Retesting The Volatility On The Trilemma Policy Of Macroeconomic Variables In Indonesia

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Abstract

The trilemma policy is a hypothesis stating a Mundell-Fleming macroeconomic development framework in which there is a state that cannot simultaneously choose three policies because it must sacrifice one policy so that the realization of policies that leads to economic stability is desired. The research aims to see the effect of the policy policy volatility on macroeconomic variables in Indonesia. The method used is the vector error correction model (VECM). The results show that the volatility of the trilemma policy adopted by Indonesia in the short and long term Affects the rate of economic growth and inflation. Economic shocks and uncertainties in the world economy externally affects macroeconomic variables. Viewing the results of forecasting for the trilemma policy and macroeconomic variables show that the inflation rate is so high and the level of economic openness is very low. This result recommends that there is a need for harmonization of policies undertaken by Bank Indonesia as the monetary authority and the government as a fiscal authority so as to achieve the level of financial stability that impacts on economic stability.

Keywords: *Trilemma Policy, Macroeconomics, Vector Error Correction Model (VECM), Forecasting*

1. INTRODUCTION

Since the era of globalization, financial crises have become more frequent than in the previous era. This arises because domestic financial disruptions in one country can result in a domino effect by disrupting other integrated economies leading to global financial chaos (Raz, 2012). The world financial crisis in 2008 provided experience in maintaining the stability of the world financial system and economy from the threat of financial turmoil and the spread of financial crises to various countries. Major changes during the financial crisis that resulted in the economic crisis led to a decline in the monetary regime and chose to use a combination of three trilemma policy objectives, namely monetary independence, exchange rate stability and economic openness which was reflected in prudent interest rates where this was stated by Mundell's in 1963 (Aizenman, 2012). The trilemma conception states that policymakers face *trade-off* in determining the three objectives. It is impossible for a country to simultaneously target these three goals. Policy makers in this case the central bank can only achieve two goals at the expense of one or two goals (Aizenman and Ito, 2014).

The trilemma policy is a hypothesis which states a Mundell-Fleming macroeconomic development framework in which it states that the state cannot simultaneously choose three policies because it has to sacrifice one policy so that policies that are more directed towards the desired economic stability are realized. In general, the changes that occur in each of these goals are contained in the context of the "trilemma" (Hsing, 2012). The research proposed by Aizenman, Chin and Ito (2008) developed a trilemma index that states the three levels of policy choices made by a country. The use of the trilemma index is because every concentration on two or three indices includes exchange rate stability, financial openness and monetary independence where the central bank has to sacrifice one of the three to achieve its stated goals (Aizenman, 2009).

Aizenman (2018) revealed that emerging market countries have implemented monetary policies that are integrated with prudent macroeconomic policies and have maintained the desired inflation rate. Indonesia is no exception, which has implemented trilemma policy actions since the 2008 world financial crisis. Looking further, the development of trilemma policies has made Indonesia stronger in overcoming the world financial crisis 2008. The trilemma index in Indonesia, which is the magnitude of the achievement of monetary policy which includes monetary independence, economic openness and a stable currency value (Yunita, 2017). The following is an explanation of the trilemma index in Indonesia:

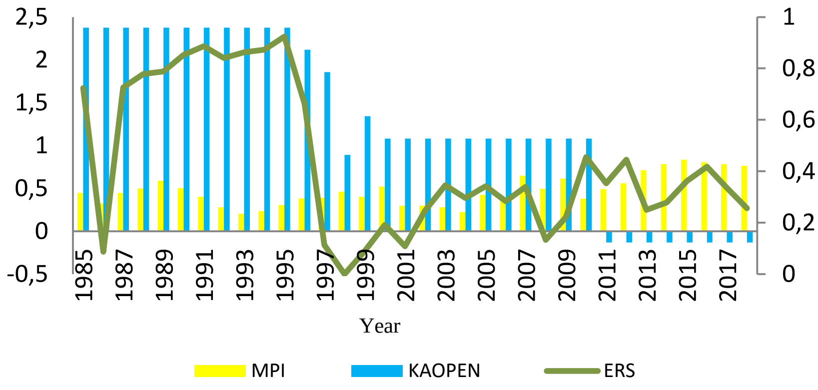

Figure 1: Development of trilemma policies in Indonesia in 1985-2018 (source: world bank, 2020, processed)

