



MACROPRUDENTIAL INSTRUMENT INTERDEPENDENCE ON STABILITY OF FINANCIAL SYSTEMS IN INDONESIA

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Abstract

Macprudential policy is a system-oriented policy, aimed at seeing the financial system as a whole through a top-down approach. With a top-down approach, the policies to be taken are based on the results of a comprehensive analysis of macroeconomic conditions and their impact on all risks in the financial system, including the correlation between systemic risk, market dynamics, and the choice of policies to be undertaken. This policy characteristic addresses the need for an aggregate approach in creating financial system stability. Thus macroprudential policy with top-down approach will complement microprudential policy which is focused on the bottom-up approach (through the bottom up) through deeper analysis of the risk of individual financial institutions. Macroprudential policy focus does not only cover financial institutions, but also includes other financial system elements, such as financial markets, corporations, households, and financial infrastructure. Because macroprudential policy is a policy with the ultimate goal of minimizing the occurrence of systemic risk. In some studies, ecosystem risk is defined as risk that can result in the loss of public trust and increased uncertainty in the financial system During this time to overcome the instability of the financial system, the government through the monetary authority uses monetary policy instruments to stimulate economic growth but it still causes a lot of debate. Among them is the debate that occurs with economists between using policy rules or discretion policies. In the rules-rules approach, the implementation of monetary policy refers to monetary policy based on the constant-money-growth rule. While the discretion approach refers to the monetary authority having freedom in carrying out monetary policy in accordance with the actual conditions faced by an economy (Natsir, 2008). Various studies have been carried out to prove the monetary policy instruments in influencing economic growth. In Indonesia, research conducted by Julaihah and Insukindro (2004) concluded that the money supply instrument cannot influence economic growth, while the SBI interest rate instrument is able to influence economic growth in the long run. Not only research in Indonesia

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1. INTRODUCTION

Macroeconomic stability is the main prerequisite for achieving financial system stability in supporting the achievement of a country's economic growth targets. The measure of economic progress in a country will always be seen from the economic growth that occurs in that country. No exception for developing countries such as Indonesia, economic growth will always be the center of attention. To be able to achieve high economic growth but remain stable is certainly not easy if it is not followed by the ability of macroeconomic variables in overcoming each problem. Like what Siregar, et al (2006) said that macroeconomic stability can be seen from the impact of the shock of a macroeconomic variable on another macroeconomic variable. If the impact of a shock causes large fluctuations in macroeconomic variables and requires a relatively long time to achieve long-term balance, then it can be said that macroeconomic stability is vulnerable to change. If on the contrary, the impact of shocks shows small fluctuations and the time to reach long-term equilibrium is relatively short then it can be said that macroeconomic conditions are relatively stable.



2. LITERATURE REVIEW

1. The Keynesian Theory

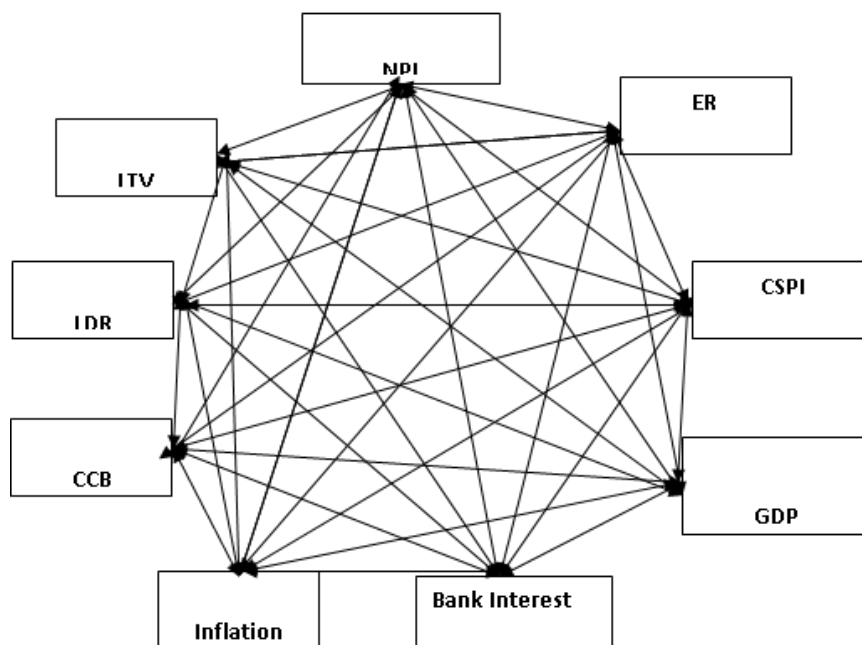
John Maynard Keynes was an economist in England and was the first to be able to explain in simple terms the cause of the Great Depression. So Keynes made an economic theory called the Keynesian Theory. This theory emphasizes the hypothesis of a cash flow cycle in which an increase in public spending (aggregate consumption level) in an economy will be able to encourage an increase in national income, thus the need for government policy intervention when the economy is sluggish so that national income targets can be achieved to prevent market failure (market failure).

