Instrument	Transmision		The Main Purpose
	First Respon	Second Respon	
BI rate GMW Primer GWM Sekunder GWM+LDR LTV CCB	Credit	Economic Growth	Price Stability
GWM+LDR LTV	Economic Growth		
BI rate GWM Sekunder	Credit		Financial Stability System
BI rate	Asset Price		
GWM Valas	Exchange rate		

On the results of monetary and macroprudential policy mix to achieve price stability can through lines of credit and economic growth. Lines of credit that can influence the price stability through economic growth which can be utilized as an effective pathway by BI rate instruments, GWM Primary,

secondary statutory reserves , the statutory reserves + LDR, LTV, and CCB. Macroprudential and monetary policy mix in influencing price stability according to research conducted by Wimanda et al. (2014).

In Table 14 is a summary of the transmission of macroprudential and monetary policy in maintaining price stability and financial system stability in this study. The results showed an effective instrument in influencing price stability and financial system stability is the benchmark interest rate of Bank Indonesia (BI rate) and secondary statutory reserves. While an effective channel in transmitting the macroprudential and monetary policy in maintaining price stability and financial system stability in a row is a credit.

The mechanism of the use of instruments interest rate of Bank Indonesia (BI) in influencing the price stabilization through the transmission of monetary policy, where the policy-setting interest rate will affect the interest rates on deposits and loans as well as loans turn, will impact economic growth. Economic growth can affect the levels of inflation. Based on these descriptions can be explained transmission mechanism of monetary policy in maintaining price stability in Figure 2.
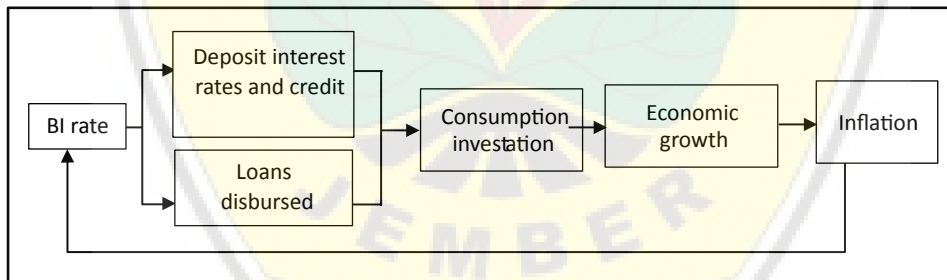
Source: Bank Indonesia, processed

Figure 2. The monetary policy transmission mechanism

Changes in the interest rate of Bank Indonesia adapted to the ongoing economic conditions. This is because when the economy is in a lethargic condition, Bank Indonesia lowered interest rates to encourage economic activity. The decline in interest rates will be followed by a decrease in loan interest rates boost loan demand both from businesses and households. This condition used to influence economic activity in keeping inflation.

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Implementation of macroprudential policy through instruments GWM Primary, secondary statutory reserves , the statutory reserves + LDR, LTV and CCB can give effect to inflation through credit and economic growth. Macroprudential instruments are used to mitigate the systemic risk that comes from excessive lending. This is because the crisis can be sourced from a credit boom that led to the economic decline (Warjiyo, 2016; Purnawan and Nasir, 2015; Claessens and Kose, 2013). The decline in the economy will result in the risk of price volatility.

Achievement of financial system stability through macroprudential and monetary policy mix does not provide effectiveness as the price channel. This condition is caused by the banking procyclicality that reduces credit expansion so as to encourage a deepening contraction in the financial cycle (Financial System Stability Indonesian, 2017). On the interest rate instrument and secondary statutory reserves in this study affect the stability of the financial system through the credit channel. While the achievement of financial system stability through the exchange rate channel by using the foreign exchange statutory reserves instrument. In addition, the asset price channel can also give effect to the stability of the financial system by using instruments interest rates.