Bank Indonesia has the objective of achieving and maintaining the stability of the rupiah value. The stability of the rupiah value contains two aspects, namely the stability of the currency value against goods and services, and the stability of the currencies of other countries. The first aspect is reflected in the development of the inflation rate, while the second aspect is reflected in the development of the rupiah exchange rate against the currencies of other countries (Warjiyo, 2016). Based on these objectives of Bank Indonesia, this has resulted in a reduction in the amount of economic openness as reflected in the amount of *foreign direct investment* (FDI). The trilemma policies carried out by the central bank are contrary to the objectives of the government which stipulate economic openness through foreign investment or FDI to remain high so as to encourage higher economic growth (Yunita, 2017).

Economic growth and inflation which are based on a form of controlled inflation or the *inflation targeting framework* (ITF) makes it easy for the central bank to make trilemma policies (Cavoli and Rajan, 2013). The assessment of the inflation rate (ITF) and economic growth in Indonesia is carried out in various aspects, namely, consumption, investment, government spending and export-import. Economic growth that is supported by high oil exports has resulted in dependence on one source of state income (Deliarnov, 2006). This is what causes a country to experience a deadlock in managing existing resources. The implementation of the ITF is also a response to the turmoil of world economic uncertainty which has caused domestic shocks (Warjiyo, 2013). The Indonesian economy, which still tends to import a lot, causes an inflation rate due to a deficit in the balance of payments (Juhro, 2016).

In the midst of economic development which had an impact on economic growth after the 1997/1998 economic crisis, in 2008-2009 the world again experienced a very large economic crisis or financial crisis (Ali, 2018). The improvement in the world economy accompanied by uncertain policies led to a slight slowdown in economic growth and inflation in Indonesia following the 2008-2009 financial crisis.

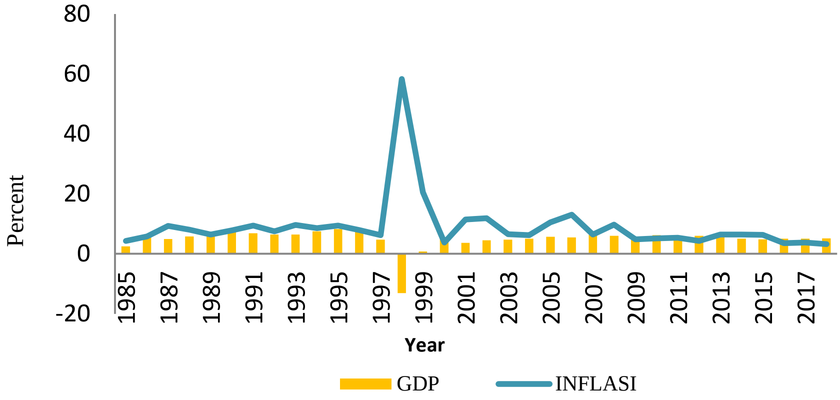

Figure 2 Economic Growth and Inflation in Indonesia in 1985 - 2018 (source: world bank, 2020, processed)

The economic growth and inflation rate that occurred in the period 2010 to 2018 cannot be separated from changes in the world economy, the composition of the domestic economy, domestic and foreign politics to the phenomenon of trade wars between countries, causing the Indonesian economy to remain in the range of 5.00% and the inflation rate which is prudent in the 3-4% range at the end of 2018. In formulating policies aimed at stabilizing the domestic economy, Bank Indonesia needs to look at the benchmark interest rate of the United States central bank or The Fed to determine the amount of domestic interest rates. Bank Indonesia is experiencing confusion and concern about the interest rate that will be set in the country which is useful to balance the interest rate of The Fed. This is what many economists refer to as the "*Taper Tantrum Dilemma*", namely a situation in which Bank Indonesia is confused about determining the magnitude of the benchmark interest rate due to the effect of announcing an increase in the benchmark interest rate of the Fed.

