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The book is expected to be an input for the development of economics, specifically Monetary Economics and Macroeconomics. Specifically, in the form of developing dynamic models such as Structual Vector Auto Regression in studying and analyzing the impact of monetary policy on macroeconomic indicators

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Preface

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Medan, March 2020

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CHAPTER I
INTRODUCTION

Good or bad economic conditions that occur in a country is a manifestation of the policies that have been implemented in the country. Policies that affect macroeconomic conditions in Indonesia are monetary policy and fiscal policy. Monetary policy is a policy that aims to achieve a balance both internal and external. The intended internal balance includes high economic growth, price stability, broad employment opportunities and equitable development. While the external balance includes the balance of payments and the achievement of macroeconomic objectives in general.

Indonesia's monetary policy has undergone fundamental changes along with the issuance of Law No. 23 of 1999 Bank Indonesia (The central bank of Indonesia). First, monetary policy is now focused on maintaining rupiah (The rupiah (Rp) is the official currency of Indonesia) stability. Second, granting greater independence to Bnak Indonesia in determining its inflation target and monetary policy direction. Third, the decision on policy selection is left to the Governor of Bank Indonesia without intervention from the government and other institutions. Accountability and transparency in monetary policy require Bank Indonesia to announce inflation targets and monetary policy plans at the beginning of each year. And this reform is expected to be able to overcome the crisis in Indonesia (Nasution, 2018).

Theoretically there are two new macroeconomic flows that explain the impact of monetary policy namely the New Classical and New Keynessian. New Classic believes that monetary policy will only have an impact if the policy is not anticipated by the public. The essence of this flow states that monetary policy has no impact on the economy (cannot increase output or

reduce disruption) or money neutrality. While the New Keynesian school argues that monetary policy monetary policy can be used to influence the real economy or what happens here is money non-neurality. The development of these two ideas is increasingly pushing to prove the existence of which theories are in accordance with empirical studies (Sutikno, 2007).

Monetary policy instruments are easier to control than fiscal policy instruments. Because the control of the arrangement is in the hands of the central bank so it is easy to manage. But it still needs to be coordinated with the real sector, so that the achievement of the objectives of macro indicators is more likely to be achieved.

Indonesia is one of the countries affected by the economic crisis in 1997. Unstable economic conditions are illustrated by the always fluctuating number of macro indicators, and the inconsistency between the real sector and the monetary sector.

Fig. 1.1 (a) Trend in Bank Indonesia Certificate Interest Rate

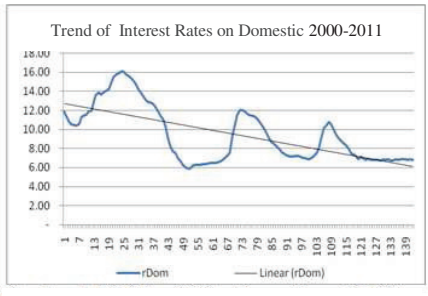


Fig. 1.1 (b) Trend in Interest Rates on

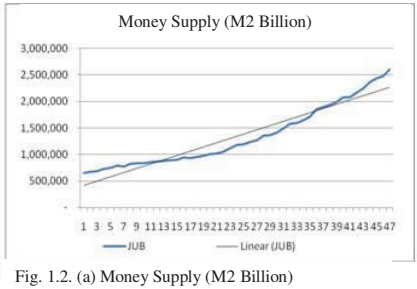


Fig. 1.2. (a) Money Supply (M2 Billion)

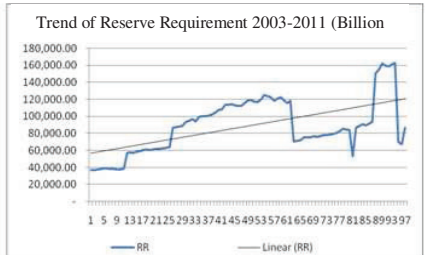


Fig. 1.2. (b) Trend in Reserve Requiremen 2003-2011

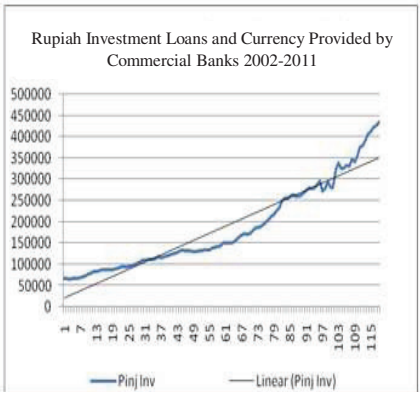


Fig. 1.3 (a) Trend in Rupiah Investment Loans and Currency Provided by Commercial Banks 2002-2011

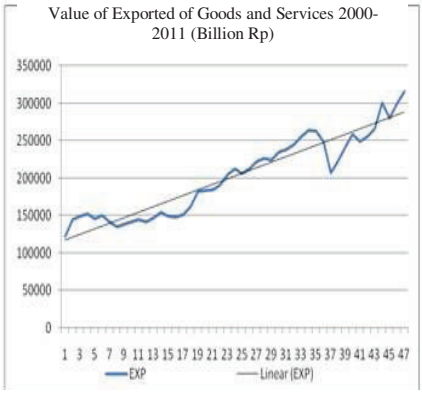


Fig. 1.3 (b) Trend in Value of Exported of Goods and Services 2000-2011 (Billion Rp)

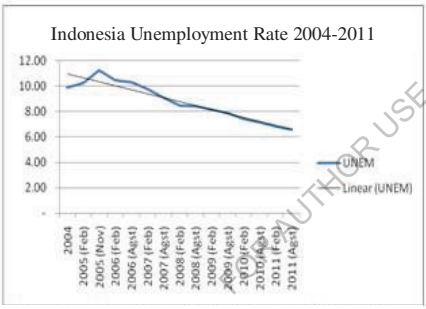
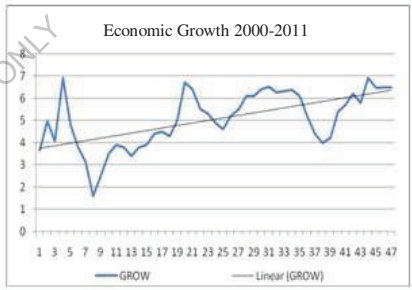


Fig. 1.4. (a) Indonesia Unemployment Rate 2004-2011



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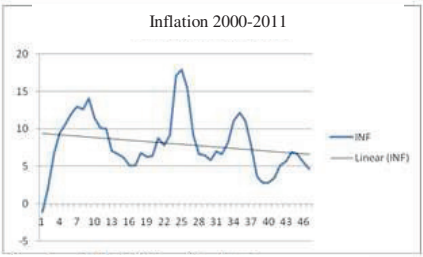

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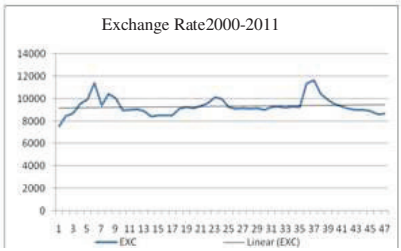


Fig. 1.5. (b) Trend in Exchange Rate 2000-2011

If we look at the trend of Trend in Bank Indonesia Certificate Interest Rate movement in the past decade, figure 1.1 (a), Bank Indonesia Certificate Interest Rate trend shows a declining trend. This condition was followed by a decrease in the domestic interest rate and an increase in the money supply (Figure 1.2 (a). At the same time, BI tended to increase the reserve requirement. Partially, the increase in the reserve requirement would have an impact on reducing the money supply (Pohan, 2008) and the amount credit disbursed, but from Figure 1.2 (b) and Figure 1.3 (a) this is not the case, the trend of the money supply actually increases, so does the amount of investment loan disbursed, slightly different from the results of research conducted by Julaihah (2004) , that in the decade under study, the increase in money supply was not channeled to the public, but instead was absorbed by the increase in reserve requirement, as a result the increase in money supply did not cause growth in the real sector.

The decline in domestic interest rates, in theory, will be responded by the world of work by increasing investment, increasing employment (decreasing the unemployment rate) and rising economic growth. This is also the case in Indonesia as shown in Figure 1.3 and Figure 1.4. The number of investment loans in rupiah and foreign currency provided by commercial banks during the 2002-2011 period has increased. As shown in Figure 1.1 (a), 1.2 (a), the decrease in interest rates is followed by the addition of JUB. However, if we look at Figure 1.5 (a), the inflation rate has a downward trend. This indicates that the increase in money supply is not significant enough to cause inflation. This is in line with the findings of Julaihah (2004) in his study, that an increase in the money supply causes the inflation rate to show a downward trend. This condition is certainly not in accordance with the quantity theory of prices presented by the monetarists, that an increase in the money supply will cause a proportional increase in inflation.

Controlled inflation amid a relatively slow domestic economic recovery pushed Bank Indonesia (BI) to maintain its monetary policy in July 2017. The BI Board of Governors' Meeting on July 19-20 2017 decided to keep the BI 7-day reverse repo rate at position 4, 75%, with fixed deposit and lending facility interest at 4% and 5.5%. According to BI, this decision is consistent with efforts to maintain macroeconomic stability and the financial system by considering the dynamics of the global and domestic economy. BI highlighted the process of Indonesia's economic recovery which was not as strong as originally estimated. Meanwhile, inflationary pressures are predicted to be lower than originally estimated due to weak demand and controlled food prices (Wardono, 2017).

In theory, interest rates, inflation and exchange rates will affect exports, and subsequently affect economic growth. In accordance with Mundell-Fleming theory, that a country that has a small open economy with a high level of capital mobility, a decrease in domestic interest rates will trigger capital out flow. As a result the exchange rate can go down so that the prices of domestic goods are relatively cheaper compared to the prices of goods in other countries. This condition will trigger an increase in exports. From Figure 1.3 (b) it can be seen that the export trend is increasing, but in Figure 1.5 (b) it can be seen that the exchange rate trend is relatively stable. This indicates that the decrease in the domestic interest rate (Figure 1.1 (b) in the long run does not affect the exchange rate trend which is relatively stable and the increase in exports is also not influenced by the exchange rate (ceteris paribus). On one hand the interest rate tends to decrease, but the exchange rate is relatively stable, so is the relationship of the exchange rate with exports, when the exchange rate of the rupiah against foreign currencies (say US dollars) is low, this means that the relative price of Indonesian goods is cheaper than foreign goods, this condition will trigger an increase in export

volume From Figure 1.3 (b) and Figure 1.5 (b) there is no long-term relationship between the exchange rate and exports, on the one hand the exchange rate is relatively stable while on the other hand exports continue to increase, also the relationship of the exchange rate with inflation, from the data There are indications that the stable exchange rate trend causes the inflation trend to fall, unlike research conducted by (Noer Azam Achsani and Herry Franki Nababan), who concluded that the depreciation of the exchange rate would lead to an increase in inflation especially in the transportation and communication group, this happened because there were still many domestic goods containing imported elements.

There are some interesting conditions that become a phenomenon of the Figure above, namely when Reserve Requirement trend rises, money supply trend also rises. Furthermore, if it is connected between money supply trend and the inflation rate trend, the existing conditions show that when there is an increase in money supply trend, the inflation trend shows a declining number. This is certainly not in accordance with the quantitative theory which explains that an increase in the money supply will cause a price increase in proportion.

The next phenomenon is that if it is connected between the RSBI trend and falling domestic interest rates, followed by an increase in investment trends, increased exports and increased economic growth, but the rupiah exchange rate trend is stable, this condition is actually not in accordance with the theory stated by Mundell-Fleming which states that when the central bank implements an expansive policy by adding money supply, it will reduce domestic interest rates. A decrease in the domestic interest rate below the international interest rate will encourage capital outflows, a large amount of capital outflows will cause depreciation of the rupiah against foreign currencies and this depreciation will trigger an increase in exports. But the

existing conditions that the value of the rupiah currency shows a relatively fixed trend (flat).

From the phenomena above, the writer wants to know the effect of the statutory Reserve Requirement on economic growth, inflation, balance of payments and the unemployment rate in 2000-2011 in Indonesia.

CHAPTER II
LITERATURE REVIEW

2.1 Monetary Instruments and Indonesian Macroeconomic Indicators

The central bank has a strategic function and role in supporting the development of a country's financial market and economy. This is partly because the policies adopted by the central bank can affect interest rates, the amount of credit and the money supply which in turn will affect not only the development of financial markets, but also economic growth, inflation and overall public welfare. The policy adopted by the central bank is known as monetary policy. Although the impact of implementing monetary policy is felt both directly and indirectly, it can be seen from the people's understanding of the nature of the existence of monetary policy itself.

Monetary policy is the policy of a monetary authority or central bank in the form of controlling monetary quantities to achieve the desired development of economic activity. In its implementation, the monetary policy strategy is implemented differently from one country to another, in accordance with the objectives to be achieved and the transmission mechanism that is believed to apply to the economy concerned. Based on the strategies and transmissions chosen, the operational framework for monetary policy was formulated.

The formal structure of the central bank in various countries follows a certain system. The establishment of a formal central bank structure aims to regulate the distribution of power in determining monetary policy. In general, the central bank functions as a check clearing, issuance of new money, withdraws its dangerous currency from circulation, evaluates proposals of mergers and expansions of commercial bank activities, administration and

provides loans to commercial banks, liaisons between the business community and the central bank, checks on the owners of bank companies , gathering data on local business conditions, using staff of professional economists to examine topics related to the formation of monetary policy (Manurung, 2009).

Monetary policy as one of the economic policies that play an important role in the economy. This role is reflected in its ability to influence price stability, economic growth, expansion of work, trade balance and balance of payments. Monetary policy is the policy of a monetary authority or central bank in the form of controlling monetary quantities to achieve the desired development of economic activity. In this case, the monetary amount (monetary aggregate) can be in the form of money supply, base money or bank credit (Sutardjo, 2005).

Boyes further (1991) argues, that monetary policy is applied in a certain time span and certain conditions (ultimate goals) of macro policies which include: (a) A high level of employment opportunities; (b) A low and stable rate of inflation; (c) Balance of payment balance; and (d) A steady level of economic growth.

Monetary policy mentioned above is an integral part of macroeconomic policy, which is generally carried out taking into account the cycle of economic activity, the nature of a country's closed or open economy, and other economic fundamentals. In its implementation, the monetary policy strategy is carried out differently from one country to another, in accordance with the objectives to be achieved and the transmission mechanism that is believed to apply to the economy concerned. Based on the chosen strategy and transmission, a monetary policy operational framework is formulated.

The main target of monetary policy, can only be seen achievement in a long-term perspective. That is, that everything is prepared now to achieve the

main target in the future. Meanwhile, the relationship between policy instruments and main targets through transmission channels is known as the monetary policy transmission mechanism. The main target as mentioned last lies in the most recent position of the various stages of the monetary policy transmission mechanism directed at efforts to fulfill it. The main target of meneter policy can be interpreted as a variable where the monetary authority cannot influence directly (Romer, 1996).

The implementation of monetary policy cannot be done separately from the application of other macroeconomic policies, such as fiscal policies, real sector policies, and others. This is especially true given the very close relationship between monetary policy and other parts of macroeconomic policy. In addition, the influence of policies that are applied together may have conflicting directions so as to weaken each other. For example, in an economy experiencing inflationary pressures, the central bank makes monetary tightening. At the same time, the government expanded the fiscal sector in order to encourage economic growth. The disharmony of the two policies can result in the goal of suppressing inflation not being achieved. Meanwhile, a combination of monetary and fiscal policies that are too expansive due to lack of coordination can encourage heating of economic activity. Thus, to achieve optimal macroeconomic policy objectives, a policy mix "policy mix" is usually applied coordinated between one policy and other policies (Warjiyo and Solikin, 2003).

The overall policy objective is the achievement of macroeconomic sabability, whether it is monetary policy or macroeconomic policy. Macroeconomic stability, among others, price stability (low inflation), economic growth, and availability of jobs / employment opportunities. Achievement of all objectives simultaneously is impossible, because the achievement of all targets is contradictory. So if you want to achieve a goal,

then other goals must be sacrificed. For example if economic growth and reducing unemployment are the goals, then this business is usually followed by price increases so that the achievement of macroeconomic stability is not optimal.