In general, the Keynesian approach assumes that a country's foreign exchange reserves do not automatically reach its balance, but need intervention or policy from the government in the form of fiscal and monetary policies to regain its balance. According to Keynesian that to maintain the balance of foreign exchange reserves can be done through exchange rates between countries (exchange rates), interest rates, GDP and domestic credit, (Ackcay, et al., 2001 and Agbola, et al. 2004)

2. Mundell-Fleming Model Theory

Mundell-Fleming is the main model as a reference in determining policies in the open economic system, both monetary and fiscal policies. This model can be said to be almost the same as the IS-LM model, because both of them illustrate the interaction between the goods market and the money market. Because the two models are also based on the assumption that prices are fixed / fixed and show what causes short-run fluctuations in aggregate income. Well, the key difference is if the IS-LM model is used in a closed economy system while the Mundell-Fleming model is used in an open economy system. This model is made based on one important and extreme assumption that the economic system studied is small. open economy with perfect capital mobility. That is, the economy can borrow or lend as much as desired from the world money market. As a result, economic interest rates are determined by world interest rates. From these models it can be seen that the tendency / behavior of an economy depends on the exchange rate / currency rate adopted, whether floating or fixed exchange rate.

3. Conceptual Framework



3. RESEARCH METHODS

The research approach used in this study is a quantitative method. The data in this study are time series data from 1996 to 2017 by taking semester data which is secondary data in the form of publication of Bank Indonesia semester reports.

Scope and Definition of Operational Variables Data analysis uses Vector Auto Regretion. The scope of this research is focused on the VAR model. Data is collected in time series with a time span of 1996 to 2017.

$$LTV_t = \beta_{10} LTV_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} GDP_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$LDR_t = \beta_{10} LDR_{t-p} + \beta_{11} LTV_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} GDP_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$ER_t = \beta_{10} ER_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} LTV_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} GDP_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$KURS_t = \beta_{10} KURS_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} LTV + \beta_{14} CSPI_{t-p} + \beta_{15} GDP_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$CSPI_t = \beta_{10} CSPI_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} LTV_{t-p} + \beta_{15} GDP_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$GDP_t = \beta_{10} GDP_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} LTV_{t-p} + \beta_{16} INF_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$INF_t = \beta_{10} INF_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} LTV_{t-p} + \beta_{16} GDP_{t-p} + \beta_{17} NPL_{t-p} + e_{t1}$$

$$NPL_t = \beta_{10} NPL_{t-p} + \beta_{11} LDR_{t-p} + \beta_{12} ER_{t-p} + \beta_{13} KURS_{t-p} + \beta_{14} CSPI_{t-p} + \beta_{15} LTV_{t-p} + \beta_{16} GDP_{t-p} + \beta_{17} INF_{t-p} + e_{t1}$$

Where:

LTV = Loan To Value

LDR = GWM _Loan To Deposit Ratio

Interest = Interest (%)

GDP = Gross Domestic Product (Billion US \$)

CSPI = Consumer Price Index

Exchange = dollar exchange rate per rupiah

Inflation = Increase in price (%)

NPL = Non Performance Loan (%)

et = random disturbance

JP = lag length

4. RESULTS AND DISCUSSION

This study began with a stationary test of the variables used in the study, namely: Gross Domestic Product (GDP), LTV, LDR, interest rates, IHSG, exchange rates, NPLs and inflation. The results of the data stationarity test for all observed variables are as follows:



Table 1: Stationary Testing Results at Level

Variable	Value <i>Augmented Dickey Fuller</i>	McKinnon's Critical Value On Significance Level of 1%	Prob <0,05	Information
GDP	-1.582923	-3.886751	0.4692	Not Stasionary
LTV	-5.025607	-3.788030	0.0007	Stasionary
LDR	0.648323	-3.886751	0.9866	Not Stasionary
ER	-3.216445	-3.831511	0.0348	Not Stasionary
CSPI	-0.557596	-3.788030	0.8604	TidakStasioner
KURS	-4.012560	-3.788030	0.0061	Stasionary
NPL	-1.621402	-3.788030	0.4546	Not Stasionary
INF	-3.755823	-3.788030	0.0107	Stasionary

Table 2: Stationary Test Results on the 1st difference

Variable	Value <i>Augmented Dickey Fuller</i>	McKinnon's Critical Value On Significance Level of 1%	Prob <0,05	Information
GDP	-4.026201	-3.808546	0.0063	Stasionary
LTV	-5.025607	-3.788030	0.0007	Stasionary
LDR	-4.453389	-3.886751	0.0033	Stasionary
ER	-3.858551	-3.857386	0.0100	Stasionary
CSPI	-5.681102	-3.808546	0.0002	Stasionary
KURS	-4.012560	-3.788030	0.0061	Stasionary
NPL	-3.745864	-3.831511	0.0119	Stasionary
INF	-12.10152	-3.831511	0.0000	Stasionary

