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“ANALYSIS OF INFLATION AND THE INFLUENCE FACTORS OF INFLATION; CASE OF INDONESIA”

THESIS



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THESIS IS SUBMITTED IN PARTIAL FULFILLMENT OF THE
REQUIREMENTS FOR THE BACHELOR DEGREE
FROM
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2011**

For myself,,,

Thank you for not giving up until through this way...

For still stand, even many things happen...

Still believe that God stays always beside me,,,

To do this and that...

And still must go on until I get success one day,,,

"Life is not about how well you have weathered the storm. It's about how well you danced in the rain"

=When we embrace what lies within, our potential knows no limit.

The future is filled with promise. The present, rife with expectation.

But when we deny our instinct, we struggle against our deepest urges

And, Uncertainty begins=....

=To be happy, someone must live absolutely in the present, no thought of what's gone before and no thought of what lies ahead. But a life with meaning, someone is condemned to wallow in the past and obsess about the future=...

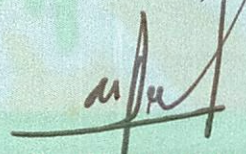
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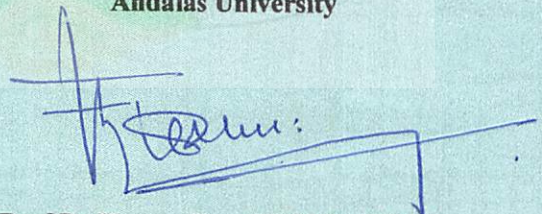


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Analysis of Inflation and The Influence Factors of Inflation; Case of Indonesia

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ABSTRACT

This study analyzed about Inflation and The Influence Factors of Inflation ;Case of Indonesia during the period 1991-2010. The inflation problem in Indonesia was caused by structural of economic obstacles that still occur in Indonesia. Some variables were used in this thesis, such as money supply, GDP, exchange rate, and import. The Ordinary Least Square method was used to carry out to the study. According to the result, exchange rate is significantly and negatively effect the inflation in Indonesia, money supply, Gross Domestic Product and import are significantly and positively effect the inflation in Indonesia. All these findings will be use to analyze the reasons for inflation better and be useful references to the research for the future.

Keywords : Inflation, exchange rate, money supply, import and GDP.

This thesis has been presented before the examiners in the Thesis Examination and successfully passed the Thesis Examination on November 2nd, 2011.The abstract has been approved by the advisor and examiners:

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بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

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This academic writing is composed as partial fulfillment to obtain bachelor degree in International Program, Economics Department, Faculty of Economics, Andalas University. The researcher chooses **“ANALYSIS OF INFLATION AND THE INFLUENCE FACTORS OF INFLATION ; CASE OF INDONESIA”** as the title of the thesis.

The purpose of this paper is to prove whether inflation has effect with influence factors or macroeconomics indicators that influence of it. It will give contribution in setting appropriate monetary policy in order that, a good economy can be achieved.

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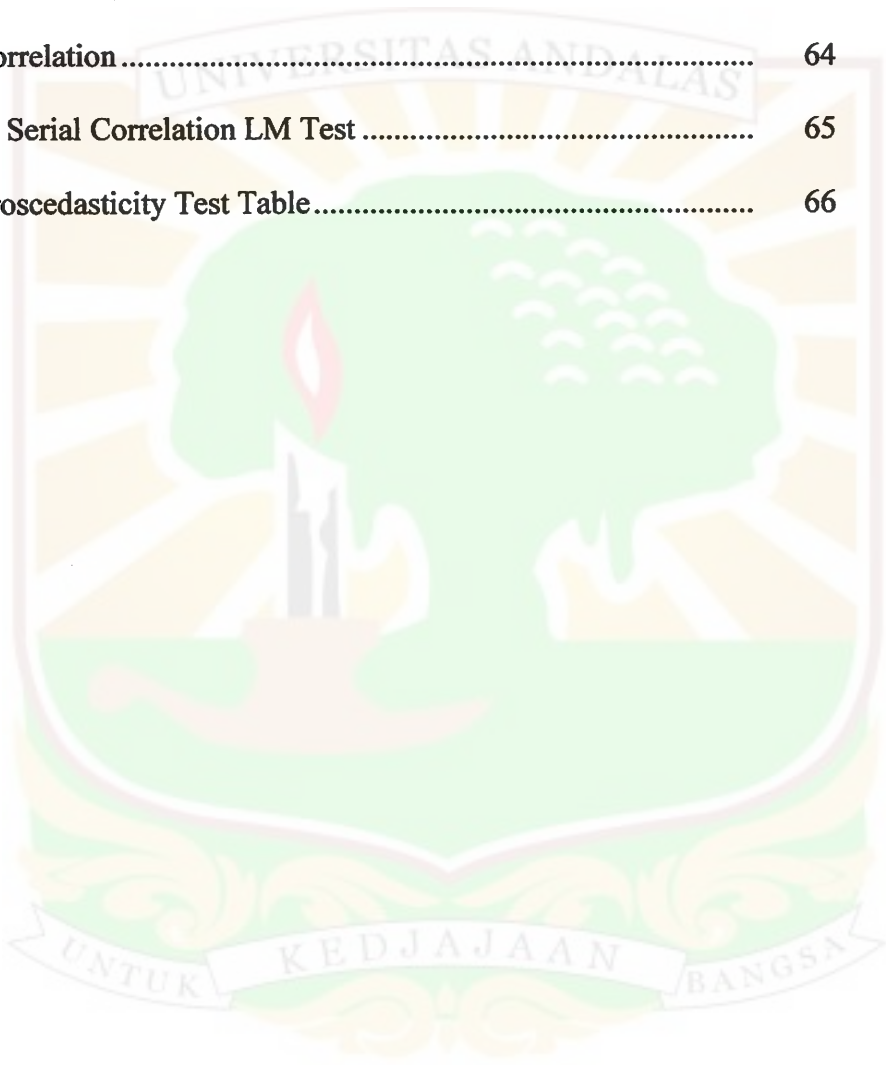
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CHAPTER I