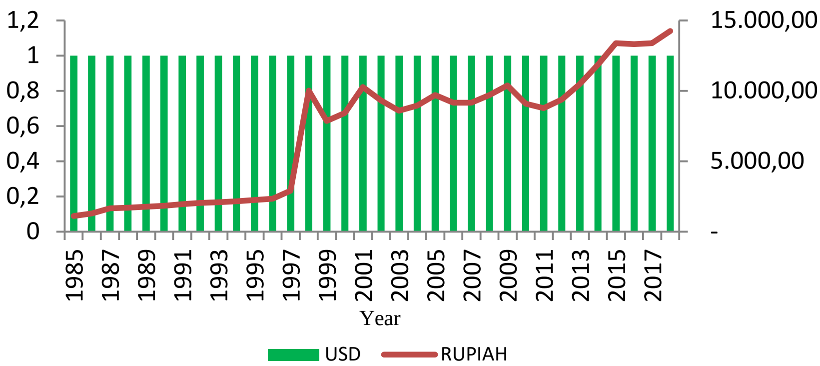

Figure 3 The Movement of the Rupiah Exchange Rate Against the Exchange Rate of the United States Dollar from 1985 to 2018 (source: world bank, 2020, processed)

Bank Indonesia, which is the central bank of Indonesia, has implemented the monetary policy set out in the policy trilemma. The trilemma policy requires Bank Indonesia to experience trade offs to determine the objectives to be taken and to sacrifice one policy in order to achieve the goal (Warjiyo, 2001). Changes in trilemma policy that not only impact macroeconomic variables, but also impact other monetary instruments, namely the stability of the Rupiah exchange rate and the Bank Indonesia benchmark interest rate. Such a strong influence was given when the tight monetary policy was implemented by Bank Indonesia, which was to provide a financial safety net in times of economic shocks (Warjiyo, 2003). This safeguard is by pressing or increasing the Bank Indonesia benchmark interest rate in response to economic shocks that will have an impact on national financial stability.

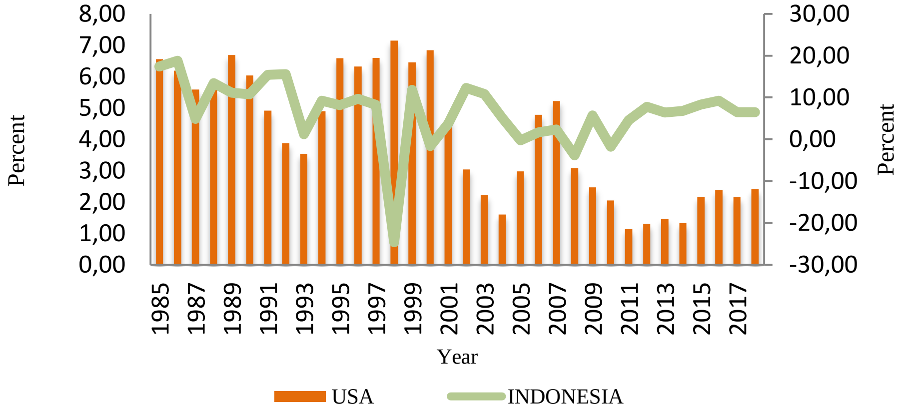

Figure 4 Movements of Bank Indonesia and The Fed Reference Interest Rates in 1985 to 2018 (source: world bank, 2020, processed)

The implementation of the inflation targeting framework or better known as the ITF by Bank Indonesia is a policy that is responsive to changes or announcements of the Fed's benchmark interest rate (Warjiyo, 2016). Changes in the Fed's benchmark interest rate encourage every country in the world to make changes with the aim of maintaining the availability of dollars and maintaining the investment climate.

