

SIMULTANEOUS ECONOMIC GROWTH AND INFLATION RATE THRESHOLD

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ABSTRACT

The study aims to test the simultaneous relationship between GDP with Money Supply, Inflation and Exchange Rate. The method used to test simultaneous equation model and inflation threshold level. The results obtained Amount of Money Supply have no significant relationship to GDP growth. Exchange has a two-way (simultaneous) relationship to GDP and has a significant negative effect. Likewise, inflation has a two-way relationship and has a significant positive effect on GDP growth. Exchange rate has a two-way relationship and has a negative influence on Money Supply. Likewise, Inflation has a two-way relationship and has a positive effect on Money Supply. The calculation results of the Inflation Threshold Level indicate that the inflation rate ≤ 1 percent has the highest adjusted R square, which is equal to 0.368. Judging from the parameters if inflation is ≤ 1 percent, then a 1 percent increase in inflation has a positive impact on increasing economic growth by 1.57 percent. The dummy variable coefficient (dummy) is - 0.100 indicating that if inflation above 1 percent negatively impacts economic growth by - 0.1 percent. From the results of testing the insignificant growth in the amount of circulating money or Money Supply to GDP growth gives an indication of money neutrality. In its development, although inflation tends to decline but is still above 1 percent quarterly and the exchange rate tends to depreciate, it can be concluded that Bank Indonesia's intervention in handling inflation and exchange rates hampers Indonesia's economic growth.

KeyWords : GDP, Money Supply, Inflation, Exchange Rate JEL: E 590

PREFACE

The last two decades are a very dynamic period and are colored by many important challenges and moments for the achievement of Indonesia's economic performance. Amidst the onslaught of two major crises, namely the 1997/98 Asian financial crisis and the 2008/09 global financial crisis, several stabilization and structural policy measures in the context of post-crisis economic recovery were taken by the Government together with Bank Indonesia, as well as related policy authorities to make the Indonesian economy grow stronger. However, the achievement of Indonesia's economic performance is quite alarming, with an average economic growth of around 5.2% in the last five years, and tends to decline from 5.56% in 2013 to 5.02% in 2016, away from the level of economic growth guarantee the creation of employment opportunities, which is around 6.50%.

Reviewing the Indonesian economy during the economic crisis of 1997 - 1999, where the onset of the economic crisis in 1997 was marked by negative GDP growth in 1997 of - 13.57 percent with inflation fluctuations of 50 percent and the crisis continued, marked by skyrocketing exchange rates foreigners from IDR 3725 per dollar and penetrate IDR 20,000 per dollar. The increase in foreign exchange rates is caused more by the increase in demand for foreign exchange due to the maturity of foreign debt. Although there is a Bank Indonesia Liquidity Assistance (BLBI) of around Rp. 750 trillion to help bank liquidity but is unable to prevent the bankruptcy of around 450 national banks. The above conditions give an indication of the strong influence of the money supply, inflation and foreign exchange rates in determining Indonesia's economic growth.

In various economic events it is found that several variables influence or simultaneously, such as economic growth will increase the income and demand of people for goods and services which then lead to rising prices. Inflation then causes a decline in public purchasing power which results in a decrease in national demand and output. The increase in the money supply has resulted in an increase in demand for goods and services and national output. While the increase in national output increases income and the amount of quasi money and the money supply.

Research objectives include :

- (1) Test the simultaneous relationship between Economic Growth with a variable Amount of Circulation, Inflation and Exchange Rate; and
- (2) Measuring the Level of Inflation Threshold.

LITERATURE REVIEW

Simultaneous Equations

Simultaneous equation is a model where there are more than one regression equation, where between one variable and another variable affect each other. Unlike the single equation, in the simultaneous equation model the parameter estimation cannot be done without considering the information in other equations (Gujarati, 2009). The simultaneous equation model becomes very complex, because this model can explain two-way relations between the variables.

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Concepts and Models

Considering there are differences in concepts in the regression and simultaneous equations, the terms used for variables are different, if in the regression equation we recognize two variable names, namely the independent variable and the dependent variable, then in the simultaneous equation, the term is no longer used. The terms used for variables in the simultaneous equation model are endogenous variables and exogenous variables (Nachrowi, 2006). Endogenous variables are variables whose values are specified in the model. While exogenous variables are variables whose values are determined outside the model. As the following model:

$$Y = \beta_0_1 + \beta_1_1 X_1 + \beta_2_1 X_2 \quad (2.1)$$

$$X_1 = \beta_0_2 + \beta_1_2 Y \quad (2.2)$$

$$X_1 = \beta_0_2 + \beta_1_2(\beta_0_1 + \beta_1_1 X_1 + \beta_2_1 X_2) \quad (2.3)$$

$$X_1 = (\beta_0_2 + \beta_1_2 \beta_0_1) + \beta_1_2 \beta_1_1 X_1 + \beta_1_2 \beta_2_1 X_2 \quad (2.4)$$

$$(1 - \beta_1_2 \beta_1_1) X_1 = (\beta_0_2 + \beta_1_2 \beta_0_1) + \beta_1_2 \beta_2_1 X_2 \quad (2.5)$$

$$X_1 = \frac{(\beta_0_2 + \beta_1_2 \beta_0_1)}{(1 - \beta_1_2 \beta_1_1)} + \frac{(\beta_1_2 \beta_2_1 X_2)}{(1 - \beta_1_2 \beta_1_1)} \quad (2.6)$$