INTRODUCTION

1.1. Problem Background

Indonesia is one of the developing countries that have many good resources and human resources to support development from many aspects, especially in economics aspect. Indonesia was expected to be able to compete with other countries because the developed country is the country that has a great economics and stability. The inflation phenomenon in Indonesia actually is not the short-term phenomena, that is only happens incidentally (Adwin, 1999). In fact, the same general problem also happens in others developing countries. The inflation problem in Indonesia is the kind of long-term inflation that caused by structural of economic obstacles that still occur in Indonesia. The economics and stability were influenced by many factors, some of the factors which influences the development of economics is the level of inflation rate (Friedman, M, 1977). Inflation is an indicator of economic stability which becomes focus and attention in macroeconomics policy so that its growth rate is always afforded to be low and stable. (Bank of Indonesia, 2003).

In economics of Indonesia, the problem about inflation is important, because inflation is macroeconomic indicator that has effected to economics condition that often fluctuated. Indonesia had experienced about fluctuations ever happened in a crisis occurred in 1998, due to crisis in the monetary sector, the high liquidity assistance provided forced central banks to any banks to increase money supply in large enough to enlarge the previous inflationary pressures which increased sharply due to the sharp depreciation of the rupiah and rupiah currency volatility after the crisis. The condition of economy in Indonesia in that time made rupiah became weak, also led to open unemployment.

Since 1999, Indonesia has implemented a new law for the Central bank. The new law stated that Indonesian Central Bank (BI) must be independent from intervention of political pressure, and central government in conducting monetary policy. Moreover, central bank is only responsible for price stabilization as the one goal policy rather than multiple objectives such as promoting economic development and growth, exchange rate stability, and maintaining financial stability which are stated in the previous law. The new law of Indonesian Central Bank has brought a new era for the monetary and fiscal policies in Indonesia. There are extensive literatures regarding the interaction of monetary and fiscal policy, theoretically and empirically. Recently, the debate on the optimal relationship between monetary and fiscal authorities has become a big issue in macroeconomic policy.

Since 1970s, the issue was centered on the inflationary consequences of the monetary financing of the fiscal deficit. The moderate inflation of the 1970s in some industrialized countries and, the recurring episodes of high inflation in several developing countries, in particular, justified this focus. Some economists (Kydland and Prescott, 1977) and (Rogoff, 1985) suggested that monetary policy should be determined by rules rather than discretion strategy and proposed that monetary policy should be controlled by independent authority.

Therefore, the new environment of macroeconomic policies in form of the separation between monetary and fiscal policy arose, it became one of the triggers in the explosion of higher unemployment in a relatively short time. Unemployment explosion occurred in 1998, raise about 1.4 million new unemployment. These developments clearly illustrate that the crisis has happened lead to a very broad negative impact to the joints national economy. Inflation rate is defined as the increase in overall prices and a sustained (Don Bush, 1982).

Indicators of the inflation not only as a macroeconomic variable or indicator generally, but also has a role to be control variable of policy and indicator that has been targeting to reach the certain goal from government policy, because the inflation often to be the problem of price change. Indonesia had experienced of high inflation in year 1966 and 1997 and 1998 at the beginning of reformation era, this condition was very influence to Indonesia's

economy, and was seen obviously from private companies toward bankrupt and automatically unemployment which became problem for Indonesia. The rate of inflation is an important indicator, because the alteration of inflation rate can have a negative impact on the welfare of society. High inflation rate would bother consumers who have a steady income, because with the inflation (rising prices), their real incomes will fall. Thus their ability to meet the needs of living (purchasing power) will also be reduced.

Indonesian Central bank is always trying to keep inflation at low and stable level. Inflation low and stable will be able to minimize the bad impact of price increases for public welfare and simultaneously make it easier for companies to make business planning which can be seen what occurred in 1998, if inflation was not pressed to cause increasing levels of unemployment, while the unemployment rate is one symbol of low national production which can affect a country's economic growth. While in 1998, inflation reached its high level at 77.8% thus it impacted to raise unemployment as 1.4 million, or in other word 10.84% of labor force in Indonesia were unemployment.

Inflation is the economic disease that cannot be ignored, because it can have a great effect. Hence, inflation is often to be government target. High inflation is important to pay attention, remember the effect to economics that can not be stabilized, the growth of economics is slowly and unemployment continually increased, because of that the effort to control is important to be

stable, high inflation rate has to be avoided in order to development of economics will be great and economics achieve more. Since 1960, Indonesia has experienced in *hyperinflation* until 600%. The high of inflation according to researcher was because many of money supply even uncontrolled so that demand of money also high.