This naturally happens, so that later the central bank will be faced with two choices. The first choice is to choose one of the targets to be achieved optimally by ignoring other targets, for example choosing a high level of economic growth by ignoring the inflation rate. The second option is that all goals are strived to be achieved, but none is optimally achieved; for example, want economic growth that is not too high in order to maintain the inflation rate in accordance with specified. Recognizing this weakness, today some countries have gradually shifted to implementing monetary policy that is more focused on a single target, namely price stability.

Monetary economic policy instruments can affect macroeconomic stability indirectly. The success or failure of the working monetary policy instruments can be measured from macroeconomic indicators. When there is a fairly stable economic growth in the long run, it means that monetary economic policy instruments have succeeded. The operational process of monetary control begins with the preparation of monetary programming "monetary programs". The monetary program is basically a policy plan for controlling the money supply aimed at achieving the ultimate goal of monetary policy. This monetary program includes setting operational targets for monetary policy. Bank Indonesia then applies the steps that must be taken and determines the instruments that will be used to influence the operational targets. There are three main instruments in monetary policy, namely:

a. Open market operations, buying or selling government bonds.
b. Discount rate policy (setting interest rates) whereby member banks can obtain reserve loans from the central bank.

c. reserve requairements policy, changes in the ratio of official reserve requirements for bank deposits and other financial institutions.

The money supply consists of two components, namely components M1 and M2. M1 consists of assets that can be used directly, instantly and without obstacles in making payments. This asset is liquid. Assets are said to be liquid if they can be quickly, easily and cheaply used in making payments. M1 deals with most traditional definitions of money as a means of payment. While M2 puts illiquid assets instantly. If the central bank wants to change its final goal, then what needs to be done is to change the available monetary policy instruments.

In setting monetary policy, the Central Bank directly uses the instruments or variables that are in its control, namely open market operations, discount rates and bank reserves required. These variables help in determining the size of bank reserves, money supply and interest rates - that is, the intermediate target in monetary policy. In the end, the central bank is a partner with fiscal policy towards the ultimate goal of rapid GNP growth, low unemployment and stable prices. But usually the central bank focuses its attention on the intermediate goal of setting money growth goals or interest rates (Samuelson and Nordhaus, 1997).

2.2 Effectiveness of Interest Rates and Money Supply as Target

Which is more effective as a target between (indicators) interest rates or money supply or monetary aggregates. To answer this question, a more detailed and rational explanation is needed. The following is explained in more detail about the explanation of controlling money stocks through the analysis of demand and supply of money.

The empirical model of money demand is a function of the price level, the level of real income and the nominal interest rate. The empirical money

supply model is a function of money stock in the broadest sense and interest rate, namely:

$$m_t - p_t = \alpha_0 + \alpha_1 y_t - \alpha_2 R_t + \varepsilon_t$$

$$m_t = p_t + \alpha_0 + \alpha_1 y_t - \alpha_2 R_t + \varepsilon_t$$

$$m_t = \theta_0 + \theta_1 H_t + \theta_2 R_t + \mu_t$$

The impact $\varepsilon_t, \mu_t, y_t and P_t$ results in the expected value of the money stock being equal to the actual real money stock ($M_t^e = M_t$) each as follows:

$$m_t^e = p_t^e + \pi_0 + \pi_1 y_t^e - \pi_3 R_t + 0$$

$$m_t^e = \theta_0 + \theta_1 H_t + \theta_2 R_t + 0$$

Assuming that the average value of E $[\varepsilon_t] and E[\mu_t]$ is zero, consequently the demand and supply of money stock is balanced by eliminating the interest rate $[R_t]$ because the demand and supply of money stock and the interest rate are endogenous variables. The amount of money in the broadest sense is as follows:

$$R = \frac{[\pi_2 + \theta_2] m_t^e - \theta_2 [P_t^e + \pi_1 y_t^e] - [\pi_0 \theta_2 + \pi_2 \theta_0]}{\pi_2 \theta_1} \qquad (2.1)$$

Substitution equation (2.4) will produce a balance of supply and supply of nominal money stock as follows:

$$m_t = \frac{\pi_2 \theta_1 H_t + \theta_2 [P_t - \pi_1 y_t] + \pi_0 \theta_2 + \pi_2 \theta_0 + \pi_2 \mu_t}{\pi_2 + \theta_2} \qquad (2.2)$$

And substitution (2.1 to (2.2) will produce a difference in the amount of demand for nominal money stock with the target of offering money stock, namely:

$$m_t = m_t^e + \frac{\pi_2 \ [P_t - P_t^e] + \theta_2 \pi_1 \ [y_t - y_t^e] + \theta_2 \varepsilon_t + \pi_2 \mu_t}{\pi_2 + \theta_2} \qquad (2.3)$$

The square of the difference between money demand and money supply is called the Mean Square Error (MSE), which is:

$$MSE = E[m_t - m_t^e]^2 \qquad (2.4)$$

For example $z_t = [P_t - P_t^e + \pi_1\ [y_t - y_t^e] + \varepsilon_t$ so that controlling the difference in demand and supply of money stock can be formulated into:

$$m_t - m_t^e = \frac{\pi_2\ \mu_t + \theta_2\ z_t}{\pi_2 + \theta_2} \qquad (2.5)$$

Equation (2.5) explains the mismanagement of money stocks is the weighted average of the money supply shock [mt] and the money demand shock [zt]. Formally, $E[z_t] = 0$, $E[z_t^2]$, and $E[z_t\ z_{t-i}] = 0$ for i = 1, 2, 3, ..., n. Apply the two-variable variance formula to obtain MSE is

$$E\ [m_t - m_t^e]^2 = \left(\frac{\pi_2}{\pi_2 + \theta_2}\right)^2 \sigma_\mu^2 + \left(\frac{\theta_2}{\pi_2 + \theta_2}\right)^2 \sigma_\varepsilon^2 + \left(\frac{2\pi_2\ \theta_2}{(\pi_2 + \theta_2)^2}\right)\ \text{cov}\ [\mu_t, z_t] \qquad (2.6)$$

It is known that the values of zt and mt are independent or uncorrelated so that cov $[z_t, \mu_t] = 0$. Therefore, equation (2.7) can be written as:

$$E[m_t - m_t^e]^2 = \frac{\pi_2^2\ \sigma_\mu^2 + \theta_2^2 \sigma_z^2}{(\pi_2 + \theta_2)^2} \qquad (2.7)$$

Equation (2.7) explains that mismanagement of money stocks is determined by the shock of the behavior of commercial banks [mt] and the shock to the behavior of the public in holding money [z_t]. What is the effectiveness of controlling money stock with the interest rate instrument [R_t] which is:

$$m_t - m_t^e = [P_t - P_t^e] + \pi_1\ [y_t - y_t^e] + \varepsilon_t$$

$$E[m_t - m_t^e]^2 = \sigma_z^2 \qquad (2.8)$$

From equations (2.7) and (2.8) it can be concluded that the policy of controlling money stock by:

a. The money stock instrument in the broadest sense is better than the interest rate instrument if $\sigma_\mu^2 \leq \sigma_z^2$ or the shock at the behavior of commercial banks is smaller or equal to the shock at the behavior of people holding money.
b. The interest rate instrument is better than the money stock in the broadest sense if $\sigma_\mu^2 > \sigma_z^2$ or the shock at the behavior of commercial banks is greater than the shock at the behavior of people holding money.
c. It can be further defined if the α_2 parameter is greater than the θ_2 parameter or the money demand schedule is more elastic than the money supply schedule. The interest rate instrument is more effective than the money stock instrument in the broadest sense. Conversely, if the θ_2 parameter size is smaller than θ_2 or the money demand schedule is more inelastic than the money supply schedule, then the money stock instrument in the broadest sense is more effective than the interest rate instrument (Manurung, 2009).

So to stabilize the income level, monetarists are more likely to choose the money supply as an indicator rather than interest rates. They further argued that fluctuating price levels as a result of monetary actions intended to maintain the stability of the interest rate would in the future cause fluctuations in interest rates. This additional reason further strengthens their opinion to reject interest rates as an indicator (Pohan, 2008).

Poole (1970) identified three alternative monetary policy strategies, namely: the money stock targeting strategy, the interest rate targeting strategy, and the systematic combination strategy between the target money supply volume and the interest rate. These three strategies are more relevant to be applied in a closed economy (low degree of mobility) or in an open economy

that implements a floating exchange rate policy because only in these two forms of economy does the monetary authority have complete independence in controlling the money supply and / or interest rates domestic.

Using the IS-LM model framework, Poole (1970) shows that between two extreme choices: the money supply anchor and the interest rate anchor, the right strategy depends on the type of macroeconomic pressures that occur. If an economy experiences real shocks so that the IS curve shifts, then the money supply anchor strategy is a more appropriate choice because changes in interest rates (for a closed economy) or changes in the exchange rate (for an open economy) will reduce pressures and minimize the negative impact on price or production stability. Conversely, if what happens are monetary pressures (monetary shocks) that shift the LM curve, the more appropriate is the interest rate anchor strategy because changes in the money supply or balance of payments will reduce these pressures and minimize their negative impact on price or production stability.

In addition to the alternative strategies above, there are two other strategy choices, namely the exchange rate anchor strategy and the inflation targeting anchor (Houben, 1997). Like the interest rate anchor strategy, the exchange rate anchor strategy is more suitable for an economy that is experiencing monetary pressures, especially in the form of fluctuations in money demand. In this case, these pressures will be mitigated by adjustments to the balance of payments so that their negative impact on price stability and production can be minimized.

The alternative anchor strategy for the inflation rate is particularly appropriate to be applied in an economy that is experiencing both huge monetary and real pressures at the same time. The main advantage of this strategy lies in its ability to directly influence inflation expectations and at the

same time continue to provide authority to the authorities in preparing the right response to various pressures that hit the economy.

The positive influence between inflation and monetary policy. Statutory Reserves and interest rates have a positive and significant effect on inflation in Indonesia in the short term (Sir, 2015). The alternative anchor strategy for the inflation rate is particularly appropriate to be applied in an economy that is experiencing both huge monetary and real pressures at the same time. The main advantage of this strategy lies in its ability to directly influence inflation expectations and at the same time continue to give authority to the authorities in preparing the right response to various pressures that hit the economy.

2.3 Mundell-Fleming Model

The Mundell-Fleming model describes how the balance of financial markets and goods markets in an open economy, and adheres to an exchange rate regime (Andysmith, AtD, et al. 1995; Mankiw 2000; Taylor, 1999). The main assumptions of this model are described as follows.

a. The domestic economy is a small country economy when compared to the economy of the entire world, so variables such as income, prices and interest rates are exogenous.

b. The domestic economy produces goods containing imported raw materials that are traded on the international market and is a perfect substitute for goods on the international market.

c. Domestic demand is determined by a constant P price.

`The price of foreign currencies from world production P* is also assumed to be cash. Representation of Exchange Rates e = nominal exchange rate, measured as the number of units of the domestic currency per unit of foreign currency, for example £ 0.645 = 1 Euro. An increase in the exchange rate is a depreciation in the value of the domestic currency.

The Balance of Goods Market and IS Curve.

In a closed economy, the conditions of equilibrium are:

Y = E (2.9)

Where, Y = Real Output

E = Real Expenditures

In an open economy, the conditions of equilibrium are:

Y = D (2.10)

Where, D = Domestic Request

D = C + I + G + X – M (2.11)

T = Real Trade balance

Real Private Sector Consumption $C = c_0 + c_1 Y$ (2.11A)

Real Private Sector Investment $I = i_0 - i_1 r$ (2.11B)

Real Government Expenditure $G = \overline{G}$ (2.11C)

X = Real export value

Z = Real import value (measured in domestic output)

Export

$$X = X\left(\frac{eP^*}{P}, Yw\right)$$

$\frac{eP^*}{P}$ Real exchange rate

Y_w Real world income

The value of world income is assumed to be constant. With P and P* also constant, this argument emphasizes if this variable is included in the function.

$$Z = z_0(e, Y)$$

$\frac{dz_o}{de} \prec 0;$ z_1 = marginal propensity to import $0 < z_1 < 1$

2.4 Growth Theory of Sollow Swan

Over time and with a shift in the flow of thought from Classical to Neo-Classical, the process of Neo-Classical economic development occurs because of the accumulation of capital, where the development is a gradual and harmonious and cumulative process. Neo-Classical Theory is optimistic about economic development, according to them economic development is a process of increasing the production of goods and services due to developments in the number and quality of production factors.

In the 1960s, the theory of economic growth was dominated by the Neo-Classical model. The most important contribution was made by Solow and Swan, emphasizing the importance of saving and capital formation for the economic development and sources of growth of a country. By using the Neo-Classical production function, where the model specification assumes a constant return to scale, diminishing returns for each input, and positive elasticity of substitution between inputs.

Mankiw (2007); Romer (1996) describes how capital accumulation, population growth and technological progress affect a country's economic growth. The supply of goods in the Solow-Swan Model assumes the use of two kinds of inputs from the production function it uses, namely capital (K) and labor (L); in the form of the following production functions:

$$Y = F(K,L) \qquad (2.12)$$

It is assumed that this production function is constant (constant return to scale), this is done to facilitate analysis. This production function is said to meet the assumption of constant return to scale if it satisfies this equation:

$$zY = F(zK, zL) \qquad (2.13)$$

Where $z > 0$, and if these variables are divided into the number per worker, so z=1/ L then the equation becomes:

$$\frac{Y}{L} = F(K/L, 1) \qquad (2.14)$$

From this equation it is known that the amount of output per worker Y / L is a function of the amount of capital per worker K / L (number one shows a constant so that it can be omitted) and this equation is not influenced by economic conditions.

Previously it has been explained how economic growth in the steady state at the level of the golden rule was achieved. At that time it was assumed that the population and labor force were constant while high saving rates could only achieve high growth that was temporary and unsustainable. So as to explain sustainable economic growth the Solow model must be expanded to include two other sources namely population growth and technological progress.

Starting with how population growth can affect capital accumulation per worker. Now there are three variables that influence capital accumulation per worker besides k or K / L and γ or Y / L, namely the growth in the number of workers who have a negative relationship with capital accumulation per worker. So it can be written as:

$$\Delta k = i - (\delta + n)k$$

2.5 Inflation, Growth and Unemployment

In the long run, real income or the level of employment is basically determined by the supply side, other factors such as welfare policies and other policies determine market flexibility (ECB, 2004, p. 41). On the other hand, Olivier Blanchard, Chief Economist of the IMF, believes that monetary policy affects the unemployment rate, both actual and natural (Blanchard, 2011, p.

4). Developments over time indicate that unemployment is growing gradually. Unemployment grows dramatically during a recession and can return to its original level after a recession.

Monetary policy affects economic activity through several channels including interest rates, bank loans, asset prices, exchange rates and expectations (Mishkin, 1996; ECB, 2004). Romer and Romer (1994) argue that monetary policy is a key variable to end a recession. There is strong evidence that monetary policy is the most effective policy during a recession (Lo and Piger, 2005). Peersman and Smets (2001) found that for European countries, the effect of interest rate shocks on output almost doubled during a recession. This shows that monetary policy reaction might be important in understanding unemployment behavior from time to time (Stockhammer and Simon, 2008).

Monetary policy also plays a role in the growth of the real sector. This monetary policy is indeed very effective to reduce some of the reactions from the market. With the weakening of the real sector, Bank Indonesia, which has a role in the real sector, will slowly reduce interest rates to increase creative power and competitiveness in the real sector (Putra, 2015).

NAIRU (Non-Accelerating Inflation Rate of Unemployment) is defined as the unemployment rate where the inflation condition is stable. This condition is sometimes also referred to as long-term or structural unemployment. If unemployment falls below NAIRU, workers can ask for higher wages, which in turn causes companies to increase the rate of price growth. If inflation rises again it will cause an increase in nominal wage claims and trigger a price-wage spiral (Layard et al, 1991; Carlin and Soskice, 2006).

Some macroeconomic variables that can affect NAIRU are capital accumulation and interest rates. Reduction of capital during a recession will

cause a decrease in share capital (in parallel with rising unemployment). If the level of substitution between capital and labor is limited, then positive shocks from demand will have an inflationary effect on the level of low-level workers and NAIRU will increase (Rowthorn, 1995, 1999; Bean, 1989). Increased interest rates can affect NAIRU directly (Hein, 2006) and have a negative effect on capital accumulation.