From the 2.6 equation, if X2 is known, X1 will be known. Here the bar value of X1 is determined, so that the variable must be categorized as an endogenous variable. Furthermore, if X1 and X2 are known then Y can also be known, meaning that Y variables are also endogenous variables. In this equation, the only exogenous variable is X2.

The Quantity Theory of Money

Most preliminary studies investigate the relationship between various variables, especially money growth, inflation rates and economic growth. The popular theory explaining the relationship is the Quantity Theory of Money, indicating that the money supply (M) influences the price level (P) and output (Y). The quantity of money theory (QTM) is supported and calculated using the Fisher equation (1897) as follows:

$$M V = P Y \quad (2.7)$$

Dimana, M = The amount of money in circulation

V = Velocity of maney

P = Price

Y = Output(GDP)

The Quantity Theory of Money assumes only V is constant in the short run. Therefore the equation (2.7) can be rewritten as % $\Delta M = \% \Delta P + \% \Delta Y$. That means that a change in the amount of circulating money will affect changes in nominal GDP (% ΔY) and price changes (% P). As a consequence, from the monetarist side, controlling the money supply is a key variable in stabilizing the economy.

Likewise if the equation is changed to % $\Delta Y = \% \Delta M - \% \Delta P$. Means that economic growth (% ΔY) is determined positively by the growth of the money supply (% ΔM) and is weakened by the rate of change in prices or inflation (-% ΔP).

There are two types of theoretical expectations regarding the effect of changes in inflation rates and money on output growth (Chari et al., 1996). Based on the exogenous growth model, is that the inflation rate will not affect the level of growth and also the inflation rate against the level of output. In contrast to the endogenous growth model emphasizing that money and inflation do indeed affect the rate of growth of output. There are two channels for such effects. One argument is known as the Mundell-Tobin effect where the inflation policy increases growth more because inflation reduces human wealth, and to gather the desired wealth, people save more and will reduce the real interest rate and increase capital accumulation (Haslag, 1997). However, it is possible, arguing that inflation in such cases will affect savings and investment decisions that increase uncertainty due to the decline in real returns. This means that it can reduce productive capital and weaken output growth (Motley, 1994; and Miller and Benjamin, 2008).

Purchasing Power Parity (PPP) and the Quantity Theory of Money

One theory that explains the relationship between price levels or inflation with exchange rate movements is the purchasing power parity T theory, Fisher & Brown (1911). As an exchange rate theory, determining purchasing power parity (PPP) imposes in the direction of equilibrium exchange rates and domestic and foreign prices. Basically PPP is known as "one price law". The law of one price states that the price of traded commodities must be the same in various countries after calculating the exchange rate between currencies. The explanation of the PPP theory is closely related to the Law of One Price, which states that in a competitive market that is free from transportation costs and official trade barriers (eg tariffs), identical goods (of the same type) must be sold in various countries at the same price (if the price is expressed in the same currency unit). Thus the Purchasing Power Parity is stated in the following formula:

$$PPP = ER \frac{P^*}{P} \quad (2.8)$$

Referring to the law of one price, then

$$P = ER P^* \quad (2.9)$$

where, PPP is a Purchasing Power Parity or One Price Law;

ER is the domestic currency exchange rate against foreign currencies;

P* are foreign prices;and

P is domestic price

As is known the theory of money quantias and purchasing power parity are as follows:

$$M V = PY \quad (2.7)$$

$$P = ER P^* \quad (2.8)$$

substitute P from equation (2.8) to equation (2.7)

$$M V = ER P^* Y \quad (2.9)$$

From equation (2.9) we issue the exchange rate

$$ER = MV/P^*Y \quad (2.10)$$

From equation (2.10) can be interpreted when the exchange rate changes ($\% \Delta ER = \% \Delta M + \% \Delta V - \% \Delta P^* - \% \Delta Y$) can be caused by changes in the money supply (ΔM), changes in money circulation (ΔV) reduced by changes in outside prices country (ΔP^*) and change in output / GDP (ΔY).

There are a number of theoretical reasons for the 3 negative effects of depreciating foreign exchange rates. *First*, depreciation increases the price of traded goods, which enter the general price level, gives a negative effect on the real balance. This, in turn, will result in lower aggregate demand and output (Edwards, 1986).