In 1970-s inflation could be pushed to 6,6% in 1972 and around 8,1% in 1978. Arndt, Sundrum, (1985). In 80s until 1996, inflation rate could control in one digit level. Indonesia economic crisis in the middle of 1997 made money supply, demand for money and inflation rate up in 11,05% and 78.343 Billion Rupiah and the top level in 1998 was 77,63% inflation and 101.197 billion rupiah (BPS).

Economic crisis 1997 in Indonesia has destroyed industrialization and economy toward slow economic growth. Monetary crises direct impact to demand for money, but the interest rate was chosen of government to control it. One of the crises was fluctuated of exchange value in serious condition. In 1998, the economy activity contraction was 12% per a year as a many company decreased activity and stopped production, and Inflation rate in 69,1% , based on the crisis Central bank has a goal and responsible to reach and keep the stability value of money supply which was published.

In the global activity, when money to be *fiat money* where country gives authority to central bank to publish of and print the money by belief, because of stability of rupiah from currency as a basic obligation to central bank to keep the society belief. The stability of currency, both inflation meaning and exchange value meaning are very important to support the development of economics continually and increase prosperity of citizens.

The stability of money can grow the believing of society and business activity in doing economic activity, likewise consumption and infestation, so that national economy can stimulate to be development economic. Moreover, controlled inflation can support purchasing power of society, vice versa instability of inflation and value exchange will be hard business activity in planning economic activity. Indonesia experience since 1998 showed how important to reach and keep inflation rate and value exchange stability, where experience showed money supply in out of control could emerge consequences and bad impact to economic whole.

Increase of money supply that exceed of expected in long term can bother economic growth, if this thing happen continually, the prosperity of society will decrease. The condition will bring the government efforts and monetary authority to control money supply in economics, that activity was called monetary policy that basically is one of integral from macroeconomic policy by monetary authoritative (Bank Indonesia, 2003:62).

Inflation has a relationship with the other macroeconomics indicators that influence of inflation, based on economics background and up and down of inflation in Indonesia by the thought from economy situation, the writer interest to doing research,

bring the problem and writing the problem to be thesis proposal which has title: ***“Analysis of Inflation and The Influence Factors of Inflation; Case of Indonesia”*** as topic of thesis. Thesis purposes to prove whether inflation has effect with macroeconomics factors or indicators that influence of it. It will give contribution in setting appropriate monetary policy in order that, a good economy can be achieved.

1.2. Research Questions

1. How is the development of inflation, money supply, gross domestic product, exchange rate, and import in Indonesia?
2. What is the relationship between inflation and the influence factors of inflation, such as money supply, gross domestic product, exchange rate, and import?

1.3. Research Objective

- 1. To describe and analyze the development of inflation, money supply, gross domestic product, exchange rate, and import in Indonesia.**
- 2. To examine and analyze the relationship between inflation and The influence factors of inflation, such as money supply, gross domestic product, exchange rate, and import.**

1.4.Hypothesis

Hypothesis that will be proved in this research is verify of inflation in Indonesia's economy. So, changes or high of inflation will give effect to the influence factors or indicators in macroeconomy.

1.5.Research Advantages

The advantages of this research are:

- 1. To fulfil requirements of Bachelor of Economics in Economic Faculty, Andalas University.**
- 2. For I and myself, to improve my ability in writing report and doing research, especially in monetary sector.**
- 3. For the reader is expected to add understanding regarding the economics analyze about context of inflation, the theory, and the relationship between**

inflation and The influence factors that influence of inflation, like money supply, gross domestic product, exchange rate, and import.

4. For the Investor is expected to provide a new discourse in considering those aspects that need to be taken into account in investment that are not solely rely on monetary measures.
5. For researcher in the field of economics and finance is expected this study can be a reference for the next research.
6. For society, will provide a proactive stimulus as a controller of economics and increase public awareness to reach stability of economic growth.
7. For government, will be recommended to take a better policy about inflation rate and others indicators, and how to handle of money supply, and how can reach a better economic growth.

1.6.Limitation of study

This research estimates the development of inflation and the relationship between inflation and the influence factors that influence of inflation, such as money supply, gross domestic product, exchange rate, and import over the period of 1991-2010. The writer classifies the variables into two groups where the inflation as dependent variable and money supply, gross domestic product, exchange rate, and import as independent variables. The study tries to explore the question where change level of inflation leads change level of the economic growth. In this research uses secondary data to see the influence of inflation, money supply, exchange rate,

gross domestic product, and import toward the economic growth. This research uses OLS (Ordinary Least Square).

1.7 Organization of Writing Systematic

This thesis divided into six chapters, which are:

1. CHAPTER 1: INTRODUCTION.

This chapter consists of problem background, research question, research objectives, hypothesis, limitation study and organization of writing.

2. CHAPTER 2: THEORITICAL FRAMEWORK AND LITERATURE REVIEW.

This chapter consists of The inflation Theory, the relationship between inflation and money supply, the relationship between inflation and gross domestic product, the relationship between inflation and exchange rate, and the relationship between inflation and import. To support the literature review some explanation from empirical studies in the past, as proven.

3. CHAPTER 3: RESEARCH METHODOLOGY.

This chapter consists of data source, analysis method, data analysis and another supporting concept.

4. CHAPTER 4: OVERVIEW ECONOMIC CONDITION OF INDONESIA

This chapter consists by an overview of the inflation, the money supply, the gross domestic product, the exchange rate, and the import in Indonesia.