5. CONCLUSION

The research looked macroprudential and monetary policy mix to stabilize prices and stabilization of the financial system by using analysis Structural VAR tools.The findings of this research with the instrument implementing Bi-rate, GWM Primary, GWM secondary, the secondary statutory reserves + LDR, LTV and CCB through lines of credit and economic growth to achieve price stability. While the achievement of financial system stability can be achieved with a line of credit, asset prices and exchange rates on the implementation of the BI rate instruments, GWM econdary, and GWM valas. Other findings in influencing asset prices, exchange rates, and economic growth can also be through monetary and macroprudential policy mix. Based on these findings explain the instruments of macroprudential and monetary policy mix can be used as an instrument in achieving the main objective of Bank Indonesia, but it also can be used to achieve other objectives such as maintaining exchange rate stability, asset prices, and economic growth.

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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 Warijiyo is currently installed as a Deputy Governor of Bank Indonesia. Dr Perry was previously the Assistant Governor of Monetary, Macroprudential 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.

Hal Hill

Hal Hill is the H.W. Arndt Professor of Southeast Asian Economies at the Australian National University. His general research interests are the economies of ASEAN, including country case studies and thematic, comparative work; industrialization and foreign investment in East Asia; regional (sub-national) development; and the political economy of development. He is the author

or editor of 18 books and has written about 150 academic papers and book chapters. He is an occasional op ed contributor to Australian and Asian newspapers and magazines, and a radio/TV commentator. He has worked as a consultant for the Australian Government, the Indonesian Government, the World Bank, the Asian Development Bank, and several United Nations agencies. He has held visiting appointments at Gadjah Mada University, the University of the Philippines, the Institute of Southeast Asian Studies, the University of Oxford, the International University of Japan, the Tinbergen Institute, Columbia University, University of Freiburg, and the National University of Malaysia. He serves on the editorial board of 13 academic journals.

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).

Muhammad Chatib Basri

Muhamad Chatib Basri, is a former Minister of Finance of Indonesia. Previously he was the Chairman of the Indonesian Investment Coordinating Board. Dr. Basri was also a Vice Chairman of the National Economic Committee of the President of Indonesia. He is a Thee Kian Wie Distinguished Visiting Professor at the Australian National University (2016-2017). His expertise is Interntional Trade, Macroeconomics and Political Economy. He was Ash Centre Senior Fellow at the Harvard Kennedy School, Harvard University (2015-2016), Pacific Leadership Fellow at the Centre on Global Transformation, University of California at San Diego (2016), NTUC Professor of International Economic Relation, RSIS, NTU, Singapore (2016). Dr Basri is also Chairman of the Advisory Board of the Mandiri Institute and Chairman of the Indonesia Infrastructure Finance. He teaches at the Departement of Economics University of Indonesia and Co-founded CReco Research Institute, a Jakarta based economic consulting firm in 2010. Dr Basri is a member of the World Bank Advisory Council on Gender and Development. He was a member of the Asia Pasific Regional Advisory Group of the International Monetary Fund (IMF) and a member of the High Level Trade Experts Group co-chaired by Jagdish Bhagwati and Peter Sutherland.

Ari Kuncoro

Ari Kuncoro is a Professor of the Department of Economics, in University of Indonesia and senior researcher in Institute of Economics and Social Research (LPEM FE UI) since 1994. Prior to that, currently he serves as the Dean of Faculty of Economics UI 2013-2017. Ari Kuncoro earned a Master of Arts degree from University of Minnesota in 1990 and completed his Ph.D in economics studies from Brown University in 1994. For academic excellence and outstanding service, he received several awards such as a gold medal for best paper from Global Network Development Network,

Heinz-Arndt Award from Australian National University, Best Researcher and Lecture from University of Indonesia. He has been well known in the area of knowledge economics development and government. He has published a number of papers in academic journal including American Review Journal and Bulletin Journal of Bank of Indonesia. His current research interest include urban economics, economics development, econometrics, and industrial organization.

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