Second, the contraction effect can also occur because of the effect of distribution depreciation on income. Diaz Alezandro (1963) argues that depreciation can lead to redistribution of income from people with a high marginal propensity to save high savings, causing negative effects on aggregate demand and output.

Third, if the demand for imported goods is inelastic because it is dominated by capital goods and semi-finished goods. In a country's basket of imports, depreciation may be contractive (Upadhaya and Upadhaya, 1999). Regardless of this demand side, the contraction effect can also arise from the supply side (Edwards [1986], Upadhaya and Upadhaya [1999]). Increasing import input costs due to depreciation of the foreign exchange rate can negatively affect production and output. So, while Hanson (1983) emphasizes the importance of imported inputs even in the production of non-traded (nontraded) goods. Lizondo and Montiel (1989) assert that it will reduce profits in non-contradicted goods caused by an increase in import input costs, causing a contraction in aggregate supply after depreciation.

Inflation Threshold Level

High and sustainable output growth in relation to low inflation is the main objective of macroeconomic policy. It is not surprising that the question and the relationship between inflation and growth is the subject of the thinking and debate of economists and researchers. Even though the debate about the accuracy of relations between these two variables is still open intensive research yields some important findings and the achievement of consensus on this relationship. It is generally accepted that inflation has a negative effect on economic growth in the medium and long term.

If inflation is contrary to growth, policy makers will certainly lead to low inflation. But how low is inflation? Should the inflation target be 10 percent, 5 percent or 0 percent? In addition, at what level of inflation does inflation and economic growth have a negative relationship? In other words, at what level of inflation does inflation have a positive relationship with growth and at what rate of inflation has a negative relationship. The inflation threshold level (inflation threshold level) indicates a turning point which initially shows the positive influence of inflation on growth and then a negative effect. The inflation rate that is higher than the threshold level causes the output growth to decline.

Previous research

Some economists say that there is a positive relationship between inflation and economic growth, while others argue that there is an opposite relationship between inflation and economic growth (Dholakin, 1990). Keynesian views or policies became more important during the period of the 1929 economic crisis. They believed that there was a positive relationship between inflation and economic growth. But in 1970 it was seen that the level of production decreased along with rising prices (Earbaykal and Okuyan, 2008). Research by Chaturvedi, Kumar and Dholakia (2009) examined the relationship between economic growth, savings and inflation rates for Southeast and South Asia in the framework of simultaneous equations by using the two least squares stages (2SLS) with the data panel. The relationship between savings rates and growth has occurred and 2-way and positive relationships have been found. Inflation has a very significant negative effect on economic growth but has a positive effect on savings rates.

Henry Thornton (1802) believed that more money was equal to inflation and the increase in money supply did not always cause an increase in economic output. Tobin and Clower (1970) found that changes in the money supply would affect short-term economic output. Stock and Watson (1989) research also found the same conclusions. Furthermore, McCandless and Weber (1995) through observing the level of output growth, the average rate of inflation and the growth of the last 30 years of money supply among 110 countries concluded that there was no correlation between the level of money growth and real output in the long run.

Mishra et al. (2010) conducted a study of the relationship between money, price, and output in developing countries, especially in India. Data on the money supply, price and output levels were examined from the period 1950 to 2009 using the vector error correlation model and co-integration test. In the long run, two-way causality is found between output and the money supply. In the short term, two-way causality is also found between the money supply and the price level.

In Sudan, Ahmed & Suliman (2011) examined three macroeconomic variables such as real gross domestic product, money supply and price level (CPI), annual data from the period 1960 to 2005. The Granger causality test showed that the money supply had a direct effect on the level product prices, but there is no causal effect between the money supply and economic growth.

The study of Ilyas, Sabir, Shehzadi and Shoukat (2014) examined the simultaneous equation between economic growth, savings and inflation as an endogenous variable while the unemployment rate, foreign direct investment, depreciation rate, real interest rate, total debt, indirect taxes and total investment as exogenous variables in Pakistan. Using the 2SLS method they found that inflation and real interest rates negatively and significantly affect economic growth, while the depreciation rate has a positive effect on economic growth. Economic growth, the unemployment rate and the real interest rate negatively affect the inflation rate. There is no significant relationship between inflation and savings. OLS findings show that the inflation rate of 9% is the Inflation Threshold Level for Pakistan's economic growth.

The relationship between economic growth and the money supply is a universal phenomenon for every government in the world. There are various studies that examine the possibility of a causal relationship between the money supply and economic growth. While most of these studies show monetary expansion as a driver of economic growth and some provide evidence to the contrary. Wun's (2016) study yields a number of key findings: one equation integrated between the three variables implies that there is a long-term relationship between the growth of the money supply, the rate of inflation and economic growth in China. Two-way causality between the growth of money supply and the inflation rate is found in the short term. Growth in the money supply and inflation rate causes economic growth while economic growth does not cause an increase in money supply and inflation.