5. CHAPTER 5: EMPIRICAL RESULT AND ANALYSIS

This chapter is result of empirical studies from this research.

6. CHAPTER 6: CLOSING

This chapter consists of conclusion of the study and implication on the future research.



CHAPTER II

THEORETICAL FRAMEWORK AND LITERATURE REVIEW

2.1 Theoretical Framework

In economics, inflation is a rise in the general level of prices of goods and services in the economy over a period of time. When the general price level rises, each unit of currency buys less of goods and services. Consequently, inflation also reflects an erosion in the purchasing power of money, a loss of real value in the internal medium of exchange and unit of account in the economy. A chief measure of price inflation is the inflation rate, the annualized percentage change in a general price index (normally the Consumer Price Index) over time.

2.1.1 Inflation

The term inflation originally referred to increases in the amount of money in circulation, and some economists still use the word in this way. However, most economists today use the term inflation to refer to a rise in the price level. An increase in the money supply may be called monetary inflation to distinguish it from rising prices, which may also for clarity be called price inflation. Economists generally agree that in the long run, inflation is caused by increases in the money supply. However, in the short and medium term, inflation is largely dependent on supply and demand pressures in the economy.

There is strong empirical evidence of a direct relation between long-term price inflation and money-supply growth, at least for rapid increases in the amount of money in the economy. That is a country such as Zimbabwe which saw rapid increases in its money supply also saw rapid increases in prices (hyperinflation). This is one reason for the reliance on monetary policy as a means of controlling inflation. This causal chain is contentious, however: some heterodox economists argue that the money supply is endogenous (determined by the workings of the economy, not by the central bank) and that the sources of inflation must be found in the distributional structure of the economy.

Theory of Inflation

Monetarist

Rapid inflation must be driven by high money supply growth. Inflation is always present and that is a monetary problem. This theory also says that the amount of money that exists will determine the amount of money that people spend, the price of items will go up only if the supply of the items is lower than the demand for the items, the price of items will also go down if the demand for the items is higher than the supply of the items.



Keynesian

Inflation can be caused by increase in demand and increase in cost. Concentrate on the institutional problems of people increasing their price levels. Keynesians argue that firms raise wages to keep their workers happy. Firms then have to pay for that and keep making a profit by subsequently raising the prices. This model differs from the classical model, Classics view changing money supply as affecting inflation while Keynesians view inflation as the cause of changing money supply.

Classical Theory

In the classical view of inflation, the only thing that causes inflation is, in reality, changes in the money supply. This theory can remember that the classics assume that velocity and output are independent and relatively constant. Thus, as money supply rises, that naturally up the price level, too, and increase in price level is inflation. The classical economists believe that there is a natural rate of unemployment, and the equilibrium level of unemployment of the economy.

Rational expectations theory

Inflation should be seen as a long-term projection and not just due to here and now. Although it is a lot like monetarism, the rational expectations theory believes that the monetarism theory reacts react too quickly to what is happening now and what happens down the road is more important.

The Austrian theory

As people will spend more money as they get more money to spend. This is kind of a spend what you earn philosophy. The lifestyle and spending habits of people are equal to their disposable income. This theory is different from the others because it did not believe that the production of goods will increase in order to meet an increase in demand.

The Marxist theory

The value of money is determined by the relationship between those that produce the goods and those that buy the goods. This theory says that it is the value of the labor required to produce the goods and not the price of the goods themselves that determines the real cost of the goods.

2.1.2. Theory of Inflation toward the Influence Factors of Inflation

2.1.2.1 Money supply

The relationship between money supply and inflation is explained differently depending on the type of economic theory used. In the quantity of money theory, also called monetarism, the relationship is expressed as $MV=PT$, or Money Supply x Money Velocity=Price Level x Transactions. The Velocity and Transactions are considered to be constants, so according to this explanation supply and prices have a direct relationship. In Keynesian theory, while there is still a relationship between money supply and inflation, it is not the only large factor that

can affect inflation and prices. Generally, the Keynesian theory stresses the relationship between total or aggregate demand and inflationary changes. According to Austrian Economics an increase in the money supply should result in inflation as the value of each old dollar is "diluted" by the printing of new dollars.

Changes in money supply are often used to try and control inflationary conditions. When a region is trying to lower inflation, central banks will generally lower lending rates and increase interest. When inflation drops below a target level, these standards are generally relaxed in an attempt to stimulate the economy. Usually, countries use a federal banking system to set lending and interest limits based on economic data. Unreserved money supply increases can sometimes lead to a condition called *hyperinflation*. This occurs when inflation jumps extremely high in a short period of time, though the exact definitions are somewhat variable.

Economists often say hyperinflation occurs when inflation jumps 50% in a month, but other estimates are also used. Money supply and hyperinflation are linked because the condition can result from a sudden, massive pouring of money into an economy with no associated rise in production or availability of goods. If, in the first example, the townspeople got a raise of \$500 USD a month, then the price of gas could suddenly multiply by many times, causing an extraordinarily high level of inflation.

2.1.2.2. Gross Domestic Product

Inflation can lead to uncertainty about the future profitability of investment projects (especially when high inflation is also associated with increased price variability). This leads to more conservative investment strategies than would otherwise be the case, ultimately leading to lower levels of investment and economic growth. Inflation may also reduce a country's international competitiveness, by making its exports relatively more expensive, thus impacting on the balance of payments. Moreover, inflation can interact with the tax system to distort borrowing and lending decisions. Firms may have to devote more resources to dealing with the effects of inflation (for example, more vigilant monitoring of their competitors' prices to see if any increases are part of a general inflationary trend in the economy or due to more industry specific causes).