The NAIRU model is used to analyze monetary policy using the Phillips curve model as a fixed characteristic, namely the treatment of inflation expectations and the degree of uncertainty about NAIRU. The variation in time and accuracy in estimating NAIRU has led economists to conclude rejecting the Phillips curve paradigm (Issard, Laxton and Eliasson, 1999). NAIRU is the limit where the unemployment rate does not cause an acceleration in the rate of aggregate inflation deviation with core inflation.

The results of the conventional probability simulation rules from Taylor (1993; 1999), IFBI (inflation-forecast based) rules with leveling of interest rates from Clarida, Gali and Gertler (1998), IFB2 (inflation-forecast based) rules with interest rates from Isard and Laxton , (1998) and the first difference rule with interest rates from Levin, Wieland and Williamson (1999) have demonstrated that inflation expectations have a component model consistent with forward-looking component considerations and monetary policy guidelines for backward-looking component considerations for measure the real interest rate.

The Phillips konvex curve model developed by Laxton Rose and Tambakis (1999) includes the estimation of two equations, namely the Phillips curve with an aggregate consumer price index and an index of consumer prices without food and energy. This Phillips curve model explains the dynamics of inflation expectations and the unemployment rate. In Figure 2.2 it is explained that the deviation of aggregate inflation with core inflation

(vertical axis) and unemployment rate (horizontal axis). Core inflation is a synonym of expected inflation (the expected-augmented Phillips curve) consistent with equation (2.43). The short-run Phillips curve is a convex with horizontal asymptotic is on $\pi - \pi^e = -\lambda$ with vertical asymptotic on $u = \theta$.

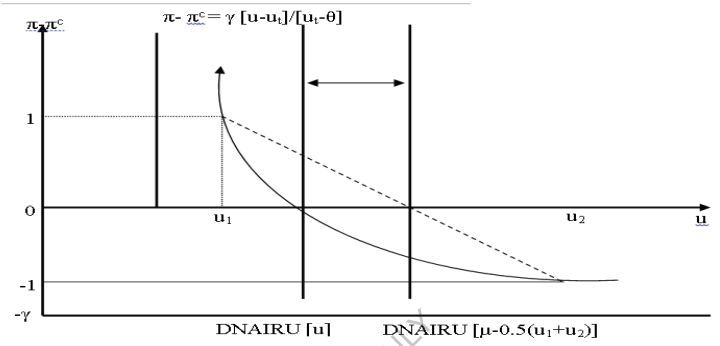


Figure 2.2. Phillips Curve NAIRU Convex

2.6 Monetary Policy Transmission Mechanism

The monetary transmission mechanism basically describes how the monetary policy pursued by the central bank is transmitted and influences various economic and financial activities so that it can ultimately reach the ultimate goal of monetary policy. Specifically, Taylor (1993) states that the monetary policy transmission mechanism is "the process through which monetary policy decisions are transmitted into changes in real GDP and inflation".

Monetary policy transmission basically shows the interaction between central banks, banks and other financial institutions, and economic actors in the real sector through a two-stage process of money circulation in the economy. First, interactions that occur in financial markets, namely

interactions between the central bank and banks and other financial institutions in various financial transaction activities. Second, interactions related to the intermediation function, namely interactions between banks and other financial institutions with economic actors in various economic activities in the real sector.

Transactions through the financial market occur because, on one hand the central bank conducts monetary control through financial transactions conducted with banks, both for their own interests and for the interests of their customers. On the other hand banks and other financial institutions conduct financial transactions for their investment portfolios. This interaction can occur through the rupiah money market, the foreign exchange market, or the capital market. Thus, the interaction between the central bank and the banking system both directly and indirectly will affect the development of both the volume and prices that occur in the three financial markets.

The banks in their operations carry out foreign exchange transactions both for their own interests or to meet the demands of their customers. The interaction between the central bank and the banking system will influence the development of the exchange rate and foreign exchange transaction volume (spot, forward, swap) as well as the position of foreign exchange reserves held by the central bank and banking.

The interaction between the central bank and banks in the rupiah and foreign exchange money markets will affect developments in the capital market.

This happens because investors generally invest their funds in an investment portfolio consisting of instruments or products that are traded on the money market, the forex market, and the capital market. The monetary policy transmission mechanism basically examines five monetary transmission channels, what is meant is the money channel (money channel),

interest rate channel (interest rate channel), asset price channel (asset price channel), credit channel (credit channel), and expectations channel (expectation channel).

CHAPTER III
MODEL FORMING

Based on the literature review described earlier, the temporary conclusion that monetary policy instruments can affect macroeconomic indicators both directly and indirectly. The impact of changes in macroeconomic indicators as a result of changes in instruments is not instantaneous, but requires a certain time in accordance with the number of intermediate variables, the longer the intermediate variable, the longer the time lag, meaning that the longer the intermediate variable, the longer the change in macroeconomic indicators occurs, and vice versa Macroeconomics can change immediately if there are no intermediate variables that hinder monetary policy instruments and macroeconomic indicators.

As explained in the study of Julaihah (2004), which states that an increase in the money supply does not cause growth in the real sector, because the addition of the money supply is not distributed to the public but what happens is that all is absorbed by the statutory reserve, so what happens when the amount of money circulating up then the statutory reserve must also increase.

While the minimum statutory reserve is an instrument used by Bank Indonesia to regulate the money supply. When Bank Indonesia wants to reduce the money supply, what is done is to increase the statutory reserve requirement, and vice versa when the money supply is to be increased, Bank Indonesia will reduce the statutory reserve requirement, because by lowering it, the obligation to save its reserves is smaller and the amount of money which can be circulated to the public becomes bigger. As in the research of Didik (2000) and Sutardjo (2005) it is said that the control efforts undertaken by Bank Indonesia in anticipating the development of excessive lending,

Bank Indonesia undertook prudent monetary policies, among others, by raising the minimum statutory reserve requirement (RR). This will limit lending among banks.

The minimum capital requirement (CAR) has an impact on the low level of bank lending (KRD). The greater the CAR ratio set by Bank Indonesia will cause the smaller amount of credit that can be distributed by banks, as a result it will also affect the decrease in the money supply. A decrease in the money supply drives the exchange rate to appreciate, and a decrease in the exchange rate causes exporters to reduce exports' intentions.

Beer fluctuations in the value of the rupiah as an effect of monetary policy, will be adjusted through the influence of interest rates and the effect of exchange rates on export offers (Santoso, 1998; Sutardjo, 2005).

The increase in money supply as a result of the implementation of expansive monetary policy can increase domestic prices through decreasing nominal interest rates causing the exchange rate to depreciate and the competitiveness of domestic products to increase (Mankiw, 2000).

High and low levels of inflation can be caused by many factors. In relation to the exchange rate or exchange rate (ER). The depreciation of the exchange rate caused an increase in domestic production and distribution costs which eventually led to inflation. In addition, inefficiencies and imbalances in the structure of economic fundamentals can deepen the pressure on the inflation rate (Wijoyo and Reza, 1998).

Changes in the balance of demand and supply of money will determine the price level, changes in the price level determine the inflation rate, and the inflation rate affects the nominal interest rate. Because it is a cost of holding money, the nominal interest rate can affect money demand (Mankiw, 2000).

Aggregate demand and economic activity are determined by controlling money supply (verticals), in line with the development of the financial system

and the payment system, which work more efficiently based on market mechanisms. The reverse transmission mechanism, money supply is influenced by economic activities financed by bank loans and other financial institutions at a certain price (interest rate) and certain conditions (Hartadi, 1997).

Contractive monetary policy will encourage domestic interest rates to increase and the exchange rate will tend to be appreciative. The appreciation of the exchange rate will encourage imports and reduce exports so that the current account balance will deteriorate (Wijoyo and Iskandar, 1999).

The money supply can be optimized by changing the elasticity of the money market to changes in interest rates. In other words, monetary policy will be optimized by implementing a strategy, whereby the money supply and interest rates are set based on a certain relationship (Poole, 1970).

Depreciating the exchange rate of the domestic currency originating from the expansion of money in circulation can increase the aggregate demand for domestic goods through an increase in the price of foreign goods relative to the price of domestic goods. As a result, domestic output increases which can cause money demand to increase and partially relax the downward pressure on domestic interest rates (Batiz and Batiz, 1994; Sutardjo, 2005).

The development of exports with a change in the exchange rate that depreciates, causing exports to be cheaper. A depreciating exchange rate will have an impact on exports (Bronson, 1981).

In the long run, real income or employment rates are basically determined by the supply side, other factors such as welfare policies and other policies determine market flexibility (ECB, 2004). On the other hand, Olivier Blanchard, Chief Economist of the IMF, believes that monetary policy affects the unemployment rate, both actual and natural (Blanchard, 2003).

Peersman and Smets (2001) found that for European countries, the effect of interest rate shocks on output almost doubled during a recession. This shows that monetary policy reaction might be important in understanding unemployment behavior from time to time (Stockhammer and Simon, 2008).

NAIRU (Non-Accelerating Inflation Rate of Unemployment) is defined as the unemployment rate where the inflation condition is stable. This condition is sometimes also referred to as long-term or structural unemployment. If unemployment falls below NAIRU, workers can ask for higher wages, which in turn causes companies to increase the rate of price growth. If inflation rises again it will cause an increase in nominal wage claims and trigger a price-wage spiral (Layard et al, 1991; Carlin and Soskice, 2006).

3.1 Data Types and Sources

The data used in this study are secondary data sourced from Bank Indonesia, the Central Statistics Agency and other relevant sources. The data are annual, quarterly and monthly time series data from 2001 to 2011, consisting of inflation (INF), economic growth rate (GROW), and unemployment rate (UNEMP), balance of payments (BOP).

3.2 Assumption Test

3.2.1 Unit Root Test

This test is intended to determine whether certain coefficients of the autoregressive model have a value of one or not. According to Enders (1995), the need for this test is because ordinary econometric inferences such as ordinary least square (OLS) and vector autoregression (VAR) only apply to stationary data. So if the stationarity test results show that the data series of a

variable is not stationary, then it must be seen the first level difference (first difference). If the first level shows that the condition is not stationary, then proceed to see the difference in the second level, and so on until a stationary condition is obtained. Ultimately, this process will produce a level or order of integration of these variables (Bafadal, 2005).

A series of time series data can be said to be stationary if the mean (μ), variance (σ^2_y)and autovariance (γ_s) are finite. Statistically the variable yt is said to be stationary if it meets the following conditions (Enders, 1995; Bafadal, 2005):

$$E(y_t) = E(y_{t-s}) = \mu \quad (3.1)$$

$$E(y_t - \mu)^2 = E\left[(y_{t-s} - \mu)^2\right] = \sigma^2_y \quad (3.1)$$

$$E\left[(y_t - \mu)(y_{t-s} - \mu)\right] = E\left[(y_{t-s} - \mu)(y_{t-j-s} - \mu)\right] = \gamma_s \quad (3.3)$$

Where: μ, σ^2_y and γ_s

Time series data can be said to be integrated of order k or written with I (k), if after differentiating k times it becomes a stationary series. If the xt series and its first differentiation Δx_t are not stationary, but the second differentiation $\Delta x_t^2 = \Delta x_t - \Delta x_{t-1}$ is stationary then it is said to be integrated of order two, I(2). A series that has never been stationary despite being differentiated several times is called non-integrated.

3.2.2 Cointegration Test

according to Ward (2000), if there is a long-term relationship between two or more non-stationary variables, then the deviation from the long-term trajectory will be stationary. A time series data is said to be integrated of order k or written with I (k), if after differentiating k times it becomes a stationary series.

According to Thomas (1995), there are two types of cointegration testing, namely univariate and multivariate. In the bivariate case, if there is a long-

term relationship between variables, a disequilibrium error will occur and a stationary time series will be formed with a mean equal to zero. In this case ut should be a stationary series without the need to differentiate or I (0) with E (ut) = 0. Thomas (1995) states that there is a unique long-term relationship between two time series xt and yt if: (1) the time series xt and yt are I (1), so that they become stationary with the first differentiation, (2) there are several combinations linear between xt and yt namely I (0) which is stationary. If both of these conditions are met then xt and yt are said to be cointegrated.

In the multivariate case, if there is a single long-term relationship between more than two variables that are integrated of order one, I (1), it means that these variables are cointegrated. If more than one linear combination occurs or more than two variables I (1) are cointegrated, then there may be more than one cointegration vector (Bafadal, 2005). This cointegration test can be carried out with the DF and ADF test. The cointegrated variables show significant values at the 0.01 and 0.05 significance levels.

3.2.3 Determination of Lag Length

Determination of the optimal lag length is an important thing to do in forming the model (Enders, 2004). Determination of the optimal lag in the VAR method becomes very important, because the independent variable used is the lag of the endogenous variable (Hakim, 2003). To determine the optimum lag length, Akaike Information Criterion (AIC), Schawarz Information Criterion (SIC), and Likelihood Ratio (LR) can be used. VAR equation with the smallest AIC, SC and LR values. AIC and SIC are sometimes used instead of R2 so that R2 is not the only indicator of the validity of an econometric model (Thomas, 1997; Greene, 2000). The calculation to obtain the value of AIC, SIC and LR is used the following formula (Alfirman and Sutriono, 2006):

$$AIC(k) = T \ln\left(\frac{SSR(k)}{T}\right) + 2n \quad (3.4)$$

$$SIC(k) = T \ln\left(\frac{SSR(k)}{T}\right) + n \ln(T) \quad (3.5)$$

$$LR = -2(l^r - l^u) \quad (3.6)$$

where, T = number of observations used

k = lag length

SSR = sum of squared residuals

n = number of parameters estimated

l = log likelihood

r = restrictive regression

u = unrecognitive regression

The lag length used can be determined from the smallest number of AIC, SIC and LR among the various lags tested. In the table of the lag length test results using eviews, the smallest value will be marked with a star (*) on the number.

3.3 Data Analysis Methods

3.3.1 Vector Autoregression (VAR) Model

VAR model is suitable to see the effect of a policy is because VAR considers all variables are endogenous. In addition VAR can also estimate identity equality as well as Engel-Granger causality (Thomas, 1997; Gujarati, 1995, Hakim, 2003; Manurung, 2009). In an equation system, there are at least four things to be obtained, namely data description, forecasting, structural inference, and policy analysis. VAR provides analysis tools for these four things through four kinds of uses, namely Forecasting, extrapolating the current and future values of all variables by utilizing all past

information of the variable; Impulse Response Functions (IRF), tracks the current and future responses of each variable due to changes or shock of a particular variable; Forecast Error Decomposition of Variance (FEDVs), prediction of the contribution of the percentage of variance of each variable to changes in a particular variable, and Granger Causality Test, knowing the causal relationship between variables.

Based on the above, the model used in this study is the Vector AutoRegressive (VAR) model, and the Structural Vector Autoregression. Basically this model was developed from a model prepared by Sutarjo (2005).

The specification of the VAR equation model in accordance with the framework developed in Chapter II is as follows:

$$VAR(k), Z_t = A_1 Z_{t-1} + A_2 Z_{t-2} + ... + A_k Z_{t-k} + \varepsilon_t \qquad (3.7)$$

with,

Zt = the time series variable specified,

Ak = nx1 parameter matrix.