2. METHOD

2.1 Types and Sources of Research Data

The type of data used in this research is secondary data. The form of data used is the time series, which starts from 1985 to 2018 with the object of research, namely Indonesia, whose data is taken annually. Retrieval of data sources used in this study, namely sourced from government agencies that have been published by the world bank.

2.2 Research Design

Research on the policy volatility trilemma or hypothesis trinity focuses on macroeconomic variables in Indonesia, namely economic growth (GDP) and inflation rate. The indication and justification of the influence is based on the form of quantitative research with a statistical descriptive approach and quantitative analysis.

2.3 Research Model Specifications

The research model used in this study refers to previous research in which the model was adjusted to identify the impact of visible trilemma policies based on the trilemma index on economic growth and inflation in Indonesia. The interaction of trilemma policies on macroeconomic variables can be seen in the model developed by Julian and Bogdan (2014), namely:

$$\mathbf{Y_t = a_0 + \beta_{1}.\ ERS_t + \beta_2.\ MPI_t + \beta_3.\ KAOPEN_t +} e_t \text{....... ....} \mathbf{(1.1)}$$

Where :

Yt	= variable macroeconomics that is economic growth and inflation,
ERSt	= exchange rate stability index,
MPIt	= index of monetary independence,
KAOPENt	= *capital mobility* index ,
a0	= *intercep*,
et	= *error term*

The above model is developed into the basic VAR model as follows:

$$\mathbf{Y_t = \beta_n \,.\, Y_{(n\text{-}t)} + \boldsymbol{e}_t} \text{..................} \mathbf{(1.2)}$$

The equation above is derived into the VECM model formulation to identify the trilemma phenomenon in macroeconomic variables as follows:

$$\Delta GDP_t = \alpha_{11} + ERS_{(t-1)} + \alpha_{12}\ KAOPEN_{(t-1)} + \alpha_{13}\ MPI_{(t-1)} + \alpha_{14}\ GDP_{(t-1)} + \alpha_{15}\ \Delta ERS_{(t-1)} + \alpha_{15}\ \Delta KAOPEN_{(t-1)} + \alpha_{16}\ \Delta MPI_{(t-1)} + \alpha_{17}\ \Delta GDP_{(t-1)} + \alpha_{18}\ \Delta SNT_{(t-n)} + \alpha_{19}\ \Delta KAOPEN_{(t-n)} + \alpha_{20}\ \Delta MPI_{(t-n)} + \alpha_{21}\ \Delta GDP_{(t-n)} + e_t \text{..................} (1.3)$$

$$\Delta INF_t = \alpha_{22} + ERS_{(t-1)} + \alpha_{23}\ KAOPEN_{(t-1)} + \alpha_{24}\ MPI_{(t-1)} + \alpha_{25}\ INF_{(t-1)} + \alpha_{26}\ \Delta ERS_{(t-1)} + \alpha_{27}\ \Delta KAOPEN_{(t-1)} + \alpha_{28}\ \Delta MPI_{(t-1)} + \alpha_{29}\ \Delta INF_{(t-1)} + \alpha_{30}\ \Delta ERS_{(t-n)} + \alpha_{31}\ \Delta KAOPEN_{(t-n)} + \alpha_{32}\ \Delta MPI_{(t-n)} + \alpha_{33}\ \Delta INF_{(t-n)} + e_t \text{..................} (1.4)$$

2.4 Data Analysis Methods

The quantitative approach is an approach that is carried out by recording and analyzing data from the exact research results using statistical calculations (Sudjana, 2004) and the *Vector Error Correction Model* (VECM) is an analysis used to estimate data that is not stationary at the level level, but has a relationship. cointegration (Widarjono, 2005). In the VECM model, it can see the short and long term relationships provided by the independent variable on the dependent variable.