The Akpan and Atan (2011) study examined the effect of exchange rate movements on real output growth in Nigeria. Based on the quarterly series for the period 1986 to 2010, it examines the direct and indirect possibilities of the relationship between exchange rates and GDP growth. This relationship is derived by using a simultaneous equation model in a defined macroeconomic model. A Generalized Method Moments (GMM) technique is explored. The estimation results show that there is no evidence of a strong direct relationship between changes in exchange rates and output growth. Conversely, the results of Mardiana's study (2016) show that the Inflation and Economic Growth rates simultaneously affect the Rupiah Exchange Rate of the US Dollar. Partially, the Inflation Rate has no effect on the positive direction of the Rupiah Exchange Rate on the US Dollar, and Economic Growth has a negative direction on the disclosure of the Rupiah Exchange Rate on the US Dollar.

Using data from 92 developing countries, Baglan and Yodas (2014) used a semiparametric data panel model for the period 1975 - 2004 found that significant inflation was associated with lower growth after reaching 12 percent.

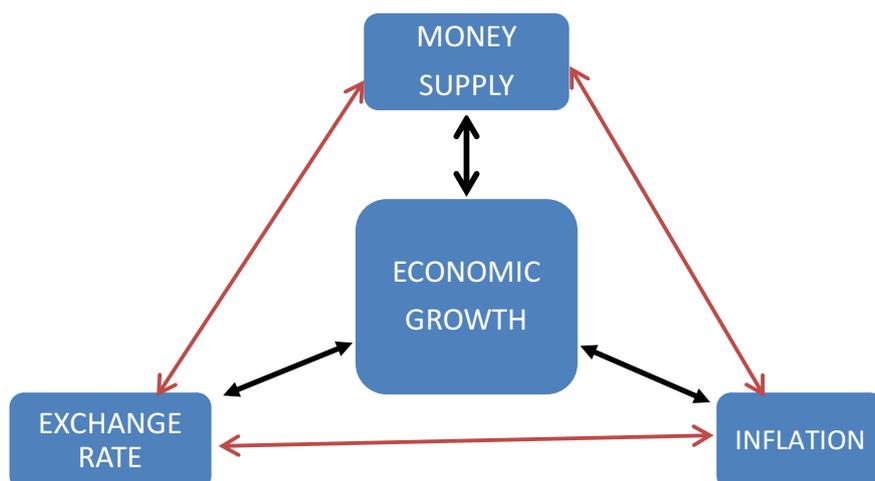
Using data from 140 countries (industrialized and developing countries) during the period 1960-98, Khan and Senhadji (2000) examined the existence of the threshold effect of inflation on growth. Utilizing their econometric methods, the inflation threshold for industrialized countries is estimated at 1 - 3 percent and 7 - 11 percent for developing countries.

Several studies have examined the effect of the threshold for inflation in Indonesia. Using multiple linear regression Khan and Senhadji (2001) found the inflation threshold in Indonesia was 7.11 percent. Meanwhile, according to Hansen's model (1997,2000) the inflation threshold in Indonesia is 9.53 percent. Chowdhury and Ham (2009) found that the inflation threshold in Indonesia was between 8.5 percent and 11 percent. Aziz and Nasrudin (2016) examine the relationship between inflation and economic growth in Indonesia. This research is based on the annual panel data collection of 30 provinces in Indonesia for the period 2011-2015. The results of this study indicate that there is a non-linear relationship between inflation and economic growth because there is a structural break point in the relationship. CSEP (Corrected Standard Error Panel) is used to analyze the inflation threshold level in Indonesia. The inflation rate below the threshold of 4.64% is still a positive influence on economic growth. Meanwhile, the inflation rate above the inflation threshold will have a negative influence.

Conceptual Framework

In Figure 1. Shows the frame of mind that explains the simultaneous or two-way relationship between economic growth and the amount of money circulating, inflation and exchange rates. In addition, the simultaneous relationship between the amount of money circulating and exchange rates and inflation.

Figure.1 Simultaneous Relationship Between Economic Growth and the Amount of Money Supply, Inflation and Exchange Rates



Hypothesis

1. H₀₁, There is no Simultaneous relationship between Economic Growth and the Amount of Money Supply;
Ha₁, there is a Simultaneous relationship between Economic Growth and the Amount of Money Supply .
2. H₀₂, There is no simultaneous relationship between Economic Growth and Inflation;
Ha₂, There is a simultaneous relationship between Economic Growth and Inflation;
3. H₀₃, There is no simultaneous relationship between Economic Growth and Exchange Rate;and
Ha₃, There is a simultaneous relationship between Economic Growth and Exchange Rate.