In studies by (Dewan et al, 1999) and (Dewan & Hussein, 2001) revealed some insights into the inflation growth relationship. (Dewan et al, 1999) found that changes in the difference between actual GDP and potential GDP (output gap) had a bearing on inflation outcome. In another study, (Dewan & Hussein, 2001) found in a sample of middle-income developing countries including Fiji, that inflation was negatively correlated to growth. The literature survey provided some useful insights into the effects of inflation on growth, including the magnitude.

In (Michael Sarel's paper, 1996), he found a structural break at 8 percent, where after inflation impacted negatively on growth. (Khan and Senhadji, 2001)

found that the threshold inflation levels for industrial and developing countries at 1-3 percent and 11-12 percent respectively. These results amongst others provide useful insights into the relationship between two variables and to determine the advantages of maintaining price stability.

2.1.2.3. Exchange Rate

Aside from factors such as interest rates and inflation, the exchange rate is one of the most important determinants of a country's relative level of economic health. Exchange rates play a vital role in a country's level of trade, which is critical to most every free market economy in the world. For this reason, exchange rates are among the most watched, analyzed and governmentally manipulated economic measures. But exchange rates matter on a smaller scale as well: they impact the real return of an investor's portfolio. Here we look at some of the major forces behind exchange rate movements. A higher currency makes a country's exports more expensive and imports cheaper in foreign markets; a lower currency makes a country's exports cheaper and its imports more expensive in foreign markets. A higher exchange rate can be expected to lower the country's balance of trade, while a lower exchange rate would increase it.

Numerous factors determine exchange rates, and all are related to the trading relationship between two countries. Remember, exchange rates are relative, and are expressed as a comparison of the currencies of two countries. The following are some of the principal determinants of the exchange rate between two countries.

Note that these factors are in no particular order; like many aspects of economics, the relative importance of these factors is subject to much debate. As a general rule, a country with a consistently lower inflation rate exhibits a rising currency value, as its purchasing power increases relative to other currencies. During the last half of the twentieth century, the countries with low inflation included Japan, Germany and Switzerland, while the U.S. and Canada achieved low inflation only later. Those countries with higher inflation typically see depreciation in their currency in relation to the currencies of their trading partners. This is also usually accompanied by higher interest rates.

Interest rates, inflation and exchange rates are all highly correlated. By manipulating interest rates, central banks exert influence over both inflation and exchange rates, and changing interest rates impact inflation and currency values. Higher interest rates offer lenders in an economy a higher return relative to other countries. Therefore, higher interest rates attract foreign capital and cause the exchange rate to rise. The impact of higher interest rates is mitigated, however, if inflation in the country is much higher than in others, or if additional factors serve to drive the currency down. The opposite relationship exists for decreasing interest rates that is, lower interest rates tend to decrease exchange rates.

The exchange rate of the currency in which a portfolio holds the bulk of its investments determines that portfolio's real return. A declining exchange rate obviously decreases the purchasing power of income and capital gains derived from

any returns. Moreover, the exchange rate influences other income factors such as interest rates, inflation and even capital gains from domestic securities. While exchange rates are determined by numerous complex factors that often leave even the most experienced economists flummoxed, investors should still have some understanding of how currency values and exchange rates play an important role in the rate of return on their investments.

2.1.2.4. Import

A raise in imported goods such as oil, or the significant raise in currency exchange rates causes this kind of inflation. The problem starts when a country imports goods from another country that is experiencing an increase in the price of the goods. Coherently, there is going to be a superior increase in price of the goods in the country that imports them. This kind of dilemma is especially problematic for those countries that depend a lot on imported goods. Likewise, a higher exchange rate means a higher conversion price of imported goods.

The effects of inflation could be either positive or negative. Always remember that economic pattern is like a circle, sometimes up, sometimes down. That is why there is always bad and good about it. If the quantity of imports increases, this will reduce domestic demand pull inflation ($AD = C+I+G+X-M$). So a rise in import spending, *ceteris paribus*, reduces consumer spending on domestic goods and so reduces domestic inflationary pressure. However, often a rise in imports occurs because there is a rise in general spending, and the rise in imports

reflects the inflationary pressure in the economy. The other effect is that a rise in imports will *ceteris paribus*; cause depreciation in the exchange rate. This is because domestic firms supply more pounds to be able to buy foreign imports. This rise in the supply of sterling causes depreciation in the pound. Depreciation in the exchange rate tends to increase inflationary pressure because: Imports become more expensive, Exports and AD increase causing demand pull inflation, and firms may have less incentive to cut costs. It is one of those issues where it is impossible to say with certainty exactly what will happen. It depends which effect is bigger – reduction in AD or depreciation in exchange rate. Overall, I would imagine the impact on inflation of higher imports to be negligible.

High of interest rates effect current account deficit by: higher interest rates increase exchange rate worsening current account but, on other hand, higher interest rates reduce consumer spending, reduce imports and improve the current account.

2.2 Literature Review

The evidence strongly suggests that the time series employed to test the relationship between inflation and the money supply lack the stationary properties which would render conventional statistical tests robust. We find that for most countries in our sample, the inflation and monetary growth rates are characterized by deterministic or stochastic trends, indicating that tests of significance based upon conventional methods may be spurious. Whereas (Evans, 1978) found that the time

series (Cagan, 1956) employed in his estimates of the German hyperinflation are non stationary, we show that the problem of data non stationary is general, holding or a large number of countries with a broad range of inflation rates.