K = order or lag

The optimal VAR (k) order is determined based on the Akaike Information Criterion (AIC), Likelihood-Ratio (LR test) and Scwarz Information Criterion (SIC) tests. If k = 2, the specifications of the VAR model in this study are as follows:

$$\begin{aligned} GWM_t = {} & a_{11} OPT_{t-1} + a_{12} GWM_{t-1} + a_{13} RDiskonto_{t-1} + a_{14} rDOM_{t-1} \\ & + a_{15} EXC_{t-1} + a_{16} EXPOR_{t-1} + a_{17} IMPOR_{t-1} + a_{18} INV_{t-1} + a_{1.9} UNEMP_{t-1} \\ & + a_{1.10} BOP_{t-1} + a_{1.11} INF_{t-1} + a_{1.12} GROW \\ & + a_{11} OPT_{t-2} + a_{12} GWM_{t-2} + a_{13} RDiskonto_{t-2} + a_{14} rDOM_{t-2} \\ & + a_{15} EXC_{t-2} + a_{16} EXPOR_{t-2} + a_{17} IMPOR_{t-2} + a_{18} INV_{t-2} + a_{1.9} UNEMP_{t-2} \end{aligned} \qquad (3.8)$$

$$UNEMP_t = a_{11} OPT_{t-1} + a_{12} GWM_{t-1} + a_{13} RDiskonto_{t-1} + a_{14} rDOM_{t-1}$$

$$+ a_{15}EXC_{t-1} + a_{16}EXPOR_{t-1} + a_{17}IMPOR_{t-1} + a_{18}INV_{t-1} + a_{1.9}UNEMP_{t-1}$$
$$+ a_{1.10}BOP_{t-1} + a_{1.11}INF_{t-1} + a_{1.12}GROW$$
$$+ a_{11}OPT_{t-2} + a_{12}GWM_{t-2} + a_{13}RDiskonto_{t-2} + a_{14}rDOM_{t-2}$$
$$+ a_{15}EXC_{t-2} + a_{16}EXPOR_{t-2} + a_{17}IMPOR_{t-2} + a_{18}INV_{t-2} + a_{1.9}UNEMP_{t-2}$$
$$+ a_{1.10}BOP_{t-2} + a_{1.11}INF_{t-2} + a_{1.12}GROW_{t-2} \quad (3.9)$$

$$\mathrm{BOP_t} = a_{11}OPT_{t-1} + a_{12}GWM_{t-1} + a_{13}RDiskonto_{t-1} + a_{14}rDOM_{t-1}$$
$$+ a_{15}EXC_{t-1} + a_{16}EXPOR_{t-1} + a_{17}IMPOR_{t-1} + a_{18}INV_{t-1} + a_{1.9}UNEMP_{t-1}$$
$$+ a_{1.10}BOP_{t-1} + a_{1.11}INF_{t-1} + a_{1.12}GROW$$
$$+ a_{11}OPT_{t-2} + a_{12}GWM_{t-2} + a_{13}RDiskonto_{t-2} + a_{14}rDOM_{t-2}$$
$$+ a_{15}EXC_{t-2} + a_{16}EXPOR_{t-2} + a_{17}IMPOR_{t-2} + a_{18}INV_{t-2} + a_{1.9}UNEMP_{t-2}$$
$$+ a_{1.10}BOP_{t-2} + a_{1.11}INF_{t-2} + a_{1.12}GROW_{t-2} \quad (3.10)$$

$$\mathrm{INF_t} = a_{11}OPT_{t-1} + a_{12}GWM_{t-1} + a_{13}RDiskonto_{t-1} + a_{14}rDOM_{t-1}$$
$$+ a_{15}EXC_{t-1} + a_{16}EXPOR_{t-1} + a_{17}IMPOR_{t-1} + a_{18}INV_{t-1} + a_{1.9}UNEMP_{t-1}$$
$$+ a_{1.10}BOP_{t-1} + a_{1.11}INF_{t-1} + a_{1.12}GROW$$
$$+ a_{11}OPT_{t-2} + a_{12}GWM_{t-2} + a_{13}RDiskonto_{t-2} + a_{14}rDOM_{t-2}$$
$$+ a_{15}EXC_{t-2} + a_{16}EXPOR_{t-2} + a_{17}IMPOR_{t-2} + a_{18}INV_{t-2} + a_{1.9}UNEMP_{t-2}$$
$$+ a_{1.10}BOP_{t-2} + a_{1.11}INF_{t-2} + a_{1.12}GROW_{t-2} \quad (3.11)$$

$$\mathrm{GROW_t} = a_{11}OPT_{t-1} + a_{12}GWM_{t-1} + a_{13}RDiskonto_{t-1} + a_{14}rDOM_{t-1}$$
$$+ a_{15}EXC_{t-1} + a_{16}EXPOR_{t-1} + a_{17}IMPOR_{t-1} + a_{18}INV_{t-1} + a_{1.9}UNEMP_{t-1}$$
$$+ a_{1.10}BOP_{t-1} + a_{1.11}INF_{t-1} + a_{1.12}GROW$$
$$+ a_{11}OPT_{t-2} + a_{12}GWM_{t-2} + a_{13}RDiskonto_{t-2} + a_{14}rDOM_{t-2}$$
$$+ a_{15}EXC_{t-2} + a_{16}EXPOR_{t-2} + a_{17}IMPOR_{t-2} + a_{18}INV_{t-2} + a_{1.9}UNEMP_{t-2}$$
$$+ a_{1.10}BOP_{t-2} + a_{1.11}INF_{t-2} + a_{1.12}GROW_{t-2} \quad (3.12)$$

with:

RR = Statutory Reserves Minimum

INF = Inflation Rate

GROW = Growth

UNEMP = Unemployment

BOP = Balance of Payment

ε_t = random disturbance

3.3.2 Stability VAR Test

A model will be stable if it meets the equation, stability occurs if the polynomial reserve characteristic of the model has no roots in and in the unit circle (all eigenvalues <1). The normality condition in the test data using Jarque BeraTest with N is the number of observations, S and K are the skewness and kurtosis samples respectively. Asymptotic JB statistics on the chi square distribution with two degrees of freedom (degree of fredom) if the data does not meet these two requirements, the package will give a warning and stop the process. However, if both conditions are fulfilled, structural analysis of VAR will be carried out.

3.3.3 Structural Vector Autoregression

The formulation of the VAR model is less theoretical, so the economic interpretation of the VAR model is difficult to define. According to Sims, Breshetto and Voss, SVAR modeling was formulated based on an economic theory framework. In the VAR model all variable deadlines are the determining variables for all time series variables in the model. The formulation of the SVAR model assumes that the number of variables is (n Mt) vector, and ut is the mean of structural innovation equal to zero. Therefore, the SVAR-p model is formulated as follows:

$B[L]M_t = \mu_t$

Where $E[u_t u_t^{'}] = D$, and $E[u_t u_{t+s}^{'}] = 0, s \neq 0$ to $t = -[p-1].....T$. The relationship between VAR and SVAR models can be defined in terms of equations $A[L]M_t = \varepsilon_t$

Where $E[\varepsilon_t \varepsilon_t^{'}] = \Theta,\ E[\varepsilon_t \varepsilon_{t+s}^{'}] = 0 : s \neq 0, [\Gamma] = B_0^{-1} B[\Gamma], and \Theta = [B_0^{-1}] D [B_0^{-1}]$

Perfect identification requires as many parameters in Bo and D $[2n^2 - n]$. If the parameter Θ is $[n^2 + n]/2.$ then as many retributions of B0 $[2n^2 - n]$. $[n^2 + n]/2.$ and diagonals $[n(n-1)]$ are required. The two-step procedure of the ML estimator or the FIML estimator can be used. When model identification is too identified then the two-step procedure of the FIML estimator is inefficient but still consistent. This does not mean that the two-step procedure of the FIML estimator cannot be used, but the results of the estimation are inefficient or tend to be insignificant due to the standard deviation of high or large parameters.

Of the 10 variables of this study, six are exogenous or policy variables, including the LOG variable (RR), while four are endogenous variables namely; LOG (UNEMP), LOG (BOP), LOG (INF) AND LOG (GROW). The structural variance of the covariance matrix (D) is assumed to be diagonal, so the research model can be written as:

$LOG[GWM] = u_2$

3.3.4 Impulse Response Function (IRF) Test and Forecast Error Variance Decomposition (FEVD)

The impulse response function traces the contemporary effects of a shock deviation standard from an innovation to the values of current or future endogenous variables. A shock from an endogenous variable directly affects the variable itself and is also transmitted to other endogenous variables

through the dynamic structure of VAR. Impulse response function (IRF) provides the direction of the relationship and the magnitude of the influence between endogenous variables because it shows the effect of one standard deviation of endogenous shock variables on other endogenous variables and the variable itself (Pindicks and Rubinfeld, 1991). Thus the shock of a variable with the arrival of new information will affect the variable itself and other variables in the system.

Variance Decomposition (FD), or also called Forecast Error Variance Decomposition (FEVD) will provide information about the proportion of the movement of the effect of shock on a variable against other variables in the current period and future periods. FEVD will separate existing variants in endogenous variables into shock components in endogenous variables in VAR (Alfirman and Sutriono, 2005). FEVD is also used to measure the difference between the variants before and after the shock, both the shock that comes from the variable itself and from other variables. For example if there is a shock to a variable, then it can be known what percentage of the change can be explained by the variable itself and what percentage by other variables. Furthermore Sims (1982) states that FEVD shows the strength of Granger causality relationships that might occur between existing variables. If a variable explains a large portion of the FEVD, it can be stated that there is a strong Granger causality relationship between the variables.

3.4 Research Variable

The variables used in this study are explained as follows:

Reserve Requirement (RR), is the Statutory Reserves data obtained from eight percent of the total secondary required statutory reserves and stated in billions of rupiah. Reserve Requirementis a minimum amount of funds that must be maintained by Banks, the amount of which is determined

by Bank Indonesia at a certain percentage of the Bank's Third Party Funds (DPK is a liability of the Bank to residents and non-residents in rupiah and foreign currencies). Reserve Requirement is the minimum amount of funds that must be maintained by banks every day. The reserve requirement is determined by the central bank at a certain percentage of third party funds (DPK). Typically, the reserve requirement is placed in the form of demand deposits at the central bank and still belongs to the bank to be used in non-cash transaction activities and / or fulfillment of intraday customer fund withdrawals (Dela, 2018).

Data was obtained from Bank Indonesia in the quarter from 2000 to 2011.

Inflation Rate (INF), a national inflation rate data obtained from the inflation time series data that occurred in Indonesia on a monthly basis from 2000 to 2011, sourced from Bank Indonesia, in percent units.

Economic Growth (GROW), is the ratio of GDP growth based on constant 2003 prices in the quarter from 2000 to 2011. Obtained from Bank Indonesia and BPS, in billions of rupiah.

Unemployment (UNEM), is a time series data on the number of labor force aged 15 years and over who did not and never worked data taken from 2000 to 2011, obtained from BPS and the Ministry of Labor in thousands of people.

Balance of Payment (BOP), the balance of payment of trade transactions between Indonesia and other countries in the world, is stated in billions of rupiah. The data are time series data from Bank Indonesia in the quarters from 2000 to 2011.

CHAPTER IV
DEVELOPMENT OF MONETARY POLICY INSTRUMENTS AND MACRO INDICATORS IN INDONESIA

The monetary instruments used in this study are the statutory reserve requirement (RR), and the interest rate of Bank Indonesia Certificate Interest Rate, this intermediate variable is also an independent variable that will shock the dependent variable. Even though the shock of the intermediate variable is not the main goal, it will later influence the independent variable. Next is the dependent variable or the dependent variable, is; unemployment rate (UNEMP), balance of payments (BOP), inflation rate (INF) and growth rate (GROW).

The following will be explained briefly how the development of the variables used in this study.

a. Development of Statutory Reserves in Indonesia

Reserve Requirement (RR) or also called reserve requirements are funds that must be deposited by banks in the form of demand deposits at Bank Indonesia. The obligation in this reserve requirement will affect the amount of liquidity available at commercial banks. RR is an instrument that is less flexible because it cannot be changed at any time both in terms of volume, time period and the amount of funds absorbed. The reserve requirement value is usually determined as a certain percentage of the funds held by the public in the bank (third party funds), so that the amount of funds absorbed is sometimes not as needed. This is in accordance with the provisions in Law No. 10 of 1998 which states that banks are business entities that collect funds from the public in the form of deposits and distribute them to the public in the form of credit or other forms in order to improve the lives of many people. A general term that can describe a bank's activities is "borrows short and lends

long", that is, banks get funds from short-term deposits to lend in the longer term.

In accordance with Bank Indonesia regulation number: 12/19 / PBI / 2010 concerning the Statutory Reserves for Commercial Banks in Rupiahs and foreign currencies, that the Statutory Reserves consist of primary Statutory Reserves, secondary Statutory Reserves and LDR Statutory Reserves.

Fulfillment of Statutory Reserves in rupiahs as referred to in Article 2 paragraph (2) is determined as follows: (a) Primary Statutory Reserves in rupiahs of 8% (eight percent) of DPK in rupiahs, (b) Secondary Statutory Statements in rupiahs of 2.5% (two) point five percent) of DPK in rupiah, (c) GWM LDR in rupiah amounting to the calculation between the Lower Disincentive Parameter or the Upper Disincentive Parameter and the difference between the Bank's LDR and the Target LDR by taking into account the difference between the Bank's KPMM and the Incentive KPMM. The reserve requirement data in this study is proxy from the primary reserve requirement, which represents 8 percent of third party funds (DPK). Third Party Funds are obligations of the Bank to residents and non-residents in rupiah and foreign currencies. The following is the reserve requirement data for 2000-2011.

Table 4.1 Development of Reserve Requirement (RR / Billion Rupiah) in 2000-2011

Year	Kwartal I	Kwartal II	Kwartal III	Kwartal IV	Rata/Thn	RR Development
2000	52.345,04	53.318,48	54.058,08	55.988,80	215.710,40	0,00
2001	56.205,36	60.382,00	62.480,24	63.788,96	242.856,56	0,11
2002	64.462,08	65.365,28	65.672,16	66.862,24	262.361,76	0,07
2003	66.672,88	134.791,12	137.275,52	141.435,68	480.175,20	0,45

2004	140.927,28	214.464,80	175.347,92	225.889,76	756.629,76	0,37
2005	228.651,84	238.108,88	82.594,08	212.641,12	761.995,92	0,01
2006	269.099,76	196.428,24	198.023,04	301.736,80	965.287,84	0,21
2007	308.400,00	316.871,44	221.750,32	349.493,36	1.196.515,12	0,19
2008	376.784,56	363.348,64	373.156,64	398.766,40	1.512.056,24	0,21
2009	423.061,04	431.069,84	440.872,80	365.818,96	1.660.822,64	0,09
2010	469.016,00	407.176,16	505.555,04	361.016,64	1.742.763,84	0,05
2011	386.825,44	574.032,33	597.347,44	206.982,56	1.765.187,77	0,01

Graphically the growth trend of the reserve requirement value is shown in Figure 4.1.

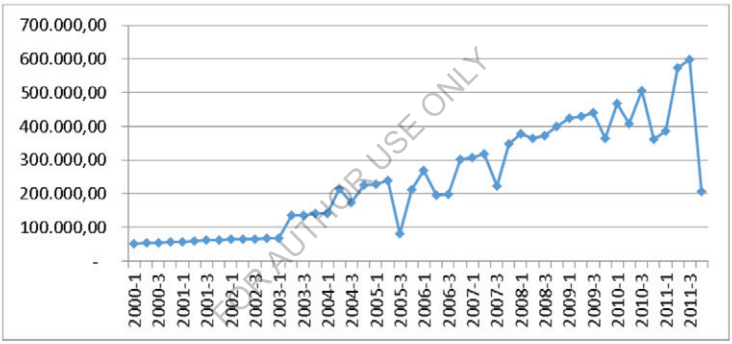


Figure 4.1 Development of Reserve Requirement for the period 2000 – 2011

From Figure 4.1 it can be seen how the trend in the development of Reserve Requirement, overall the value of the reserve requirement from 2000-2011 shows an increasing trend. The increase slowly occurred in 2000-2003 the value was still below 100 billion rupiah. But in the second quarter of 2003 there was a significant increase of around 102.17% from the first quarter of 2003. From the data it can be seen that the government wants to reduce the money supply in the community. Increasing the reserve requirement means that the obligations of commercial banks are increasing. There are several consequences of this action, starting from the decrease in the money supply,

resulting in an increase in interest rates so that investment is reduced. After that the trend shows the number of Statutory Reserves continues to increase, although sometimes it decreases but the decline is still expected in the average. The largest reserve requirement occurred in 2011 in the third quarter, but after that it dropped dramatically in the fourth quarter, down by around 188, 60% from the third quarter of 2011. The increase in commercial bank liabilities means that it will add to the amount of liquidity that can later be lent again to banks- commercial banks.

b. The Development of Unemployment in the Period of 2000 - 2011 in Indonesia

The next variable is the amount of unemployment in Indonesia. The unemployment data in the study is open unemployment data, ie people aged 15 years and over who have worked and have never worked. Table 4.2 shows the development of unemployment in 2000-2011, while the trend can be seen in Figure 4.2.