RESEARCH METHODOLOGY

Simultaneous Equation Model

The type of research that will be carried out is quantitative research with the Simultaneous Equation Model. As stated earlier that simultaneous equations are not the same as regression equations, where two variables are known, the independent variable and the dependent variable. In the simultaneous equation known endogenous and exogenous variables. Therefore, the use of OLS (Ordinary Least Square) cannot be directly used in simultaneous equations. The method used to estimate simultaneous equations one of them is the Two-Stage Smallest Squares (Two Stage Least Square) or abbreviated as 2-SLS. This method is very popular and is used very widely by various groups, mainly because of its superiority to obtain a single parameter estimate from the structural model. There are 4 models used to test for simultaneous relationships:

$$\ln PDB_t = \beta_0 + \beta_1 \ln JUB_t + \beta_2 \ln IHK_t + \beta_3 \ln Kurs_t + \epsilon_t \tag{3.1}$$

$$\ln JUB_t = \beta_0 + \beta_1 \ln PDB_t + \beta_2 \ln IHK_t + \beta_3 \ln Kurs_t + \epsilon_t \tag{3.2}$$

$$\ln IHK_t = \beta_0 + \beta_1 \ln PDB_t + \beta_2 \ln JUB_t + \beta_3 \ln Kurs_t + \epsilon_t \tag{3.3}$$

$$\ln Kurs_t = \beta_0 + \beta_1 \ln PDB_t + \beta_2 \ln JUB_t + \beta_3 \ln IHK_t + \epsilon_t \tag{3.4}$$

where, PDB is real Gross Domestic Product (constant 2000 GDP);
JUB is the Amount of Money in circulation, M2 (M1 + Quasi Money);
IHK is the Consumer Price Index;
Kurs is the rupiah exchange rate against the US dollar;
 ϵ_t is Error Term.

All variables in the model are endogenous variables.

Threshold Inflation Model

The threshold level for inflation and economic growth checks the turning point (inflection) or non-linear relationship between the analyzed variables. The model used to measure the inflation threshold level is like the model used by Ilyas, et al (2014), namely:

$$\ln PDB_t = \beta_0 + \beta_1 \ln Inflasi_t + \beta_2 2D(\ln Inflasi_t - K) + \epsilon_t \tag{3.5}$$

Where, Ln PDB is GDP growth in the quarter;
Inflasi is the quarterly inflation rate ;
D is a doll variable (Dummy), defined as follows:
D =1, If Inflation \leq K
D = 0, If Inflation $>$ K

Where K shows the weight of the inflation limit where structural breakdown occurs.
 ϵ_t is the term random error which is a measurement error on a variable.

The level of the inflation threshold is determined at that time where the R2 value is maximum. This also implies the most favorable threshold value which minimizes the remaining squares (RSS).

ANALYSIS AND DISCUSSION

Analysis

Testing of Simultaneous Equation Models

The test results of the four simultaneous equation models can be seen in Table 4.1. Overall the model is valid, due to the high coefficient of determination and statistically significant F at 0,000. The LnPDB test results show that the Amount of Money Supply (JUB) does not have a significant relationship to GDP growth. Exchange rates have a negative influence, 1 percent increase in exchange rate affects the decline in GDP growth by -0.202 percent. While inflation has a positive influence on GDP growth, a 1 percent increase in inflation has an impact on GDP growth of 1.556 percent.

Table 4.1 Test Results of Simultaneous Equation Models

Variable	Ln PDB	Variable	LnJUB	Variable	LnIHK	Variable	LnKurs
C	10,030	C	5,712	C	-2,919	C	15,365
(Prob.)	(0,000)	(Prob.)	(0,267)	(Prob.)	(0,003)	(Prob.)	(0,015)
LnJUB	-0,089	LnKurs	-0,451	LnPDB	0,234	LnIHK	5,081
(Prob.)	(0,633)	(Prob.)	(0,008)	(Prob.)	(0,023)	(Prob.)	(0,000)
LnKurs	-0,202	LnIHK	3,484	LnJUB	0,212	LnPDB	-1,110
(Prob.)	(0,087)	(Prob.)	(0,000)	(Prob.)	(0,000)	(Prob.)	(0,000)
LnIHK	1,556	LnPDB	-0,220	LnKurs	0,139	LnJUB	-1,007
(Prob.)	(0,023)	(Prob.)	(0,633)	(Prob.)	(0,000)	(Prob.)	(0,008)
<i>Adjusted R Square</i>	0,936	<i>Adjusted R Square</i>	0,975	<i>Adjusted R Square</i>	0,988	<i>Adjusted R Square</i>	0,792
Sig. F	0,000						

Testing of the LnJUB model shows that GDP does not have a significant influence on JUB. Kurs has a negative influence, 1 percent increase in exchange rates has a decrease in JUB - 0.451 percent. The increase in inflation by 1 percent will increase JUB by 3.484 percent.

Next the LnIHK test showed that a 1 percent increase in GDP would increase CPI or inflation by 0.234 percent. The increase of JUB by 1 percent will increase inflation by 0.212 percent. As for the 1 percent exchange rate increase, the inflation increase will be 0.139 percent.