Study from “*a model of inflation* by Cooray, Arusha V. (2008)” further indicate that, one of the many explanations for the continuing increase in price level is the monetarist theory of the excessive growth in money supply. The adoption of liberalized trade and payment policies together with the introduction of a floating exchange rate system added further pressure on prices. With the removal of import and exchange controls during the post liberalization period, imports began to gain greater significance in affecting prices Arusha V. Cooray (2008). By 1987, external trade accounted for 57% of the GDP the difference between the 1950’s and post liberalization period being that imports had come to account for a larger share of the GDP than exports. With imports beginning to gain greater importance in price determination, the impact of exchange rate movements on the rate of inflation has also come to acquire greater significance and is therefore included as a likely explanatory variable in the empirical study that follows.

Studies on inflation in this Sri Lanka include those by Nicholas (1990), Nicholas and Yatawara (1991), Weerasekera (1992), Rupananda (1994). These studies suggest the importance of supply side factors as affecting the general level of prices. Hence in estimating a price equation for Sri Lanka, model is examined;

An open economy model which incorporates in addition to the variables in, the import price index and foreign exchange rate.

$$P_t = a_1 + a_2 M_t + a_3 M_{t-1} + a_4 P_{t-1} + a_5 GNP_t + a_6 IMP_t + a_7 ER_t + u_t$$

In study from “*The Quantity Theory of Money: Evidence from the United States* Emerson, Jamie (2006)”, has been founded convincing evidence in support of the quantity theory of money using time series data from the United States for the period 1959-2004. By including an additional decade of information, this study improved upon previous studies that could not find a long-run relationship between money, prices, interest rates, and output for the United States (for example, Miyao (1997)).

This study used the Johansen procedure to estimate the long-run relationship between prices, money, output, and nominal interest rates. Likelihood ratio tests show that, within the framework of this study, the restrictions implied by the quantity theory of money cannot easily be rejected for the entire sample period. However, when considering different sub-periods of the data, there has been mixed evidence concerning the quantity theory of money, particularly in recent decades.

The quantity theory of money identity can be written as

$$P_t + y_t = m_t + v_t, \dots\dots\dots (1)$$

This paper adopts a slightly more sophisticated model of the velocity of money by making the natural logarithm of the velocity of money a function of the nominal interest rate:

$$v_t = \beta_0 + \beta_1 R + e_t, \dots \dots \dots (2)$$

Where β_0 and β_1 are coefficients and e_t is a random error.

Combining (1) and (2) gives

$$P_t = m_t + \beta_0 + \beta_1 R + e_t - y_t \dots \dots \dots (3)$$

Many works treat output and the quantity of money (and their growth rates) as exogenous variables (see for example, Duck (1993)). In that case, we could just estimate (3). However, this paper does not make any initial assumptions about the exogeneity of these variables. Therefore, the following model is of interest:

$$P_t = \beta_0 + \beta_1 R + \beta_2 m_t + \beta_3 y_t + e_t \dots \dots \dots (4)$$

The definitions of the variables are given in the data section of the paper. After estimating the long-run relationship represented by (4), the main implications of the quantity theory of money can be tested. In terms of equation (4), we want to test the joint hypothesis that $\beta_2 = 1$ and $\beta_3 = 1$.

In the study from “*Determinants of Inflation in Nigeria: An Empirical Analysis*” by Fatukasi Bayo (2003)” it was revealed that all explanatory variables (fiscal deficits, money supply, interest and exchange rates) significantly and positively impacted on the rate of inflation in Nigeria during the period under review. Given the nature of the Nigerian economy, very little is still known about the contemporary relationship between inflation and other key macroeconomic variables. The inflation function adopted in this study, therefore, combines the structuralist, monetarist and fiscalist approaches as follows:

$$Dpt = f(FD, DM, IR, EXR) \dots \dots \dots (1)$$

But stated econometrically as:

$$\text{Log } Dpt = b_0 + b_1 \text{Log } FDt + b_2 \text{Log } DMt + b_3 \text{Log } EXRt + Ut \dots \dots \dots (2)$$

Where Dpt = Percentage of inflation rate at period t

FDt = Percentage of fiscal deficits at period t

DMt = Percentage growth rate of money supply (Mt) at period

LRT = Percentage interest rate at period t

$EXRt$ = Percentage of real exchange rate at period t

Ut = Stochastic (error) term

The following linear equation is obtained from the specified model :

$$Dpt = b_0 + b_1 FDt + b_2 DMt + b_3 LRT + b_4 EXRt + Ut \dots \dots \dots (3)$$

b_0 , b_1 , b_2 , b_3 and b_4 are parameters to be estimated while U_1 is the error term. It was expected that increased/higher b_1FD , b_2DM , b_3IR and b_4EXR resulted in high inflationary rules within the period under review.

Thus, the *a priori* expectation becomes $b_1 > 0$, $b_2 > 0$, $b_3 > 0$, $b_4 > 0$. Based on *a priori* therefore, the signs of b_1 , b_2 , b_3 and b_4 are expected to be positive while the sign b_3 is expected to be negative. This is so because, inflationary tendency is expected to increase as fiscal deficits, money supply (M_1), interest rate and exchange rate increase. The normal distribution of the error term is the key

assumption of the model. Based on the findings, it was established that inflation in Nigeria was caused by such dynamic factors as increased deficits, money supply (M1), interest rate, real exchange rate and other factors like population growth rate, activities of the middlemen and monopolistic activities, distribution, bottlenecks, high production costs etc. captured by the stochastic error term.