Table 4.2. Development of Unemployment in the Period of 2000-2011 (people)

Year	Kwartal I	Kwartal II	Kwartal III	Kwartal IV	Total	Unemployment Development
2000	1868191	1905837	1943844	1982214	7700086	0
2001	2020944	2060037	2099491	2139307	8319779	0,07
2002	2188628	2225509	2259095	2289385	8962617	0,07
2003	2300922	2330802	2363569	2399222	9394515	0,05
2004	2433093	2476385	2524432	2577232	10011142	0,06
2005	2685678	2727628	2753975	2764719	10932000	0,08
2006	2741366	2728301	2707031	2677555	10854254	-0,01
2007	2623944	2584429	2543080	2499898	10251351	-0,06

2008	2437747	2397751	2362774	2332818	9531090	-0,08
2009	2348872	2312559	2264870	2205804	9132104	-0,04
2010	2148512	2061433	1957719	1837367	8005031	-0,14
2011	1700380	1546756	1376496	1189599	5813231	-0,38

Figure 4.2. The Development of Unemployment in the Period of 2000-2011.

Unemployment is a macroeconomic indicator. The higher unemployment means the economy is getting worse. The high unemployment rate is one of the obstacles for a country's growth. In the first quarter of 2000 the number of unemployed people in Indonesia reached 1868191 people, then the number of unemployed people increased to 1905837 in the second quarter of 2000, so that finally the total number of unemployed in 2000 was 77,00086 people, this number still increased in 2001 to 8319779 people, an increase in the number This unemployment continued to occur until 2007 in the amount of 10251351 people.

This is in line with investment growth that continued to decline until 2006. Investment as one of the factors absorbing labor, is expected to grow, lack of stimulation of investment in 2000-2006 resulting in reduced employment. The number of workers decreases when the amount of investment starts to increase. The decline in the number of workers began in 2007 until the end of the research period in 2011. The decline in the number of unemployed continued to occur, though slowly. Improved economic conditions have led to increased employment.

In addition to investment, education level is also a factor causing the high number of unemployed people in Indonesia. Because education will improve the quality of human resources. The still low level of education of the Indonesian people in general results in many job seekers who do not have the expertise required by the developing industry, eventually there are still many companies, especially foreign companies, which take many workers

from outside. In addition, there are many discrepancies about the expertise needed between job seekers and companies that need workers.

Total population growth that is growing rapidly and not followed by investment growth adds to the number of unemployed increasing rapidly not in accordance with the normal ratio. All these factors accumulated so that the number of unemployed became rapidly developing until 2007. But the government efforts finally paid off as well, after 2007 there was a decrease in the number of unemployed, although only 0.06% from 2006, but this is one indicator of the improving economic conditions Indonesia. This decline continued until the research period of 2011.

c. Development of Balance of Payments (Balance of Payment / BOP) for the Period of 2000 - 2011 in Indonesia

Balance of payments is one of the macro indicators in Indonesia. Balance of payments is an overview that contains all national and international economic transactions of a country, all of these transactions will be recorded, collected and arranged in an overview. Table 4.3 development of Indonesia's balance of payments for the period 2000-2011, while the trend can be seen in Figure 4.3

Table 4.3 Development of the Balance of Payments (Balance of Payment / BOP) for the Period of 2000-2011 (million USD)

Year	Kwartal I	Kwartal II	Kwartal III	Kwartal IV	Total	BOP Development
2000	2808.00	370.00	563.00	1300.00	5041.00	0
2001	941.00	319.00	-35.00	-721.00	504.00	-9,00
2002	233.00	1223.00	1356.00	2216.00	5028.00	0,90
2003	233.00	1223.00	1356.00	2216.00	3655.00	-0,38

2004	1357.00	-1915.00	11.00	860.00	313.00	-10,68
2005	352.00	-1480.00	-3169.00	4741.60	444.60	0,30
2006	5786.00	3379.00	2637.00	2708.65	14510.65	0,97
2007	4379.00	3637.00	1179.00	3520.23	12715.23	-0,14
2008	1032.00	1324.00	-89.00	-4212.12	-1945.12	7,54
2009	3955.00	1052.00	3546.00	3953.69	12506.69	1,16
2010	6621.00	5421.00	6955.00	11288.92	30285.92	0,59
2011	7666.00	11876.00	-3960.00	-3726.00	11856.00	-1,55

Graphically the development of the balance of payments in Indonesia in the period 2000-2011 can be seen in the graph Figure 4.3.

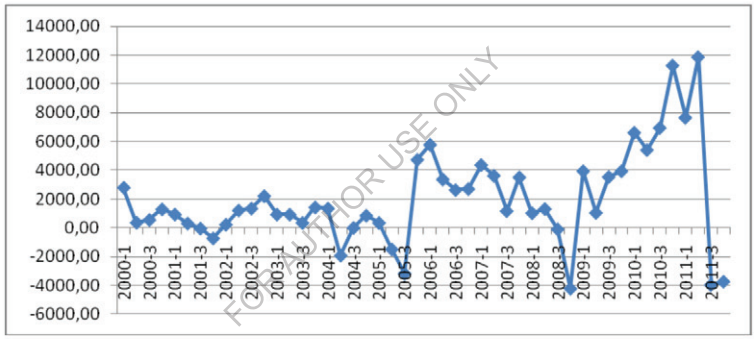


Figure 4.3 Development of the Balance of Payments (Balance of Payment / BOP) in 2000-2011

This balance of payment data consists of the trade balance, the service balance and transfer payment) and the capital and financial traffic balance, and financial items.

Transactions in the balance of payments can be divided into two types, namely:

1. Debit transactions, namely transactions that cause the flow of money (foreign exchange) from domestic to foreign countries. This

transaction is called a negative transaction (-), which is a transaction that causes a reduction in the position of foreign exchange reserves.

2. Credit transactions are transactions that cause the flow of money (foreign exchange) from abroad into the country. This transaction is also called a positive (+) transaction, which is a transaction that causes an increase in the country's foreign exchange reserves.

From the data it can be seen that a positive value is the majority value of a negative value, meaning that more foreign flows enter than internal flows flowing abroad, which means an increase in foreign exchange from transactions carried out in the period 2000-2011.

In 2000 there was an increase in foreign exchange amounting to 5041 million USD, meaning that of all transactions carried out in 2000 with foreign residents succeeded in adding foreign exchange amounting to 5041 million USD, then in 2002 there was a significant decrease to 504 million USD meaning a decrease of 90%, from 2000, this was due in quarter 3 and quarter 4 of 2001 the value of the balance of payments was minus, as a result the total value of the balance of payments dropped from the previous period. This condition did not last long, in 2003 the position of the balance of payments has increased again to 5028 million USD, a significant increase compared to 2002. Furthermore, the balance of payments decreased steadily until 2005, as well as the amount is still positive, so that it can still generate foreign exchange from transactions that are occurred despite a decline. If related to the number of exports and imports in the same period, this shows that the value of exports is greater than imports.

In 2006 and 2007 the balance of payments experienced a very rapid growth from 444.60 million US dollars in 2005 to 14510.65 million US dollars, an increase of 3163%. This increase occurred the most in the first quarter of 2006, then in 2007 it decreased to 12715.23 million US dollars. A

very drastic decrease occurred in 2008, the balance of payments deficit of -1945.12 million US dollars. But after that the balance of payments experienced a significant growth back in 2009, amounting to 12506.69 million US Dollars, 30285.92 million US Dollars in 2010, and again declined even though there was no deficit to 11856 million US Dollars.

From the data it can be seen that the value of the balance of payments is very volatile, often with extraordinary growth, but has also experienced a drastic decline. This is caused by many things including domestic interest rates and international interest rates, national income and inflation. So these three variables can influence each other.

d. Development of Inflation Period 2000 - 2011 in Indonesia

Inflation is strongly associated with a decrease in purchasing power, both individuals and companies. One very important event that is found in almost all countries in the world is inflation. In the economy there are certain forces that cause the price level to surge all at once, but there are other forces that cause the price level to rise continuously slowly. Events that tend to drive up prices are called volatile inflation (Lipsey, 1992).

Table 4.4 Development of Inflation Rate for the Period 2000-2001 (percent)

Year	Kwartal I	Kwartal II	Kwartal III	Kwartal IV	Average	Development of Inflation
2000	1.10	2.10	6.80	9.40	4.85	0
2001	10.60	12.10	13.00	12.60	12.075	0,60
2002	14.10	11.50	10.10	10.00	11.425	-0,06
2003	7.10	6.60	6.20	5.10	6.25	-0,83
2004	5.10	6.80	6.30	6.40	6.15	-0,02
2005	8.80	7.80	9.10	17.10	10.7	0,43
2006	17.90	15.50	9.10	6.60	12.275	0,13
2007	6.50	5.80	7.00	6.60	6.475	-0,90

2008	8.17	11.03	12.14	11.06	10.6	0,39
2009	7.92	3.65	2.83	2.78	4.295	-1,47
2010	3.43	5.05	5.67	6.96	5.2775	1,00
2011	6.65	5.54	4.61	4.67	5.3675	0,02

Graphically the development of inflation in Indonesia can be seen in Figure 4.4.

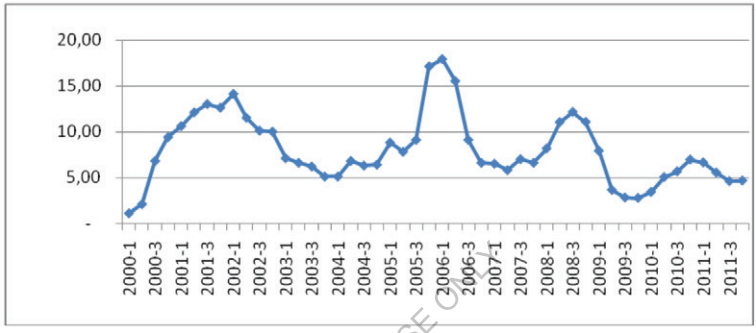


Figure 4.4 Developments in Inflation Rates for the Period 2000 - 2001 (percent)

From the overall data it can be seen that inflation in Indonesia is mostly classified as mild inflation (less than 10% / year), there are only three years of moderate inflation (between 10% to 30% / year), which occurred in 2001, 2002 and 2006. The significant increase in inflation from 2000 was only 4.85% to 12.75% in 2001 due to the inflation that occurred in Q3 / 2001 was quite large at 13%. If it is related to the cause of inflation in the same year from the variables that were examined in this study the exchange rate is the variable that most closely affects the inflation rate in Indonesia.

In the same year, namely 2001, the exchange rate of the rupiah against the dollar also weakened compared to 2000 in the first quarter of 2000 the exchange rate of the rupiah against the dollar amounted to 7506.67 rupiahs while in the first quarter of 2001 the exchange rate weakened to 9,895 rupiah

per one dollar. The higher inflation rate was also exacerbated by the weakening of the rupiah against the dollar in subsequent periods. For example in the second quarter of 2000 the exchange rate of the rupiah against the dollar was 8433.33 rupiah per one dollar, while in the second quarter of 2001 it weakened to 11,391 rupiah per one dollar. The weakening condition of the rupiah has led to an increase in imports, because the price of goods abroad is cheaper than domestic products. Limited domestic products cause the price of domestic goods to be expensive. To overcome this problem the government made several adjustments several times, this can be seen from the symptoms of depreciation of 4% - 5% per year.

Besides the exchange rate, the inflation rate can also be influenced by the money supply and government spending. If the amount of money circulating is much this will stimulate an increase in inflation, this is because domestic demand for goods will increase, but not followed by the amount of production, as a result of rising domestic product prices, then to cover the lack of domestic demand, import is done, let alone it turns out the price of imported goods is cheaper, this further aggravates the rate of inflation in Indonesia.

This is in line with government spending, if government spending is greater the inflation rate will also increase. Systematic efforts are needed to overcome this problem, so that the objectives can be achieved. But at the end of the research period, from 2009 to 2011 the inflation rate is getting lower, only at about 5%. This shows that economic conditions in Indonesia have improved.

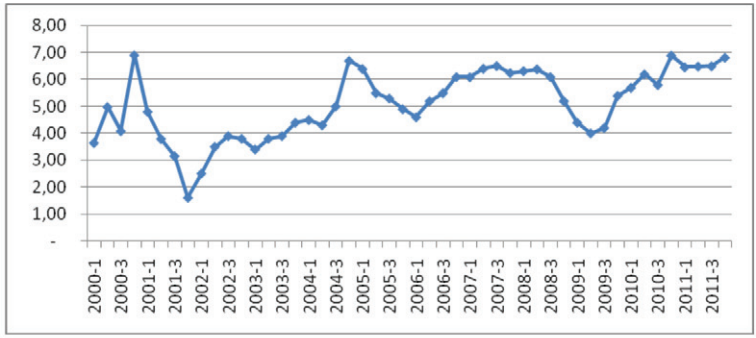
e. Development of Economic Growth in 2000 - 2011

The last variable that will be described is the macro indicator which is the main objective, namely the level of national economic growth. The rate of economic growth in Indonesia is obtained from:% Furthermore, the value of

national economic growth is expressed as a percent. GDP is the amount of national output based on constant 2003 prices in the quarter from 2000 to 2011. Table 4.5 shows data on the development of the national growth rate from 2000-2011, while the trend can be seen from Figure 4.5.

Table 4.5. Development of the National Economic Growth Rate Year 2000-2011

Year	Kwartal 1	Kwartal 2	Kwartal 3	Kwartal 4	Average	Economic Growth Development
2000	3.64	4.98	4.08	6.91	4.90	0
2001	4.80	3.79	3.15	1.60	3.34	-0,47
2002	2.50	3.50	3.90	3.80	3.43	0,03
2003	3.40	3.80	3.90	4.40	3.88	0,12
2004	4.50	4.30	5.00	6.70	5.13	0,24
2005	6.40	5.50	5.30	4.90	5.53	0,07
2006	4.60	5.20	5.50	6.10	5.35	-0,03
2007	6.09	6.41	6.51	6.25	6.32	0,15
2008	6.32	6.39	6.10	5.20	6.00	-0,05
2009	4.40	4.00	4.20	5.40	4.50	-0,33
2010	5.70	6.20	5.80	6.90	6.15	0,27
2011	6.46	6.49	6.50	6.82	6.57	0,06



Picture. 4.5. Development of National Economic Growth Rates 2000-2011.

The level of national economic growth has also fluctuated like other macro variables. Because all of these variables do influence each other. After the economic crisis in the first quarter of 2000 the economic growth rate was 3.64%, subsequently increased by 4.98%, 4.08% and increased again to 4.90%. The increase seems to be slowly but nevertheless it continues to increase.

4.1 Analysis of Research Results (Estimated Results)

4.1.1 Unit Root Test

To see whether a series of data is stationary or not, it can be tested with a unit root test. Non-stationary data can cause spurious regression, which is a regression that describes the relationship of two or more variables that appear to be statistically significant when in reality it is not. The stationary data on each variable can be seen with the Augmented Dickey Fuller (ADF) test.

Based on Table 4.6 it can be explained that almost all variable data are not stationary at the level of level, because the statistical value is smaller than Mc Kinnon's critical values, such as the GWM and GROW variables. While some other variables have shown significant value because the Augmented

Dickey Fuller value is statistically greater than Mc.Kinnon's critical value at 1 percent confidence level, such as some UNEMP and BOP shows stationary conditions. The solution that can be done to overcome this unstability problem is to create a new variable by means of the first difference, then the ADF test is performed again.

Table 4.6 Results of Unit Root Testing at Level Level

No	Variable	Value ADF	Critical Value *)	Probability	Conclusion
2	RR	-1,885709	-3,577723	0,3360	Not stationary
7	UNEMP	-4,801618	-3,577723	0,0003	Stationary
8	BOP	-3,758513	-3,577723	0,0062	Stationary
9	INF	-2,474209	-3,577723	0,1281	Not stationary
10	GROW	-2,26451	-3,577723	0,1874	Not stationary

Source: Data processed with Eviews 6; *) Mc.Kinnon's Critical Value at the Significance level of 1%.

Table 4.7 Unit Root Test Results at the First Difference Level

No	Variable	Score ADF	Critical Value *)	Probability	Conclusion
1	GWM	-8,402720	-3,58112	0,0000	Stasioner
2	GROW	-7,727681	--3,58112	0,0000	Stasioner

Source: Data processed with Eviews 6; *) Mc.Kinnon's Critical Value At the Significance level of 1%.

The data table above still shows some problems. Because it turns out there are still some variables that are not stationary. To avoid spurious regression, it can be done by creating new variables by forming variables at

the second difference level, then the ADF test is performed again. The result is as follows.