Lastly, the LnKurs test showed that a 1 percent increase in inflation resulted in an increase in the rate of 5.081 percent. The increase in GDP by 1 percent will reduce the exchange rate by - 1.110 percent. The increase in JUB by 1 percent will reduce the exchange rate - 1.007 percent.

From the results of the above tests it can be concluded that GDP does not have a significant relationship with JUB. GDP has a negative 2-way relationship to exchange rates. GDP also has a positive 2-way relationship to inflation / CPI. JUB has a negative 2-way relationship to exchange rates and a positive relationship to inflation.

The results of this test are not in accordance with the research conducted by Huruta (2017) which shows the absence of a causality relationship between inflation and economic growth in Indonesia during the period 1965 - 2013, using the Granger Causality test. However, it is consistent with Hartini & Utomo (2004) research. Using Final Prediction Error introduced by Akaike (1969), the results of GDP affect inflation with the observation period 1973 - 2002. Likewise, what was done by Setyawati (2006), Maqrobi and Pujiati (2011), Mamo (2012) and Acyuninda (2012) prove there is a causal relationship between inflation and economic growth.

Testing the Level of Inflation Threshold

Test results (Table 4.2) Inflation Threshold Level on two possible inflation rates, ≤ 1 percent and ≤ 2 percent indicate that the inflation rate ≤ 1 percent has the highest adjusted R square, which is 0.368. This means that 36.8 percent of economic growth varies with inflation. Judging from the parameters if inflation is ≤ 1 percent, then a 1 percent increase in inflation has a positive impact on increasing economic growth by 1.57 percent. The doll variable coefficient (dummy) is - 0.100 indicating that if inflation above 1 percent has a negative impact on economic growth of - 0.1 percent. Both parameters are significant at a probability of 100 0.100 or 10 percent.

As for inflation ≤ 2 percent, Adjusted R Square is lower, amounting to 0.137 with an inflation parameter of 0.044 is not significant, so is the doll variable of - 0.077 not significant (probability is greater than 0.100).

Table 4.2 Testing the Level of Inflation Threshold

Variabel	K ≤ 1	K ≤ 2
	Ln PDB	Ln PDB
C (Prob.)	14,415 (0,000)	14,407 (0,000)
Inflasi (Prob.)	1,57 (0,043)	0,044 (0,137)
2D(Inflasi – K) (Prob.)	-0,100 (0,062)	-0,077 (0,229)
<i>Adjusted R Square</i>	0,368	0,137
<i>Std. Error of the Estimate</i>	.059	.064

This Inflation Threshold Test Results is ≤ 1 percent per quarter consistent with the research of Aziz and Nasrudin (2016) in the annual panel data collection of 30 provinces in Indonesia during the period 2011-2015. The inflation rate below the threshold of 4.64% per year still has a positive effect on economic growth. Meanwhile, the inflation rate above the inflation threshold will have a negative influence.

Compared to previous studies in Indonesia, Khan and Senhadji (2001) were 7.11 percent, Hansen (1997,2000) was 9.53 percent, and Chowdhury and Ham (2009) the inflation threshold in Indonesia was between 8.5 percent and 11 percent.

From the results of these comparisons, it can be concluded that the more current economic growth in Indonesia is increasingly critical of the inflation rate. In other words, a lower inflation rate is needed.

Discussion

From the results of testing the insignificant growth in the amount of money in circulation to GDP growth gives an indication of money neutrality. According to Lucas (1995) money neutrality is described as a situation in which changes in the money supply will only cause changes in nominal variables, such as price, nominal exchange rate, and nominal wages without causing changes in real variables such as output, consumption, investment and employment Opportunity. This idea was put forward by the classical economist Hume (1752) who stated that the increase in the money supply had no effect on employment or investment opportunities and the level or growth of output. Moreover, the concept of money supernaturality is also used, which states that changes in the growth of the money supply in the economy will not cause changes in real economic variables except changes in inflation rates. The long-term money neutrality hypothesis which is still an issue that is researched and tested for its existence is mostly based on classical monetary theory, neoclassical models or real business cycle models. These theories position that money is neutral in an economy that has no effect on real variables, because money only affects price levels whose ideas are in line with Hume and Lucas.