3. RESULTS AND DISCUSSION

3.1 Economic Growth Rate and Inflation Rate Affected by Trilemma Policy

Based on the results of estimates carried out with the *economic growth model* (GDP) and the *inflation model* against the trilemma variables, namely exchange rate stability (ERS), monetary independence (MPI) and economic openness (KAOPEN) with the *Vector Error Correction Model* (VECM) analysis tool, it is indicated that GDP level and inflation in Indonesia in the short term are influenced by the policy trilemma. This is shown in one of the results of the economic growth model and the inflation model which is influenced by one of the three trilemma policies implemented by Bank Indonesia as the central bank. The estimation results are in accordance with the "*Trilemma Mundellian*" theory which shows that there is a *trade-off* in choosing the policy objectives of the central bank by encouraging a reduction in priorities for other policies (Aizenman, 2018). The application of the exchange rate regime and the policy mechanism of the inflating targeting framework (ITF) in Indonesia to central bank policies in the context of "*Trilemma*".

The long-term influence exerted by the trilemma policy is only represented by monetary independence and economic openness to the rate of economic growth and inflation in Indonesia. Where in the long run the rate of economic growth has a positive influence on monetary independence and is negatively affected by economic openness. At the inflation rate, monetary independence has a not too significant effect on the inflation rate. For economic openness, it has a significant level of influence on the inflation rate but is negative.

The Mundell-Fleming model explains that the monetary policy mechanism has less effective impact on the exchange rate regime system that is managed when capital is free to move. In this case, the benchmark interest rate parity needs to balance the central bank reference rate of the Fed to attract international reserves and capital mobility into the country (Aizenman and Ito, 2008). The policy that needs to be developed is about a more progressive fiscal policy mix mechanism because it is to reduce the dependence of the central bank in using monetary independence policies (Aizenman, 2018).

3.2 Discussion of Data Processing Results on *Trilemma Policy* on Economic Growth and Inflation Variables in Indonesia Based on Estimation of *Vector Error Correction Model* (VECM) Analysis

Looking at the estimation results of the *Vector Error Correction Model* (VECM) analysis that there is a significant and insignificant short-term relationship at each lag. Where the economic growth variable in the first lag shows that in the previous period it had a significant and positive influence on one of the trilemma policy variables, namely monetary independence (MPI) which is in accordance with research conducted by Aizanman on emerging market countries in Asia in 2011 Ihnatov and Capraru (2014) conducted a study on Central European and Eastern European countries showing that the trilemma policies carried out by the central bank have a significant effect on economic openness (KAOPEN) which is positive, this is in accordance with the results of research in Indonesia which shows an influence The positive effect given by the trilemma policy on economic growth in the next lag and however there is a negative effect which shows that the trilemma policy of the central bank does not always have a positive impact on economic growth. For the trilemma variable, namely exchange rate stability (ERS), it has an insignificant and negative effect on economic growth, this is also in accordance with research conducted by Warjiyo and Juhro (2016) that exchange rate stability (ERS) is the goal of Bank Indonesia. has had a negative impact as it further protects the Rupiah exchange rate, which in turn reflects domestic financial stability.

Seeing the approach taken by Mundell-Fleming and the Dornbusch's Overshooting model, monetary policy is more focused on fundamental factors in determining the exchange rate and how far the effectiveness of monetary and fiscal policy is in stabilizing output (Warjiyo and Juhro, 2016). The analytical framework used to identify the relationship to the trilemma policies used in the open economic system. This is in conflict with *Tinbergen's* formulation for a closed economy, that there is only one monetary policy instrument for one purpose, so that in an open economy it focuses more on a policy that is determined based on the consideration of the exchange rate and foreign exchange system applied (Warjiyo et al. Juhro, 2016). In other words, the effectiveness of monetary policy in influencing output only applies if a country in question adopts a flexible exchange rate system (*managing floting exchange rate*) and a free foreign exchange system (Warjiyo and Juhro, 2019).