Table 3: Results of VAR Analysis

Variabel	The Bigges Contribution1	The Bigges Contribution2
GDP	KURS _{t-1} 0.488277	GDP _{t-1} 0.210125
LTV	CSPI _{t-1} 0.534541	ER _{t-1} 0.009946
LDR	CSPI _{t-1} 7.983621	KURS _{t-1} 4.483610
ER	GDP _{t-1} 6.776303	NPL _{t-1} 0.690433
CSPI	GDP _{t-1} 1.915462	CSPI _{t-1} 0.527027
KURS	KURS _{t-1} 0.723447	LTV _{t-1} 0.376213
NPL	KURS _{t-1} 1.076245	LTV _{t-1} 0.623195
INF	LTV _{t-1} 21.55005	GDP _{t-1} 0.677920



Discussion

The results of the conclusions of the contribution of the VAR analysis as in table 4. above shows the largest contribution of one and two to a variable, which is then analyzed as follows:

1. VAR analysis of GDP. The biggest contribution to GDP is the Exchange Rate, if the value of the Indonesian currency strengthens against the US Dollar it will have an impact on the price of goods which decreases so that purchasing power will increase and economic growth increases.
2. Var Analysis of LTV. The biggest contribution to LTV is JCI (Composite Stock Price Index) and Interest Rates, if the value of LTV increases it will cause the CPI value to decrease, this is because LTV (housing credit interest) increases so that people will not credit their homes and make investors of joint stock will suffer losses. The relation of LTV to interest rates is that if the interest rates are sacrificed to increase it will have an impact on the value of LTV which will also increase. Because the BI rate is the basis for the interest rates of other banks, the LTV rate can rise or down along with the rise or fall of the BI rate.
3. VAR analysis of LDR. The biggest contribution to the LDR is the IHSG (Composite Stock Price Index) and the Exchange Rate, if the LDR value increases, the CSPI will also increase because if banks increasingly channel funds to the public, many people will also buy shares. The relationship between the LDR and the exchange rate (exchange rate) if the rupiah exchange rate weakens against the dollar, the public will borrow money at the bank because the price of goods increases.
4. VAR Analysis of Interest Rates. The biggest contribution to interest rates is GDP and NPL, the relationship of interest rates to GDP is, if credit interest rates fall, people will borrow money in the bank so that people's purchasing power increases and economic growth increases. The interest rate relationship with the NPL is if the smooth lending rate is then a good NPL value.
5. VAR Analysis of IHSG (Merdeka Stock Price Index). The biggest contribution to the CSPI (Composite Stock Price Index) is GDP, because if more people invest in shares, employment will open, it will increase economic growth.
6. VAR Analysis of Chairs. The biggest contribution to Kur is the LTV, because if the exchange rate of the rupiah weakens against the US dollar, this will cause the value of the LTV to also decrease, this is caused by people not interested in crediting housing.
7. VAR analysis of NPLs. The biggest contribution to the NPL is the Exchange Rate and LTV, the relationship of the NPL to the exchange rate is that if the rupiah exchange rate weakens against the US dollar it will cause the public to reduce the sacrificed credit so that the NPL will also weaken. The relationship between NPL and LTV is that if the value of LTV increases, the value of NPL will also increase
8. VAR Analysis of Inflation. The biggest contribution to inflation is LTV and GDP, the correlation with inflation is that if inflation increases then NPL will decrease. Likewise with GDP, if inflation increases, GDP will also decrease.

9. CONCLUSION

1. This research has a good model, where the specifications of the model formed have stable results, which shows that all unit roots are in the circle of the Inverse Roots of AR Characteristic Polynomial image.
2. The results of the Vector Auto Regression Analysis using lag 1 basis indicate that there is a contribution from each variable to the variable itself and other variables. The results of the Vector Auto Regression analysis also show that past variables (t-p) contribute to the present variable both to the variable itself and other variables. From the estimation results it turns out there is a reciprocal relationship between one variable with another variable or in other words all variables namely GDP, LTV, LDR, Interest Rates, CSPI (Composite Stock Price Index), Exchange Rate and NPL with Inflation variables contribute to each other.
3. The results of the Impulse Response Function Analysis show the response of other variables to changes in one variable in the short, medium and long term, and it is known that the stability of the responses of all variables is formed in the 11th or medium term



- period and 22 or long term periods. The response of other variables to changes in one variable shows different variations from positive to negative or vice versa, and there are variables whose responses remain positive or remain negative from short to long term.
4. Variance Decomposition Analysis Results indicate that there are variables that have the greatest contribution to the variable itself both in the short, medium and long term such as GDP, LTV, Interest Rates and the Composite Stock Price Index (CSPI). While other variables that have the greatest influence on the variables themselves both in the short, medium and long term are GDP influenced the most by LTV, LTV is affected most by GDP, LDR is most affected by LDR and LTV, Interest Rates are most affected by Interest Rates, Index Composite Stock Price (CSPI) is influenced most by the Composite Stock Price Index (CSPI), Exchange rate is influenced most by Exchange and LTV, NPL is affected most by interest rates, while Inflation is affected most by LDR and LTV.
 5. Leading indicators in the short, medium and long term for macro prudential policies most recommended are LTV as leading for variables (GDP, LDR, Interest Rates, CSPI, Exchange Rate, NPL and Inflation).

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