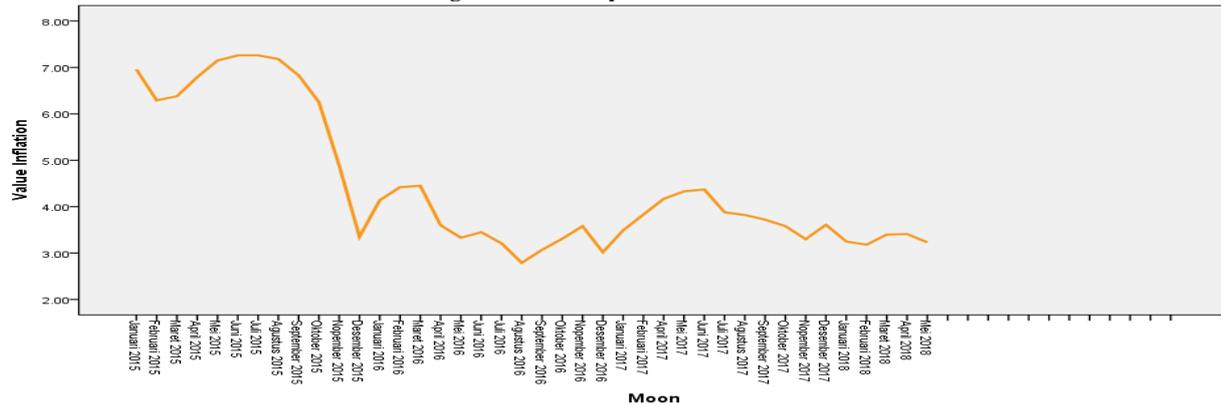
The simultaneous between the growth of the Amount of Currency in Inflation and Exchange Rate illustrates how the monetary policy pursued by Bank Indonesia affected various economic and financial activities so that in the end it could achieve the final goal set, namely economic growth. Specifically, Taylor (1995) states that the monetary policy transmission mechanism is a process in which monetary policy decisions are transmitted into changes in real GDP. The monetary transmission mechanism starts from the actions of the central bank using monetary instruments, whether OMOs or others, in implementing its monetary policy. The action then affects economic and financial activities through various channels of monetary policy transmission, namely the money channel, credit, interest rates, exchange rates, prices and expectations. The key to the effectiveness of monetary policy is the expectation of what future believers hold, holding the beliefs they have in the ability of the central bank to achieve their goals. In other words, credibility. When markets have confidence in the ability of the central bank to provide price stability, the central bank needs to do less to make it happen. And conversely, without credibility, more aggressive action is needed to achieve the same goal.

Credibility is a condition / condition that can be trusted and can be justified as it should be. How is the credibility of the Central Bank measured? The way to measure it is to see how closely inflation expectations are in line with the central bank's inflation target according to Demertzis & Viegli (2016). The closer they are to a sustainable period of time, the central bank is more credible. However, inflation itself is also important for credibility. If inflation deviates from the target for a long time, then it is expected to erode the Central Bank's credibility in the view of market participants.

Figure 4.2.1 shows the latest inflation developments from January 2015 to April 2018. Inflation has shown a downward trend, especially since March 2016. The decline in inflation was mainly due to changes in the Consumer Price Index from the Base Year from 2007 to 2012 which began in January 2014.

Judging from the average inflation of 4.44% higher than that targeted at the Minister of Finance Regulation NUMBER 93 / PMK.Oll / 2014 Concerning 2016 Inflation Target of 4.0%, 2017 is 4.0%, and Year 2018 by 3.5%. It is assumed that there is a relationship between changes in the base year of inflation and the achievement of the inflation target. Judging from the fluctuations it seems quite volatile, from the ratio of the standard deviation to the average (mean) is relatively high, namely 33.64%. Thus there is an indication of inflation volatility in Bank Indonesia intervention.