Looking at the results of the analysis using the VECM, there is a significant and insignificant short-term relationship at each lag. These results also agree with the research conducted by Warjiyo (2013) that the application of the floting exchange rate system has an impact on unfavorable inflation because the central bank cannot intervene in the market in controlling the exchange rate. In the next lag, the inflation variable is influenced by differential economic openness (KAOPEN), that there is a significant effect that is positive or negative and the insignificant effect is positive and negative. This is also in accordance with the results of research conducted by Yunita (2017) where the inflation variable experiences quite high volatility because it is influenced by one of the trilemma policies of the Indonesian central bank which implements a managing free floating exchange rate regime in Indonesia against central bank policies in context "trilemma" (Aizenman, 2018). Regarding this, the concept of the trilemma policy collides with the central bank's policy in controlling the predetermined inflation rate or the *inflating targeting framework* (ITF) (Warjiyo, 2013). The ITF policy which has many meanings and implications is contained in the diffusion mechanism of the monetary fundamentals being implemented (Warjiyo and Juhro, 2019). Where monetary policy must achieve conformity as stated in the ITF which is announced to the public in the form of law and harmonized with progressive fiscal policy.

3.3 The Impact of Trilemma Policy on Economic Growth and Inflation

The trilemma policy that has an impact on the rate of economic growth and the rate of inflation can be seen in how long the effects of the trilemma policy affect economic growth and inflation in Indonesia. Through the estimation results carried out with the economic growth and inflation model with the trilemma policy variable, it can be seen that there is a varied response. Economic shocks or economic shocks that were generated due to trilemma policies on economic growth and inflation were due to the fragility of the Indonesian economy to the volatility of monetary policies implemented by Bank Indonesia. Where exchange rate stability reflects one of the goals of Bank Indonesia to create financial system stability, it needs to be harmonized with central bank intervention in the foreign exchange market (Juhro, 2017).

Another research from Yunita (2017) shows that Indonesia is still classified as a middle-income trap country, the effectiveness of monetary policy transmission in the short and long term through the reference interest rate channel has not been achieved. This also encouraged Bank Indonesia to open or loosen up the foreign exchange system so as to attract investment into the country. Economic openness by Bank Indonesia can take the form of *foreign direct investment* (FDI) or *international reserves* (Wardhono, 2019). The inflow of foreign capital into the country will indirectly have a *multiplayer effect* on the level of economic growth because the use of foreign capital in economic development will indirectly increase economic growth (Jhingan, 2004).

3.4 Combination of Trilemma Policies in Indonesia on Macroeconomic Stability

Basically, the combination of monetary policy has various patterns. Various factors can be explained that the trilemma policy is not the only policy that has an influence on macroeconomic variables (Hsing, 2012). *Fredman's theory* of the inflation factor also explains that economic growth, investment and government spending are greatly influenced by the level or how much inflation occurs (Mankiw, 2017). In each policy combination that is taken, in the end, it will give a different pattern of pressure on the Trilemma policy carried out by the central bank in a country. The considerations made by the central bank both look at the internal and external conditions of the central bank which will change the patterns of interaction or the impact of the mix on existing policies either with central government policies or in each region (Ito, 2008 and Aizenman, 2018).

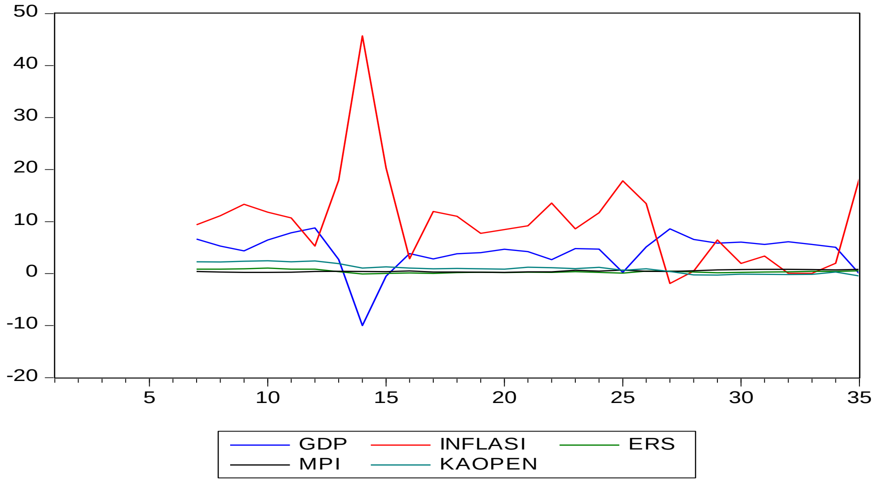

Figure 5 VECM Estimation Forecasting Results Model of Economic Growth, Inflation and Trilemma Policy in Indonesia (Source: processed data)