4.1.2 Cointegration Test

Cointegration Test is the next step after conducting a stationary test. This test is carried out for non-stationary data at the level level, which means that there is an indication of a long-term relationship between variables. To prove the long-term cointegration, cointegration test is needed. Cointegration test results with the Eviews 6 tool can be seen from Table 4.8.

Table 4.8 Johansen's Cointegration Test

Date: 01/06/14 Time: 12:43

Sample (adjusted): 2000Q3 2011Q4

Included observations: 46 after adjustments

Trend assumption: Linear deterministic trend

Series: OPT GWM RDISKONTO RDOM EXC EXPOR IMP INV UNEMP BOP INF GROW

Lags interval (in first differences): 1 to 1

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.953491	606.4975	334.9837	0.0000
At most 1 *	0.917215	465.3646	285.1425	0.0000
At most 2 *	0.817798	350.7553	239.2354	0.0000
At most 3 *	0.768457	272.4339	197.3709	0.0000
At most 4 *	0.701350	205.1364	159.5297	0.0000

At most 5 *	0.593439	149.5462	125.6154	0.0008
At most 6 *	0.552097	108.1452	95.75366	0.0053
At most 7 *	0.441036	71.19907	69.81889	0.0387
At most 8	0.392828	44.44227	47.85613	0.1010
At most 9	0.257384	21.49089	29.79707	0.3277
At most 10	0.154493	7.802401	15.49471	0.4868
At most 11	0.001797	0.082729	3.841466	0.7736

Trace test indicates 8 cointegrating eqn(s) at the 0.05 level

* denotes rejection of the hypothesis at the 0.05 level

**MacKinnon-Haug-Michelis (1999) p-values

Based on Table 4.8, it can be explained that there are 8 equations integrated at the 5 percent level.

4.1.3 Determination of Lag Length

To determine the length of the lag that will be used in the regression equation, some information can be used, namely by using the Akaike Information Criterion (AIC), Schwarz Criterion (SC) and Human-Quinn Criterion (HQ) and the smallest value between the optimal lag is selected. AIC values and SIC for each lag is shown in Table 4.9.

Tabel 4.9 Determination of Lag Length

Lag	LogL	LR	FPE	AIC	SC	HQ
0	43.56159	NA	4.12e-16	-1.372243	-0.895206	-8.818594
1	549.0601	725.2804	7.43e-23	-17.08957	-10.88809*	-14.76646
2	777.1239	208.2322*	7.67e-24*	-20.74452*	-8.818594	-16.27699*

Source: Data processed with Eviews 6

Table 4.9 shows that for the Akaike Information Criterion (AIC) criteria the smallest value is in lag2, for the Schwarz Criterion (SC) criterion the smallest value is in lag 1, and for the Human-Quinn Criterion (HQ) criteria the smallest value is in criterion 2.

4.1.4 Stability VAR Test

Before entering into further stages of analysis, the estimated results of the VAR equation system that have been formed need to be tested for stability through the VAR stability condition check in the form of roots of characteristic polynomial to all variables used multiplied by the number of lags of each VAR. If the modulus of all Ar-roots values is below 1, the VAR system is considered stable. VAR stability test in this study can be seen in Table 5.6. This table can explain that all unit roots of the stability test results of the VAR estimation have a modulus smaller than 1. Then the VAR estimate that meets the stability condition is the VAR estimation using lag 2.

4.2 Analysis Model

4.2.1 Structural Vector Autoregression (SVAR)

The formulation of the VAR model is generally based on the identification of endogenous and exogenous variables that are less clear, so that all transmit variables are co-integrated. Therefore the VAR model is not based on economic concepts so the economic interpretation of the results of the VAR estimation model is difficult to define, but the SVAR model is based on economic theories or concepts. Before formulating the SVAR, the VAR model is first estimated, the next step is to formulate and estimate the SVAR from random shocks or structural innovations of the VAR model, namely the shock of monetary policy instruments. The monetary instrument shock studied was, open market operating instrument shock (ε OPT), minimum

required giro shock (ε GWM), exchange rate (ε EXC), Export (ε EXPOR), Import (ε IMP), and Investment (ε INV), while the final target is the amount of unemployment (ε UNEMP), balance of payments (ε BOP), inflation (ε INF), and growth rate (ε GROW).

1. Unemployment Shock (UNEMP)

Reserve Requirement Shock

Reserve Requirement Shock has a positive effect on the number of unemployed at 0.013816 (C2). This means that if the shock of reserve requirement increases by 1 billion rupiah, it will cause shock to unemployment to increase by 0.013816 percent. The reserve requirement variable will not directly affect the variable unemployment, there must be an intermediate variable that connects it. The minimum statutory reserve, is a monetary instrument that can also be controlled directly by the central bank. From the theory it is stated that if the central bank instructs to increase the amount of reserve requirement to commercial banks, this means it will reduce the existing reserves in commercial banks, so that the money supply will decrease, the interest rates of commercial banks will increase, this results in investors postpone their credit loan plans, consequently investment has not increased. The absorption of labor that is expected to originate from opening new industries or developing from previous industries did not occur, eventually unemployment also increased with the increase in labor. This means that in accordance with the results of research which states that the shock reserve requirement has a positive effect on shock unemployment, meaning that if the shock the reserve requirement increases this will result in the number of unemployed also increasing.

2. Balance of Payment Shock (Balance of Payment / BOP)

Reserve Requirement Shock

Reserve Requirement Shock had a negative effect on the balance of payments balance (BOP) of 0.45 (C10). This means that the shock value of reserve requirement increases by 1 billion rupiah will cause the shock of BOP to decrease by 0.45 percent. And the probability value of 0.002 <0.01

b. Unemployment Shock / Unemp

Shock Unemp has a negative effect on the balance of payment balance (BOP) of 3.30 (C17). This means that the shock value of Unemp will increase by 1 billion rupiah, and the BOP shock will decrease by 3.30 percent. And the probability value is 0.00 <0.01. This means that unemployment shock does not significantly influence BOP shock.

3. Shock Inflation (Inflation / INF)

Reserve Requirement Shock

Reserve Requirement Shock had a negative effect on the inflation rate of 0.14 (C19). This means that if the shock the reserve requirement increased by 1 billion rupiahs would cause shock inflation decreased by 0.14 percent. And the probability value of 0.401> 0.01, meaning that the shock the reserve requirement was not significant effect on INF shock.

Unemployment Shock / Unemp

Unemployment Shock / Unemp has a positive effect on the inflation rate of 2.27 (C26). This means that if Unemp's shock rises by 1 billion rupiah, it will cause inflation shock to increase by 2.27 percent. And the probability value of 0.0000 <0.01, meaning that unemployment shock has a significant effect on INF shock.

Balance of Payments Shock (BOP)

Balance of Payments Shock (BOP) has a positive effect on the inflation rate of 0.31 (C27). This means that if the BOP shock increases by 1 billion rupiahs it will cause shock Inflation increases by 0.31 percent. And the

probability value of 0.035> 0.01, meaning that the BOP shock has no significant effect on the INF shock.

4. Growth Shock (Growth / Grow)

Reserve Requirement Shock

Reserve Requirement Shock has a negative effect on the growth rate of 1.69 (C29). This means that if the reserve requirement shock increases by 1 billion rupiahs it will cause shock to decrease growth by 1.69 percent. And the probability value of 0,000 <0.01 means that the shock reserve requirement has a significant effect on shock GROW.

Unemployment Shock / Unemp

Unemp Shock has a positive effect on the growth rate of 2.09 (C36). This means that if Unemp's shock increases by 1 billion rupiah, it will cause growth shock to increase by 2.09 percent. And the probability value of 0,0006 <0.01, means that unemployment shock has a significant effect on shock GROW

Balance of Payment Shock (BOP)

BOP Shock has a positive effect on the growth rate of 0.13 (C37). This means that if the shock of BOP increases by 1 billion rupiah, it will cause shock to increase growth by 0.13 percent. And the probability value is 0.411> 0.01, meaning that the BOP shock does not significantly influence the GROW shock

Shock Inflation (Inflation / INF)

INF Shock has a negative effect on the growth rate of 0.14. This means that if the INF shock increases by 1 billion rupiah, it will cause the growth shock to decrease by 0.14 percent. And the probability value is 0.312> 0.01, meaning that the inflation shock does not significantly influence the GR shock.

4.2.2 Impulse Response Function (IRF)

The SVAR model estimation results can be used for the analysis of the response function towards the balance path and the accumulation of response functions toward the balance path and the proportion of variance. This analysis is known as the Impulse response function (IRF) analysis, used to see the effect of changing one standard deviation of a variable against the variable itself or other variebel. Impulse response function (IRF) analysis is divided into three periods, namely the short-term period of 1-5 years, the medium term of 6-10 years and the long-term of more than 10 years. The existence of a shock (shock) causes fluctuations in each variable. IRF analysis is carried out using 20 periods of observation using the Structural Decomposition method where the shocks consist of minimum statutory reserves (GWM), Unemployment (Unemp), Balance of Payments (BOP), Infection (Inf) and Growth (Grow). The four macro indicators which are the final target of the economy will be given shock by all research variables, including the macro indicators themselves. Following are the results of the accumulation of responses from macroeconomic indicators consisting of the variables unemployment (Unemp), Balance of Payments (BOP), Inflation (Inf) and Growth (Grow).

1. Impulse Response Function Unemployment (Unemp)

The results of the analysis of the accumulation of Unemp's response to the shock of all variables. And in brief how the response of the unemployment variable due to shock from its endogenous variables can be seen in Table 4.10

Table 4.10. Summary of Impulse Response Function Unemployment Results

No	Variable	Short-term	Medium-term	Long-term
1	ε RR	-	+	-
2	ε Unemp	+	+	+
3	ε BOP	+	-	-

4	ε INF	+	+	+
5	ε GROW	+	+	-

2. Impulse Response Function Balance of Payment

The analysis of the function of the accumulation of BOP responses to shock from all variables. And in brief how the response of the balance of payment variables due to shock from endogenous variables can be seen in Table 4.11.

Table 4.11 Summary of Results of Impulse Response Function Balance of Payments

No	Variable	Short-term	Medium-term	Long-term
1	ε RR	-	-	-
2	ε Unemp	-	-	+
3	ε BOP	+	+	+
4	ε INF	+	+	+
5	ε GROW	+	+	+

3. Impulse Response Function Inflation (INF)

The results of the analysis of the function of the accumulation of BOP responses to shock from all variables. And in brief how the response of the inflation variable due to shock from its endogenous variables can be seen in Table 4.12.

Table 4.12. Summary of Impulse Response Function Inflation Results

No	Variable	Short-term	Medium-term	Long-term
1	ε GWM	-	+	-
2	ε Unemp	+	+	+
3	ε BOP	+	+	-
4	ε INF	+	-	+

5	ε GROW	+	+	+

And in brief how the response of the growth variable (GROW) due to shock from its endogenous variables can be seen in Table 4.13

Table 4.13 Summary of Results of Impulse Response Function Growth

No	Variable	Short-term	Medium-term	Long-term
1	ε RR	-	+	-
2	ε Unemp	-	+	+
3	ε BOP	+	+	-
4	ε INF	-	+	+
5	ε GROW	+	-	-

CHAPTER V
THE EFFECT OF RESERVE REQUIREMENT ON ECONOMIC GROWTH, INFLATION, BALANCE OF PAYMENTS AND UNEMPLOYMENT RATE IN 2000-2011 IN INDONESIA

5.1 Unit Root Tests (Stationary Tests)

Stationary testing is one of the important topics in time series data. This stationarity is to ensure that there is no problem for further data processing procedures. According to Enders (1995), the need for this test is because ordinary econometric inferences such as ordinary least square (OLS) and vector autoregression (VAR) only apply to stationary data. So if the stationarity test results show that the data series of a variable is not stationary, then it must be seen the first level difference (first difference). If the first level shows that the condition is not stationary, then proceed to see the difference in the second level, and so on until a stationary condition is obtained. Ultimately, this process will produce a level or order of integration of these variables (Bafadal, 2005).

Based on Table 4.2 it can be explained that almost all variable data are not stationary at the level of level, because the statistical value is smaller than Mc Kinnon's critical values, such as RR and GROW variables. While some other variables have shown significant value because the Augmented Dickey Fuller value is statistically greater than Mc.Kinnon's critical value at 1 percent confidence level, such as the exchange rate variable (EXC), unemployment (UNEMP) and balance of payments (BOP) shows that conditions are stationary.

The solution that can be done to overcome this unstability problem is to create a new variable by first difference, then the ADF test again. The degree of integration test is a continuation of the unit root test. This test is carried out as a consequence of the failure to fulfill stationary assumptions at degree I (0). In this test, the data is defined to a certain degree, until all data become stationary to the same degree. Enders (1996), Hakim (2003) states that in operating the VAR method it is not recommended to use the first derivative form. Because the use of first-derived data can eliminate important information about the relationship of variables in a system such as the possibility of cointegration relationships. Therefore, this study will not use the first derivative in operating the VAR method.

5.2 Cointegration Test

There are 8 cointegrated equations at the 5 percent level, indicated by these eight equations having a probability value smaller than 0.05. means there is a long-term relationship between variables. So all variables are stated to have a long-term contribution, so the Vector Autoregression analysis can be used for further testing.

5.3 Determination of Lag Length

Determination of the lag length is done by the Akaike Information Criterion (AIC), Schwarz Criterion (SC) and Human-Quinn Criterion (HQ) tests on the base lag or lag 0 AIC value of -1.372243, at lag 1 of -17.08957, and at lag 2 of -20.74452 *, so it says lag 2 which is better than lag 1, because the value of lag 2 is smaller than the value of lag 1. When viewed from the value of Schwarz Criterion (SC) on the base lag or lag 0 the SC value is -0.895206, on lag 1 in the amount of -10.88809 *, and in lag 2 in the amount of -8.818594, based on the SC criteria the smallest value is in lag 1. There are

still further criteria namely the Human-Quinn Criterion (HQ) criteria on this criterion at the base value or lag0 of -8.818594 , in lag 1 of -14.76646 and in lag 2 of - -16,27699 * so that the smallest value is shown in lag 2. Of the three criteria, it shows that there are 2 criteria that suggest using lag 2 and one criterion suggests using lag 1, so that a can be concluded that the lag used is lag 2. this study will further use lag 2.

5.4 Structural Vector Autoregression (SVAR)

1. Unemployment Shock (UNEMP)

Reserve Requirement Shock

Reserve Requirement has a positive effect on the number of unemployed at 0.013816 (C2). This means that if the shock of reserve requirement increases by 1 billion rupiah, it will cause shock to unemployment to increase by 0.013816 percent. The reserve requirement variable will not directly affect the variable unemployment, there must be an intermediate variable that connects it. The minimum statutory reserve, is a monetary instrument that can also be controlled directly by the central bank. From the theory it is stated that if the central bank instructs to increase the amount of reserve requirement to commercial banks, this means it will reduce the existing reserves in commercial banks, so that the money supply will decrease, the interest rates of commercial banks will increase, this results in investors postpone their credit loan plans, consequently investment has not increased. The absorption of labor that is expected to originate from opening new industries or developing from previous industries did not occur, eventually unemployment also increased with the increase in labor. This means that in accordance with the results of research which states that the shock reserve requirement has a positive effect on shock unemployment, meaning that if the shock the reserve

requirement increases this will result in the number of unemployed also increasing.

Judging from the estimated probability obtained by the probability value of 0.92> 0.01, meaning that the shock reserve requirement does not significantly influence the unemployment shock at the 0.01% confidence level and in the study period 2000-2011.

2. Balance of Payment Shock (BOP)

Reserve Requirement Shock

Reserve Requirement Shock has a negative effect on the balance of payments balance (BOP) of 0.45 (C10). This means that the shock value of reserve requirement increases by 1 billion rupiah will cause the shock of BOP to decrease by 0.45 percent. And the probability value of 0.002 <0.01.

Unemployment Shock / Unemp

Unemp Shock has a negative effect on the balance of payment balance (BOP) of 3.30 (C17). This means that the shock value of Unemp will increase by 1 billion rupiah, and the BOP shock will decrease by 3.30 percent. And the probability value is 0.00 <0.01. This means that unemployment shock does not significantly influence BOP shock.