CHAPTER III

RESEARCH METHODOLOGY

3.1 Research Scope

The research design in this problem uses objective description, which concern about targeting image. The purpose of this writing is explaining the context of the development inflation, money supply, gross domestic product, exchange rate and import in the period from the beginning of reformation era in Indonesia. In this research here used time period 1991-2010 which is one of the government efforts in raise economic growth, to increase the economic growth, Indonesian government has been doing a combination policy in monetary sectors, with a combination policy, had encouraged raising the money supply and increasing the inflation.

Many previous studies found there was a positive or no correlation between CBI and inflation because they use an econometric methodology that does not account for error in the proxies of index. Consequently, the results show spurious estimation. For example Campilo and Miron (1997) and Ismihan and Ozkan (2004) estimate inflation directly on the proxy of CBI using ordinary least square (OLS).

Some information above was gotten with research first with using research methodology which very useful to guide the writer about how to organize the research well. The writer has a generally steps to process of this writing, they are:

Choosing and formulating the problems, determining the purposes of research giving borders as far as research was doing, formulating the theory framework then move in hypothesis form, researching library sources, formulating the hypothesis which will be tested, making analyze to data which have been collected, giving interpretation from the data which have been processed, saving the result of research and giving the suggestion.

3.2 Data Source and Collecting Data Method

The data which uses in this research is secondary data. Money supply data was gotten from Indonesian Central Bank annually report, inflation and money supply data from economics indicator and statistics of Indonesia by BPS, interest rate, exchange rate data, gross domestic product and import from IMF, and from BPS.

In arranging of this writing, the collecting data method uses two things:

1. Library Research, collecting data in library using many literatures, articles, and scientific report that connected with the problems.
2. Field research, collecting data and information through institutes and government institutions which correlated with this writing.

Table 3.2

The Indicators and Data Sources

Data	Data Sources	Collecting Data
The Inflation Rate (%)	Central Bank of Indonesia	Indirect
Money Supply (Billion Rupiah)	Central Bank of Indonesia	Indirect
Gross Domestic Product (Trillion Rupiah)	Central Bank of Indonesia and Ministry of Trade and Industry	Indirect
Exchange Rate (Rupiah)	Central Bureau of Statistic	Indirect
Import (Billion Rupiah)	International of Monetary Fund, and Central Bureau of Statistic	Indirect

3.3 Analyzing Method and Methodology and Model analysis

3.3.1. Analyzing Method and Methodology

The approach that used to this research is a regression analysis using Ordinary Least Squares (OLS). OLS method was chosen because it is relative efficient in analysis models of panel data.

To analyze the inflation, and other macroeconomics indicators such as money supply, interest rate, exchange rate, gross domestic product and import in Indonesia.

There are three methods to analyze panel data. Based on Verbeek (2000:313-19):

1. Method is pool least square (PLS) where this method pooled all of time series and cross section data and then uses OLS to estimate.

$$Y_{it} = \beta_1 + \beta_2 + \beta_3 X_{3it} + \dots + \beta_n X_{nit} + u_{it}$$

2. Fixed-effects models allow for unobserved or misspecified factors that simultaneously explain trade volume between two countries. Gravity models with fixed effects have also been used by Glick and Rose (2001). The purpose of this as the solution to unobserved heterogeneity, because several papers have argued that standard cross sectional methods yield biased result because they do not control for heterogeneous trading relationship. This

method also adds dummy variables to allow the changes of this intercept.

Usually, this method use general least square as the estimate method.

$$Y_{it} = \alpha_1 + \alpha_2 D_2 + \dots + \alpha_n D_n + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + u_{it}$$

3. Random effect method to fix the efficiency of least square which is calculates the error of cross section and time series. This model use general least square (GLS).

The model of panel data based on the method (Gujarati, 2003):

$$Y_{it} = \beta_1 + \beta_2 X_{2it} + \dots + \beta_n X_{nit} + \varepsilon_{it} + u_{it}$$

3.3.2 Model Analysis

The model The variables that uses are indicators of money supply, interest rate, exchange rate, gross domestic product, and import as independent variable, and inflation rate as dependent variable that can imply below, which adapted the model from Fatukasi Bayo (2003) This model attempts to analyze the main factors influencing the rate of inflation in Nigeria.

The inflation function adopted in this study, therefore, combines the structuralism, monetarist and fiscal approaches as follows:

$$Dpt = f(FD, DM, IR, EXR) \dots \dots \dots (1)$$

But stated econometrically as:

$$\text{Log } DPt = b_0 + b_1 \text{ Log } FDt + \text{log } DMt + \text{log } EXRt + Ut \dots \dots \dots (2)$$

Where:

D_{pt} = Percentage of inflation rate at period t .

FD_t = Percentage of fiscal deficits at period t

DM_t = Percentage growth rate of money supply (M_t) at period t .

LRT = Percentage interest rate at period t .