With the VECM estimation approach, the results of the trilemma policy in Indonesia which is so volatile can be predicted in the next year and can also be predicted to have an impact on macroeconomic variables, namely economic growth and inflation in Indonesia. Where the VECM estimation results to predict the rate of economic growth, the inflation rate and the trilemma policy index show a decline in economic growth in the coming year and the inflation rate has increased quite significantly in the coming year. The trilemma policy variables are exchange rate stability (ERS), monetary independence (MPI) and economic openness (KAOPEN) of 0.55%, 0.83% and -0.46%, respectively. This indicates that the trilemma policy imposed by Bank Indonesia with the Mundell's-Flaming model approach, which is still sacrificing economic openness and choosing to stabilize the exchange rate and monetary independence as the main objectives. Changes in economic growth and inflation rates based on the results of the implementation of the trilemma policy have an impact on lowering the rate of economic growth and increasing inflation.

Determination of the trilemma policy carried out by Bank Indonesia must also prioritize Bank Indonesia's objectives in maintaining and achieving exchange rate stability which will have an impact on financial stability. The *trade-off* policy undertaken by Bank Indonesia in determining the exchange rate regime also has an impact on the trilemma policy to be implemented. Changes in the exchange rate regime from *free floating* to *managed floating*, which means that the central bank intervenes in the foreign exchange market as a form of the objective of Bank Indonesia (Warjiyo and Juhro, 2016). Apart from the influence of the trilemma policies implemented by Bank Indonesia, the rate of economic growth and inflation in Indonesia is also heavily influenced by global economic and *geopolitical* turmoil. The uncertainty in determining policies, the volatility of world oil prices, the decline in world commodities and the ongoing trade war between countries have had a very strong impact on economic growth and inflation rates in Indonesia.

4. CONCLUSION

The Mundell's-Flaming trilemma hypothesis has provided an answer regarding the use of the trilemma policy which is considered a way for the central bank, especially Bank Indonesia, to implement monetary policy in accordance with the conditions of world economic development. Where the trilemma policy carried out by the Indonesian central bank has had an influence on economic growth variables and the inflation rate. Based on the analysis above, important conclusions are obtained in this study using descriptive analysis and the *Vector Error Correction Model* (VECM) method. There are two main points that are concluded in this research as follows:

1. The policy configuration carried out by Bank Indonesia was in accordance with Mundell's-Fleming hypothesis which experienced high fluctuation in Indonesia, mainly influenced by the economic shocks in 1997-1998 and the world financial crisis in 2008-2009. Economic growth, which has fallen sharply and exacerbated by the high rate of inflation, has had a strong impact on the monetary policy to be issued by Bank Indonesia as the monetary policy-making authority in Indonesia. Where Bank Indonesia uses a mix of monetary policies, namely the trilemma policy instrument, requires choosing two policies and sacrificing one policy which will have an impact on economic growth and the rate of inflation in Indonesia.

2. The influence of the trilemma policy on the variables of economic growth and inflation in Indonesia provides various answers. **Where the trilemma policy variables, namely exchange rate stability, monetary independence and economic openness in the short and long term affect the rate of economic growth and the rate of inflation.** This influence is seen based on the *Vector Error Correction Model* (VECM) method in which the Indonesian central bank experiences a trade off to determine the policies to be taken each year. For the prediction results based on the VECM analysis, that the trilemma policy to be carried out by Bank Indonesia sacrifices economic openness and chooses exchange rate stability and monetary independence as the best. Empirically this is in accordance with the research conducted by Hanno Back (2012) and Han and Shang (2016).

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