Figure 4.2 Development of Inflation

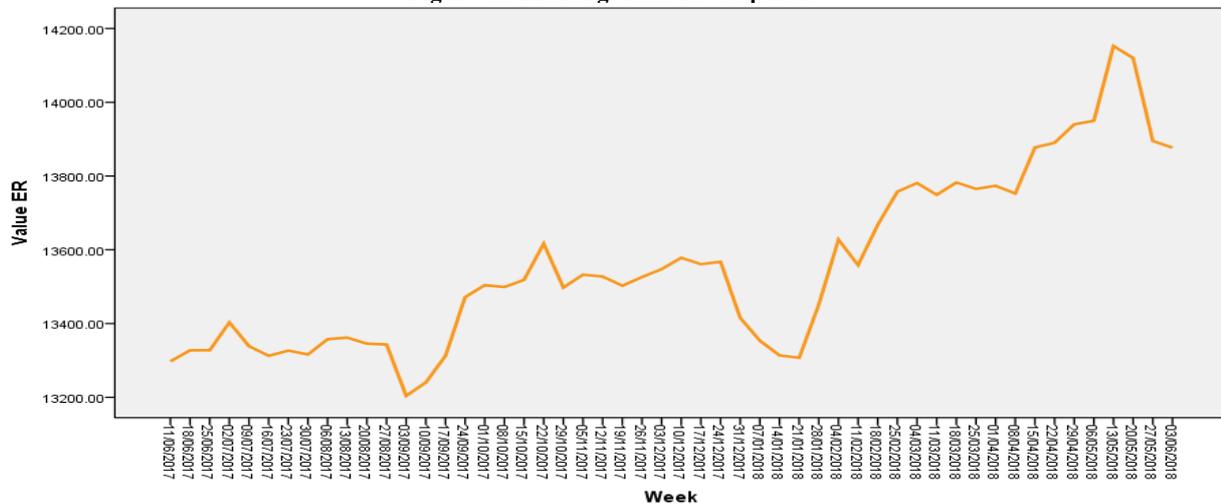


Explanation: Mean : 4.44% ; Stad. Deviation : 1.48

As for the development of the exchange rate (ER) from the second week period on June 11, 2017 until the first week, June 3, 2018 (see Figure 4.3). The tendency of depreciation is seen, from Rp. 13,297.5 (June 3, 2017) to Rp. 13,877.00 (June 3, 2018). The average exchange rate against USD is Rp. 13,558.10 and the standard deviation is 235.04, which looks less volatile. However, if seen from the tendency of depreciation and the possibility of BI intervention shows an increase, from 4 weeks, from Rp. 13,240.00 (10/09/2017) to Rp. 13,504.00 (01/10/2017) to 5 weeks from Rp. 13,877.5 (04/15/2018) to Rp. 14,152.5 (05/13/2018), giving an indication of BI's lack of responsiveness in controlling exchange rates. In fact, to intervene in the Foreign Exchange market is very possible because there is a large amount of foreign exchange reserves, around USD 128 billion. The wave of intervention in Bank Indonesia's foreign exchange is allegedly related to the profit motive (profit motive).

Results of the Research Szakmary and Mathur (1997) found that moving averages are used both in the futures market and the spot foreign exchange market to show that positive profits can be obtained in four of the five currencies that are examined significantly. The results are consistent for both sample and forward simulation tests. Regression results indicate that central bank intervention is closely related to the profitability of trade returns for the three major currencies (DM, Yen and Pound). Consistent with allegations in previous studies that 'news' about interventions tends to be revealed over the weekend, we find that the return on trading rules on the average moves significantly positively on Friday and Monday.

Figure 4.3 Exchange Rate Development



Agus (BI Governor) explained, in its activities BI could get a profit, and could also print a deficit which would have implications for its finances. BI activities referred to by Agus, including the stabilization of the rupiah exchange rate, as well as market intervention (Suryowati, 2015).

Bank Indonesia always benefits even though the rupiah is battered against foreign currencies. Throughout 2014, BI posted a profit of Rp 50 trillion (Serambi Minang, Wednesday 12 July 2018).

From the two figures above, in its development even though inflation tends to decline but is still above 1 percent quarter and the exchange rate tends to depreciate, it can be concluded that Bank Indonesia's intervention in handling inflation and the exchange rate hampers Indonesia's economic growth.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

1. The amount of money in circulation (JUB) does not have a significant relationship to GDP growth. Exchange rates have a two-way (simultaneous) relationship to GDP and have a significant negative effect. Likewise inflation has a two-way (simultaneous) relationship and has a significant positive effect on GDP growth.
2. The exchange rate has a two-way (simultaneous) relationship and has a negative influence on JUB. Likewise, Inflation has a two-way relationship (simultaneous) and has a positive effect on JUB.
3. The calculation results of the Inflation Threshold Level indicate that the inflation rate ≤ 1 percent has the highest adjusted R square, which is equal to 0.368. Judging from the parameters if inflation is ≤ 1 percent, then a 1 percent increase in inflation has a positive impact on increasing economic growth by 1.57 percent. The doll variable coefficient (dummy) is - 0.100 indicating that if inflation above 1 percent negatively impacts economic growth by - 0.1 percent.
4. From the results of testing the insignificant growth in the amount of circulating money to GDP growth provides an indication of money neutrality. Money neutrality is described as a situation in which changes in the money supply will only cause changes in nominal variables, such as price, nominal exchange rate and nominal wages without causing changes in real variables such as output, consumption, investment and employment opportunities.
5. In its development, although inflation tends to decline but is still above 1 percent quarterly and the exchange rate tends to depreciate, it can be concluded that Bank Indonesia's intervention in handling inflation and exchange rates hampers economic growth in Indonesia.

Recommendations

1. In setting the Inflation target, it should be determined by the Coordinating Minister for Economy, resulting from the coordination of the Department under the auspices of the Coordinating Minister for Economy such as Bank Indonesia, Ministry of Agriculture, Ministry of Finance, Ministry of Trade, Ministry of Industry and others. shorter time (quarterly) than annual as has been done so far.
2. For practitioners, transparency in the management of inflation and the exchange rate is further enhanced so that Bank Indonesia is more credible in the eyes of market participants. The time limit for intervention in the Foreign Exchange Market is a maximum of 3 weeks. Exchange rate appreciation is more important than profit motives in exchange rate intervention.

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