3. Inflation Shock (Inflation / INF)

Reserve Requirement Shock

Reserve Requirement Shock has a negative effect on the inflation rate of 0.14 (C19). This means that if the shock the reserve requirement increased by 1 billion rupiahs would cause shock inflation decreased by 0.14 percent. And the probability value of 0.401> 0.01, meaning that the shock the reserve requirement was not significant effect on INF shock.

Unemployment Shock / Unemp

Unemp Shock has a positive effect on the inflation rate of 2.27 (C26). This means that if Unemp's shock rises by 1 billion rupiah, it will cause inflation shock to increase by 2.27 percent. And the probability value of 0.0000 <0.01, meaning that unemployment shock has a significant effect on INF shock.

Balance of Payment Shock (BOP)

BOP Shock has a positive effect on the inflation rate of 0.31 (C27). This means that if the BOP shock increases by 1 billion rupiahs it will cause shock Inflation increases by 0.31 percent. And the probability value of 0.035> 0.01, meaning that the BOP shock has no significant effect on the INF shock.

4. Growth Shock (Growth / Grow)

Reserve Requirement Shock

Reserve Requirement Shock has a negative effect on the growth rate of 1.69 (C29). This means that if the reserve requirement shock increases by 1 billion rupiahs it will cause shock to decrease growth by 1.69 percent. And the probability value of 0,000 <0.01 means that the shock reserve requirement has a significant effect on shock GROW

Unemployment Shock / Unemp

Unemp Shock has a positive effect on the growth rate of 2.09 (C36). This means that if Unemp's shock increases by 1 billion rupiah, it will cause growth shock to increase by 2.09 percent. And the probability value of 0,0006 <0.01, means that unemployment shock has a significant effect on shock GROW

Balance of Payment Shock (BOP)

BOP Shock has a positive effect on the growth rate of 0.13 (C37). This means that if the shock of BOP increases by 1 billion rupiah, it will cause shock to increase growth by 0.13 percent. And the probability value is 0.411> 0.01, meaning that the BOP shock does not significantly influence the GROW shock

Shock Inflation (Inflation / INF)

INF Shock has a negative effect on the growth rate of 0.14. This means that if the INF shock increases by 1 billion rupiah, it will cause the growth shock to decrease by 0.14 percent. And the probability value is 0.312> 0.01, meaning that the inflation shock does not significantly influence the GR shock.

5.5 Impulse Response Function (IRF)

Table 5.1 Response of Unemp to Cholesky

Period	RR	UNEMP	BOP	INF	GROW
1	-0.000895	0.004035	0.000000	0.000000	0.000000
2	-0.000713	0.003123	-0.004605	0.000180	0.002951
3	0.004936	0.004076	-0.008343	-0.000585	0.004370
4	0.003883	0.004572	-0.007589	0.000554	0.004361
5	0.002553	0.003222	-0.006416	0.001890	0.004667
6	0.000808	0.003161	-0.004337	0.003311	0.003661
7	-0.000556	0.003190	-0.002237	0.003038	0.002896
8	-0.000752	0.002733	-0.001100	0.001729	0.002012
9	-0.000205	0.002137	-0.000975	0.000779	0.001031
10	-0.000302	0.001849	-0.000626	0.000602	0.000318
11	-0.001384	0.001648	-0.000731	0.001155	-0.000444
12	-0.002090	0.001207	-0.001823	0.001656	-0.000821

13	-0.002832	0.000629	-0.002461	0.002242	-0.001003
14	-0.003771	-0.000172	-0.002333	0.002801	-0.000680
15	-0.004649	-0.000734	-0.001998	0.002809	5.25E-05
16	-0.004952	-0.000954	-0.001892	0.001857	0.000899
17	-0.004145	-0.001114	-0.001865	3.82E-05	0.001674
18	-0.002494	-0.001297	-0.001568	-0.002015	0.002373
19	-0.000786	-0.001351	-0.001054	-0.003645	0.002984
20	0.000500	-0.001180	-0.000762	-0.004639	0.003326

The table above shows the second column shows the shock of the Statutory Reserves (GWM) of one standard deviation will result in a decrease of 0,0009%. Likewise in the second period, the shock of the reserve requirement also results in unemployment to fall by 0,0007%, but in the third period to the sixth period, the shock given to the reserve requirement will cause unemployment to increase respectively by 0.004936%, 0.003883%, 0.002553%, 0.000808%. Furthermore, in the seventh to the 19th period the shock of the reserve requirement will result in unemployment to fall, only in the 20th period the shock of the reserve requirement causes unemployment to increase by 0,0005%.

In the third column shows how the unemployment response due to shock equal to one standard deviation from imports. In period one, the import shock caused unemployment to fall by 0.001%, as well as in the second to the 12th period, the import shock caused the unemployment response to decrease. But after that in the 13th period, shocks to imports caused unemployment to increase by 0.001%, until the 15th period, the shock of imports still caused unemployment to increase, respectively by 0.002%, 0.0008% ,. Furthermore, in the 16th to the 20th periods, shocks to imports caused unemployment to decrease. Until the end of the 20th period, shocks to imports caused unemployment to decrease by 0.005%.

In the fourth column, it can be seen how the effect of investment shock (INV) of one standard deviation on unemployment. In the period one to the fifth period, the shock given by the INV will provide an unemployment response to be increasingly reduced. The amount of change is 0.009%, 0.007%, 0.007%, 0.004%,%, 00056%. After that period the INV shock turned out to give a positive response to unemployment, precisely in period 6 to period 11. After that in the period 12 to period 20, the INV shock turned out to result in unemployment to be reduced. Until the 20th period, the unemployment response was 0.001.

In the fifth column, from here it can be seen how the effect of unemployment shock (UNEMP) of one standard deviation on unemployment. In period 1 to 13, shocks given to Unemp caused unemployment to increase. Furthermore, in the 14th-40th period, it turned out that the shock given caused unemployment to decrease. This means that if unemployment is in shock, this will cause unemployment to decrease.

In the sixth column, it can be seen how the effect of one standard deviation of growth (GROW) shock on the BOP value. In the first period the GROW shock caused the BOP value to not be affected, in the second period the GROW shock caused the BOP value to decrease 0.01%, then until the fifth period, the GROW shock, still caused the BOP value to continue to decline. At the beginning of the middle period, the sixth period, GROW shock caused the BOP value to increase by 0.06%. In the tenth period GROW shock caused the BOP value to increase by 0.11%. Furthermore, in the 15th period the INF value decreased by 0.002%. And at the end of the research period, the 20th period, GROW shock caused the BOP value to increase by 0.007%.

To simplify the discussion of the response of the unemployment variable is summarized into three time periods, namely short term (1-5 years), medium term (6-10) years, and long term (more than 10 years). In the short term it is

known that the unemployment response is largely responded by other variables positively, while in the medium and long term the unemployment response is responded positively and negatively simultaneously. A positive sign means that the unemployment response has increased due to shock given by the research variables, as previously described. While the negative sign means that the unemployment response is reduced due to macro variable shock as previously described.

5.6 Impulse Response Function Inflation (INF)

Table 5.2 Response of Inflation to Cholesky (df adjusted) One S. D Innovations

Period	RR	UNEMP	BOP	INF	GROW
1	-0.050716	0.054849	0.249294	0.887557	0.000000
2	-0.668468	0.049760	-0.075915	0.752435	0.107203
3	-0.609965	-0.119473	-0.462079	0.052422	0.213616
4	-0.144634	-0.233692	-0.004879	-0.304385	0.231686
5	0.200340	-0.167077	0.490915	-0.492683	0.412896
6	0.342990	0.073844	0.257348	-0.725829	0.558970
7	0.561296	0.230031	-0.310835	-0.825301	0.354506
8	0.874339	0.139939	-0.395363	-0.754708	0.153280
9	0.747589	-0.003210	0.006833	-0.381213	0.107397
10	0.235121	-0.013669	0.156654	0.128222	0.133051
11	-0.228615	0.110102	-0.082724	0.381197	0.050255
12	-0.342612	0.108204	-0.290361	0.270426	-0.059231
13	-0.225280	-0.054893	-0.193314	0.122717	-0.067828
14	-0.224636	-0.126704	0.030326	0.165681	0.011201
15	-0.367875	-0.008819	0.047483	0.219187	0.065943
16	-0.344082	0.107283	-0.177419	0.078213	0.036753
17	-0.065539	0.058872	-0.312821	-0.130260	0.001704

18	0.129230	-0.061485	-0.153250	-0.143020	0.036559
19	0.020816	-0.081490	0.048425	0.013166	0.113172
20	-0.174456	0.001730	0.004890	0.070026	0.142292

Next is to see how the shock of one standard deviation of endogenous variables on the value of inflation (INF). From the table above in the second column, it can be seen how the effect of the shock of Reserve Requirement deviation to the INF value. In the first period of shock the reserve requirement caused the INF value to decrease by 0.05%. The fall in the INF value due to the shock of reserve requirement still occurred until the fourth period. Furthermore, in the fifth to the tenth period the INF value rises, meaning that in the medium term the shock of the reserve requirement causes the INF value to rise by 0.34%. Then at the beginning of the medium term, the tenth period, the INF value increased by 0.23%. But in the eleventh period the shock of the reserve requirement caused the INF value to fall. And at the end of the study period the INF value also dropped due to shock given by the reserve requirement of 0.17%

In the third column of the table, it can be seen how the effect of the shock of one standard deviation of unemployment (Unemp) on the INF value. In the first period of shock, the results of the INF shock increased by 0.05%. Furthermore, in the fifth period the INF value fell due to shock unemp of 0.17%. At the beginning of the medium term, the sixth period, shock unemp caused the INF value to increase by 0.07%. At the beginning of the long run, the tenth period of the INF value decreased by 0.01% due to shock unemp. In the 15th period the INF value decreased by 0.008%. And at the end of the study period, the 20th period, shock unemp caused the INF value to increase by 0.001%.

In the fourth column of the table, it can be seen how the shock of a Balance of Payment (BOP) standard deviation on the value of inflation. In the first period, the BOP shock caused the INF value to increase by 0.25%, then the second to the fourth period the INF value fell. In the fifth period of BOP shock, the INF value rose by 0.49%. At the beginning of the middle term, the sixth period of BOP shock caused the INF value to increase by 0.28%. At the beginning of the long term, the tenth period of BOP shock caused the INF value to increase by 0.16%, and at the end of the 20th period, the BOP shock caused the INF value to increase by 0.004%.

In the fifth column, it can be seen how the shock of one standard deviation of inflation (INF) on inflation itself. In the first period the INF shock caused an increase in INF of 0.89%, an increase in inflation continued until the third period. In the fifth period the INF shock caused the INF value to decrease by 0.49%. At the beginning of the medium term, the sixth period of INF shock, caused the INF value to decrease by 0.73%. At the beginning of the long-term period, the tenth period of INF shock caused the INF value to increase by 0.13%. In the 15th period, the INF shock caused the INF value to increase by 0.22%. At the end of the study period, the 20th period, the INF shock caused the INF value to increase by 0.07%.

In the sixth column of the table, it can be seen how the effect of the shock of one standard deviation of growth (GROW) on inflation (INF). In the first period the shock GROW caused the INF value was not affected, in the second period the shock GROW caused the INF value to increase 0.11%, then until the fifth period, the shock GROW, still caused the INF value to continue to increase. At the beginning of the middle period, the sixth period, GROW shock caused the INF value to increase by 0.56%. In the tenth period GROW shock caused the INF value to increase 0.13%. Furthermore, in the 15th

period the INF value increased by 0.06%. And at the end of the study period, the 20th period, GROW shock caused the INF value to increase by 0.14%.

And in brief how the response of the inflation variable due to shock from its endogenous variables can be seen in Table 5.24. It can be explained that in the medium to long term it is known that the inflation response is largely responded by other variables positively. While in the short term, other variables respond positively and negatively together. A positive sign means that the inflation response (INF) has increased due to the shock given by the research variables, as described previously. While the negative sign means that the inflation response (INF) is reduced due to macro variable shock as previously described.

5.7 Impulse Response Function Growth (GROW)

Table 5.3 Response of Grow to Cholesky (df adjusted) One S. D Innovations

Period	RR	UNEMP	BOP	INF	GROW
1	-0.234694	-0.021603	0.079341	-0.171645	0.284038
2	-0.058139	0.003526	0.203092	-0.140860	0.051733
3	0.060360	0.030786	0.051081	-0.057399	-0.066534
4	0.169872	0.009048	0.092824	-0.078183	-0.089619
5	0.037125	0.024791	0.167643	0.042675	-0.140998
6	0.074845	0.005056	0.081135	0.115466	-0.092325
7	0.006579	0.069030	0.019718	0.138278	-0.088035
8	-0.037698	0.035212	-0.058296	0.122291	-

					0.056860
9	-0.046421	0.006839	-0.074695	0.125967	-0.048589
10	-0.086001	0.011152	-0.027640	0.136385	-0.030206
11	-0.113843	0.028544	-0.001256	0.120444	-0.018454
12	-0.071451	0.037831	-0.029431	0.075568	-0.027629
13	0.007927	0.031073	-0.023749	0.027426	-0.029568
14	0.040006	0.019085	0.031886	0.022369	-0.028520
15	0.036198	0.018293	0.056366	0.034334	-0.018270
16	0.021083	0.033533	0.038714	0.031677	-0.020921
17	0.024556	0.031897	0.014074	0.014690	-0.032870
18	0.038212	0.012922	0.016858	0.008942	-0.039025
19	0.023439	0.002522	0.038236	0.029139	-0.036654
20	-0.011839	0.009110	0.039630	0.052728	-0.035444

From the table above, it can be seen how the shock of Reserve Requirement deviation affects the GROW level. In the first period of shock the reserve requirement caused the GROW level to decrease by 0.23%, then the GROW level also continued to decline. In the fifth period of shock the reserve requirement can increase the growth rate (GROW) of 0.03%. At the

beginning of the medium term, the sixth period of the reserve requirement shock resulted in the GROW level increasing by 0.07%. At the beginning of the long-term period, the tenth period, the reserve requirement shock caused the GROW level to decrease by 0.09%. In the 15th period the shock of the reserve requirement caused the GROW level to increase by 0.03% and at the end of the study period, the 20th period, the shock of the reserve requirement caused the GROW level to be reduced by 0.01%.

In the third column, it can be seen how the impact of the shock of one standard deviation of unemployment (Unemp) on the GROW level. In the first period, it can be seen that shock unemp caused GROW levels to decrease by 0.02%. In the second to the 20th period, shock unemp caused GROW levels to increase. In the fifth period, shock caused the GROW level to rise by 0.02%. In the sixth period the GROW level rose by 0.005%. At the beginning of the long term, namely the tenth period, shock unemp caused the GROW level to increase by 0.01%. In the 15th period the GROW level increased by 0.02%. And at the end of the period which is the 20th period, shock unemp causes the GROW level to increase by 0.009%.

In the fourth column, it can be seen how the shock of one standard deviation of the balance of payment (BOP) is to the GROW level. In the first period the BOP shock caused the GROW level to increase by 0.08%, in the fifth period the BOP shock caused the GROW level to increase by 0.17%. In the sixth period the GROW level increased by 0.08%. At the beginning of the long term, the tenth period, the BOP shock causes the GROW level to decrease by 0.03%. In the 15th period the GROW level increased by 0.06%. And in the long-term period, the 20th period, the BOP shock caused the GROW level to rise by 0.04%.

In the fifth column, it can be seen how the effect of the shock of one standard deviation of inflation (INF) on the GROW level. In the first period,

the INF shock caused the GROW level to decrease by 0.17%, in the fifth period the GROW level rose by0.04%. At the beginning of the medium term, the sixth period of INF shock caused GROW levels to increase by 0.11%. In the tenth period the GROW level still increased by 0.14%. In the 15th period, the INF shock caused GROW levels to increase by 0.03%. And at the end of the study period, in the long run, shock INF caused GROW levels to increase by 0.05%. And at the end of the research period the INF shock caused GROW levels to increase by 0.05%.

In the sixth column, it can be seen how the shock of one standard deviation of growth (GROW) affects the level of GROW itself. In the first period the GROW shock caused the GROW level to increase by 0.28%. In the fifth period the GROW level decreased by 0.14% due to shock from GROW. In the sixth period the GROW shock caused the GROW level to drop by 0.09%. Furthermore, at the beginning of the long term, the tenth period of GROW shock caused the GROW level to decrease by 0.03%. In period 15, the GROW level decreased by 0.01%. And at the end of the research period in the long term, the 20th period, shock GROW caused GROW levels to decrease by 0.03%.

5.8 Result

The study of monetary transmission mechanisms generally refers to the role of money in the economy which was first explained by Irving Fisher in the Quantity Theory of Money. This theory basically develops a clear framework for a systematic analysis of the direct relationship between the growth of the money supply and inflation, which is expressed in an identity known as The Equation of Exchange "MV = PT". In a balance the money supply used in all economic transaction activities (MV) is equal to the nominal output, which is transacted (PT).

Under this mechanism in the short run, the growth in the money supply only affects the development of output. Furthermore, in the medium term, the growth in the money supply will drive up prices (inflation), which in turn will cause a decrease in the development of output to its original position. In the long-term balance, the growth in the money supply does not affect the development of output, but encourages a proportional increase in the growth rate of inflation growth. This direct monetary channel is considered unable to explain the factors other than money to inflation, such as interest rates, exchange rates, asset prices, credit and expectations. (Maski, 2007)

Furthermore FR.Haryanto (2007) in his dissertation on the Impact of Monetary Instruments on the Indonesian Economy: An Analysis of the Monetary Transmission Mechanism Path, analyzing an increase of 50% of the main variables on each path of the monetary transmission mechanism is also evaluated on the impact of several key variable combinations in each monetary transmission mechanism path in each analysis period. Research. The main variables in this study are the money supply, base money, mandatory minimum reserves, the interest rate of Bank Indonesia certificates, the amount of credit, interest rates, interest rates, inflation rates, investment and value exchange rates (FR Haryanto, 2007). In carrying out the simulation the authors do based on the paths, so that research is not done in an integrated manner involving all variables both monetary instruments, intermediate targets and macro indicators generally used. In addition this study does not include new variables such as government bonds which are instruments of open market operations

Research with almost the same study was also conducted by Sutardjo, 2005. This dissertation aims to see how the indirect effects of monetary policy carried out in Indonesia on exports in the period before and after the crisis, analyze which monetary policies play the most role in exports, and see the

impact of shock changes made by monetary policy on exports. The results of this study indicate that in the period before the crisis, in the short term the CAR variable significantly affected exports, in the long run all variables such as EX RATE, LEDR and M2 were significant. While in the post crisis period, in the short term the reserve requirement has a significant effect on exports. But in the long run Bank Indonesia Certificate Interest Rate, RR, CAR and LDR are all significant and negatively related to exports.

While this research generally looks at the goal of finding out how the influence of monetary policy instruments; variable Reserve Requirement, against macroeconomic indicators; unemployment rate (UNEMP), Balance of Payments (BOP), Inflation rate (INF), and Growth Rate (GROW). The findings in this study try to integrate all the variables of monetary instruments and intermediate targets in achieving the ultimate goal of macroeconomic indicators.

5.8.1 The Effects of Monetary Policy Instruments and Variable Target towards Unemployment

Increased Reserve Requirement instructed by Bank Indonesia to commercial banks. This condition indicates that Bank Indonesia is carrying out a contractionary monetary policy, even though the discount rate facility (rDiskonto) instrument has lowered the interest rate, with a figure that is much smaller than the increase in reserve requirement. The fall in the discount rate, followed by unemployment (UNEMP) increased.

The results of this study are not in line with the NAIRU model, which links interest rates, inflation, real output and unemployment. The NAIRU model explains that rising interest rates are a reaction to rising wage levels that cause inflation, causing real output to decline, because high interest rates do not encourage investors to invest, consequently unemployment increases.

Although it has results that are not in line with the NAIRU model, this study presents a more integrated and detailed flow so that the mechanism of monetary policy transmission becomes more directed to find out how the influence of monetary policy instruments on unemployment.

When compared with the Phillips curve theory, presented by A.W.hillhillips which explains how inflation affects unemployment, that the increase in aggregate demand due to the policies made, resulting in increased output. And increasing output causes unemployment to decline. The previous increase in output will raise the price and wage levels, causing inflation, so when unemployment goes down, inflation increases. Inflation that occurs is inflation that originates from demand pull inflation, due to increased real output growth that is not matched by the production side which results in an increase in the price level. Furthermore, contractionary economies such as raising interest rates are made to reduce the money supply, which causes inflation to fall in the short term, but unemployment increases again. The results of this study are consistent with those described in the Phillips Curve theory that contractive monetary policy ultimately results in depreciation of the exchange rate, and exports increase because foreign prices are more promising for investors than domestic sales, while imports fall. This good condition was apparently not followed by an increase in the amount of investment in Indonesia, due to other conditions that were less supportive, resulting in increased unemployment. The results of this study explain in more detail how the effects of contractionary monetary policy on unemployment, compared with the theory presented by AW.Phillips.

5.8.2 The Effects of Monetary Policy Instruments and Variable Target towards Balance of Payment

The Mundell-Fleming model describes how the balance of financial markets and goods markets in an open economy, and adheres to an exchange rate regime (Mankiw 2000; Taylor, 1999). An increase in the exchange rate is a depreciation in the value of the domestic currency. Capital flows are assumed to respond to differences in interest rates between domestic and foreign currencies. An imbalance in the BOP results in an increase in the imbalance in the international exchange rate. BOP Surplus is excess demand for domestic money in the foreign exchange market. The desire of foreigners to buy domestic goods and services is greater than the desire of domestic residents to buy goods and services from abroad. BOP deficit is excess supply of domestic money on the foreign exchange market. The desire of domestic residents to buy goods and services from abroad is greater than the desire of foreigners to buy from within the country. At Floating Exchange Rate there is the term BOP Surplus, which is excess demand for domestic currency. Domestic currency appreciated: While BOP Deficit is excess supply of domestic currency. Domestic currency depreciates:

The exchange rate adjustment entered by the BOP incipient this imbalance results in a movement towards the IS curve. If BOP is surplus; , the IS curve will move to the left. And if BOP is deficit; IS curve will move right.

FR. Haryanto, 2007 explained that the sensitivity of investment with regard to changes that occur in the variable balance sheet increases throughout the period of monetary contraction. When contracted monetary policy gives birth to the opposite effect on real investment as long as the company's balance sheet is supported, a conducive monetary condition will improve the company's balance sheet, so investment is not the answer in this study. Under the condition of a weak balance sheet, a symmetrical

consequence of monetary policy, for example the strong negative effect which is stronger in relation to contraction, still does not have much power in terms of expansion becoming more possible.

Furthermore, the SVAR estimation results show how the influence of monetary policy instruments and intermediate targets on the balance of payments. From the results of this study, this study was found that when the central bank increases the number of securities by buying from commercial banks and the public or when the variable Reserve Requirementdecreases this condition causes investment (INV) to increase, the number of unemployed (UNEMP) down, and this improved condition will cause the balance of payments (BOP) to be a surplus

In general, the results of this study are in line with the Mundel Fleming Model, which explains that when the interest rate falls (r falls), followed by increased investment, and appreciation of the exchange rate which results in a balance of payments surplus. There is only a slight difference, the results of the study show that the value of exports fell while imports increased, but this condition still caused the investment value to increase, the amount of unemployment to decline, and finally the balance of payments became a surplus. This study not only uses the interest rate as its monetary instrument, but also uses open market operations and minimum statutory reserves to further clarify the effect of monetary instruments on the real sector.

When compared with FR Haryanto's research, which explains conducive monetary policy will improve the balance of payments, while investment is not a determining variable. The results of this study are not in line with FR Haryanto's research, in this study it is explained that investment is one of the variables that determines the size of the balance of payments, because an increase in investment is one of the contributors of capital accumulation so that the balance of payments becomes a surplus. Furthermore, in this study it

is explained that an expansionary monetary policy through increasing OMO variables, a lower reserve requirement and discount rates will result in increased investment.

5.8.3 The Effects of Monetary Policy Instruments towards Inflation

The Phillip Cagan adaptive expectation model is a dynamic inflation model, a model that explains the relationship of price levels and money stock. Cagan's reason for using these two variables is related to the price level and money stock movements during periods of high inflation or hyper-inflation which is very surprising. The Cagan model concludes that if price dynamics are stable, demand for real money stocks is also stable. This means that the impact of price changes in period (t-1) will result in price changes in period (t) which are getting smaller and in period (t) infinitely equal to the equilibrium price. Conversely, price dynamics are unstable if prices in the period (t) are infinitely greater than equilibrium prices or prices do not reach equilibrium (Manurung, 2008).

Furthermore Trihadmini, 2008 in his research entitled Election of inflation targeting, macro variable responses to inflation, and inflation determinants in Indonesia used several variables including the exchange rate, SBI interest rates, M0 money supply, M1 money supply, Consumer Price Index (CPI)), Real GDP, Consumption Expenditures. By using the Vector AutoRegrression method it is found that the determination of inflation in Indonesia in the pre-crisis period is more influenced by the money supply, while in the post-crisis period it is more influenced by exchange rate depreciation. The role of expected inflation is quite large both in the practical and post-crisis periods.

Research on the determinants of inflation was again conducted by Alexander (2009), which examined the factors that influence inflation in

Indonesia during 2008 using multiple linear regression. The results showed that the BI rate, M2, and government spending had a positive and significant impact on inflation. While the unemployment rate has a negative impact, but it is not significant.

Furthermore Sunarjo, 2002 stated that the exchange rate variable had a positive and significant effect on inflation, the interest rate had a negative and significant effect and bank credit had a positive and significant effect on inflation.

Furthermore the SVAR estimation results show that when the number of Reserve Requirement decreases, the unemployment rate (UNEMP) increases, the balance of payment surplus (BOP) increases, and this condition causes the inflation rate (INF) to also increase.

When compared to the Inflation Model Expectation Model of Cagan, which tries to predict how the effect of an increase in money stock on price increases, the weakness of this model is that once a systematic error occurs to individual inflation expectations, then the individual makes an error of expectation in subsequent periods. The available information has never been considered by individuals in setting expectations in the next period, other than that systematic errors in setting expectations that have been made by individuals tend to get smaller, where the expectation model is constant. While the results of this study are estimates from SVAR, describing the conditions of inflation determination for the period 2000 - 2011. From these estimation results, policy makers can make it a logical basis for action, compared to using the forecasting model of the Cagan Model.

Furthermore, this research is not in line with the research submitted by Trihadmini who stated that after the crisis the determination of inflation in Indonesia was the depreciation of the exchange rate and inflation expectations. While the results of this study produce that inflation that

occurred in the post-crisis period was influenced by the appreciation of the exchange rate, which was followed by an increase in exports, decreased imports, decreased investment, increased unemployment, and inflation also increased.

This study also does not support what Sunarjo explained, 200, there are differences in the relationship between exchange rate, interest rate and credit variables to inflation. This is possible because of the different study periods. So there are several different policies

5.8.4 The Effects of Monetary Policy Instruments towards Economic Growth

The most important contribution was made by Solow and Swan, emphasizing the importance of saving and capital formation for the economic development and sources of growth of a country. By using the Neo-Classical production function, where the model specification assumes a constant return to scale, diminishing returns for each input, and positive elasticity of substitution between inputs. It was explained that a high amount of savings is not necessarily good if it is not accompanied by a high level of consumption. The condition chosen should be a steady state with a high level of consumption, called the Golden Rule level of capital. This study assumes that the population and workforce are constant. Furthermore, the study will be expanded to include population growth and technological progress. So it finally concluded that technological will can lead to sustainable growth in output per worker, on the contrary the high saving rate leads to high growth only if steady conditions are achieved. If the economy is already in a steady state the growth rate of output per worker depends only on the level of technological progress.

On the other hand, New Growth Theory states that countries do not always experience steady-states in the long run. For example, a study by Luca (1998) which states that human resources as endogenous variables will not experience diminishing returns on a combination of the accumulation of human resources and capital goods. In other words, long-term growth continues. Constans return to scale occurs due to positive externalities in the development of knowledge that can increase output and growth.

M. Erwan, 2005, The Effect of Foreign Debt, Domestic Savings, Exports, and Foreign Direct Investment on Indonesia's Economic Growth. This study aims: (1) to find out how much influence foreign debt, domestic savings, exports, foreign direct investment has on Indonesia's economic growth; (2) to find out how much influence the interest rates, taxes, economic growth, foreign debt and domestic savings of the previous year on Indonesia's domestic savings; (3) to find out how much influence the interest rates, economic growth, domestic savings, foreign direct investment, and foreign debt have on the exchange rate of the rupiah; (4) to find out how much influence foreign direct investment, taxes, the rupiah exchange rate and economic growth have on foreign debt.

The test results show that (1) foreign debt received by Indonesia so far, especially long-term foreign debt has no effect on Indonesia's economic growth; (2) foreign direct investment as a source of financing earmarked for the development of the economic sector, apparently still has not contributed significantly to Indonesia's exports and economic growth; (3) short-term external debt and the previous year's domestic savings affect Indonesia's domestic savings.

Gulo, 2008, concluded that fiscal policy and monetary policy together influence the economic growth of Indonesia. Partially, government spending has a positive and not significant effect on Indonesia's economic growth,

while the money supply and tax revenue in the previous year have a positive and significant effect on Indonesia's economic growth.

The results of SVAR estimation research on the influence of monetary policy instrument variables, intermediate target variables on Indonesian growth, were found that when followed by a decrease in the statutory reserve requirement (GWM) which was followed by unemployment (UNEMP) increased, the balance of payments (BOP) deficit, the inflation rate (INF)) decreases, eventually growth increases.

Sollow Swan growth theory explains that economic growth occurs if a country has implemented a high and efficient technology, the amount of savings and investment will also increase economic growth with the assumption of a constant population and technological progress but it turns out the population is not constant in addition to investment and high savings then a high level of consumption is needed to increase growth. The results of this study are not in line with Sollow Swan's growth theory and Lucas's research results which are an extension of Sollow Swan's theory, it was found that when the relationship between investment and unemployment is negative, investment is one source of capital accumulation. It turned out that the growth that occurred was not driven by investment growth, but was driven by lower levels of inflation and unemployment, thereby encouraging people's purchasing power and increasing growth.

CHAPTER VI
CONCLUSION

Based on the results of the interpretation of processed SVAR data, that there are no significant variables affecting unemployment of the twelve research variables. But these five variables have different directions to unemployment Reserve Requirement, have a positive direction to the unemployment variable,

Based on the results of the processed SVAR interpretation of the data, that the Reserve Requirement has no significant effect on the balance of payments (BOP). While the relationship between variables of monetary instruments and targets between the balance of payments (BOP) is different.

Based on the interpretation of the results of processed data with SVAR, it can be seen that some variables which are significant to the inflation variable are unemployment (UNEMP) and balance of payments (BOP), while the minimum statutory reserve variable (GWM) does not significantly influence inflation. While there is a positive relationship between monetary instruments and inflation variables, unemployment (UNEMP) and the balance of payments

Based on the results of interpretations of the processed SVAR data, it is known that several variables have no significant effect on the growth (GROW) of the balance of payments (BOP), and inflation (INF), while the import variables (IMP), balance of payments (BOP), inflation (INF) and no significant effect on growth (GROW).

While the relationship between the two variables Based on the results of the impulse response function can be explained that in the short term it is known that the unemployment response is largely responded to by other

variables positively, while in the medium and long term the unemployment response is responded positively and negatively simultaneously. While.

Based on the results of the impulse response function, it can be explained that in the short, medium and long term periods, it is known that the balance of payment response is mostly responded positively by other variables.

Based on the results of the impulse response function, it can be explained that in the medium and long term it is known that the inflation response is largely responded by other variables positively. While in the short term, other variables respond positively and negatively together

Based on the results of the impulse response function, it can be explained that in the short and long term it is known that the growth response is largely responded by other variables negatively, and positively in the medium term.

In the short-term and medium-term periods the investment variance (INV) dominantly contributes to unemployment (UNEMP), whereas in the long-term period the import variance dominantly contributes to unemployment (Unemp) ..

In the short and medium term the variance of the balance of payment shock (ε BOP) dominantly contributes to the balance of payments (BOP), the long-term variance of the import (ε rIMP) predominantly contributes to the balance of payments, meaning that the import shock greatly contributes to the balance of payments, if import shock increase the amount of the balance of payments will also increase and vice versa.

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