EXR_t = Percentage of real exchange rate at period t

U_t = Stochastic (error) term

In order to determine the best specification, diagnostic tests have been carried out the models appear to be well specified on the basis of these tests. The J test from Davidson and MacKinnon (1981) and JA test from Fisher and McAleer have been used to compare the alternative specifications. It suggests that the open economy price equation performs better for all three data sets. After checking whether the model is linear or log-linear, we need to check stationary of each variable The ADF, Augmented Dickey Fuller test for unit roots has been employed to detect the presence of unit roots. If the variables are not stationary at the level or it will be stationary at different levels then continue by co-integration test, it will be used to apply the OLS. Having established the time series properties of the variables, co integration tests have been carried out to examine the existence of a long run relationship between the variables.

Based on model from *Fatukasi Bayo* (2003) the model of this research attempts to analyze the main factors influencing the rate of inflation in Indonesia:

$$Pt = X1 + X2 Mt + X3 GDPt + X4 IMt + X5 ERt + ut$$

Where;

Pt = Inflation Rate

Mt = Money supply (M2)

$GDPt$ = Real Gross Domestic Product

IMt = Import Value index

ERt = Official exchange rate Rupiah/US Dollar

$X1, X2, X3, X4, X5, X6$ = Regression Coefficient

ut = Error variable

3.4 Testing Procedure

To Test regression result, used some statistical test method. Coefficient determination is used to measure the tight of correlation between independent variable and dependent variable as below (Gujarati, 1998) :

$$R^2 = \frac{ESS}{TSS}$$

where:

R^2 = Coefficient of determination

ESS = The average of regression power

TSS = Total amount of power

To investigate whether each indicators have correlation or not, used t-test as below:

$$t_{test} = \frac{bi}{Se(bi)} \quad ; bi = b_1 \text{ and } b_2$$

where:

t= the value of t is counted

bi= elasticity from interest rate, money supply and unemployment rate and inflation rate

Se= standard error

To test uses hypothesis as below:

Ho : $bi = 0$ = there is no correlation between independent variable and dependent variable

Ha : $bi \neq 0$ = there is correlation between independent variable and dependent variable
Zero Hypothesis (Ho) is hypothesis that said there is no influence between independent variable to dependent variable, while

Alternative Hypothesis (H_a) is hypothesis that said there is a connection between independent variable and dependent variable.

3.4.1 T-Test

T-test is a test, that have purpose to know each of the regression coefficient significant or not. Before do the test, first we have to set our hypothesis:

$$H_0: \beta = 0$$

$$H_a: \beta \neq 0$$

So, based on data, value of β will be tested, if $\beta = 0$ it means that coefficient of dependent does not have significant effect with independent variable. If $\beta \neq 0$ it means that coefficient of dependent have significant effect with independent variable. T-test:

$$\{T\text{-test}\} = \frac{\hat{\beta}_j}{SE(\hat{\beta}_j)}$$

$$\{T\text{-table}\} = \{\alpha; df = (n - k)\}$$

The testing was done by compared of t-count value which was gotten with t-table that the determinate as below:

If $t\text{-count} < t\text{-table}$ so H_0 will be accepted and H_a will be rejected, it means there is no significant correlation between independent variable and dependent variable.

If $t\text{-count} > t\text{-table}$ so H_0 will be rejected and H_a will be accepted, it means there is a significant correlation between independent variable and dependent variable.

3.4.2 F-Test

F-test is commonly used as a test of the overall significance of the included independent variables in a regression model. First step we have to do is create hypothesis:

H_0 = independent variable have no significant effect to the dependent variable

H_a = independent variable significantly affect to the dependent variable

$$F - test = \frac{R^2 / (k - 1)}{(1 - R^2) / (n - k)}$$

R^2 = determination coefficient

k = independent variable

n = total sample

$$F\text{-table} = \{\alpha; df_1 = (n - 1); df_2 = (n - k - 1)\}$$

$H_0 : b_i = 0$, there is no correlation between independent variable and dependent variable

$H_a : b_i \neq 0$, there is a correlation between independent variable and dependent variable

The decision theorem as:

If $F\text{-counted} < F\text{-table}$, so H_0 will be accepted, and H_a will be rejected, it means there is no significant correlation between independent variable and dependent variable

If $F\text{-counted} > F\text{-table}$, so H_0 will be rejected and H_a will be accepted, it means there is a significant correlation between independent variable and dependent variable.

3.4.3. R-Squared (R^2)

R-Squared is a statistical term saying how good one term is at predicting another. If R-Squared is 1.0 then given the value of one term, we can perfectly predict the value of another term. If R-Squared is 0.0 then knowing one term doesn't help us know the other term at all. More generally, a higher value of R-Squared means that we can better predict one term from another.

Or we can say R-Squared is the square of the correlation coefficient between the dependent variable and the estimate of it produced by the regressors, or equivalently defined as the ratio of regression variance to total variance.

3.4.4. Multicollinearity

Multicollinearity is an existence of a perfect (nearly exact) linear relationship between independent variables in the model. There are some methods to detect multicollinearity:

- Multicollinearity happens when there is high R squared and significant F statistic in the regression, but some t statistic appears to be statistically not significant.
- If correlation between variables exceeds 0.89, multicollinearity appears in regression.

3.4.5 Autocorrelation

Autocorrelation is a correlation at errors from different periods. Term used in the statistical measurement of relationships within a series. It is one of the assumptions required in a regression in order to make it reliable, also called serial correlation. It means that the error terms are independent of each other. That is, the deviation of one point about the line (i.e, the error= $y-y'$) is unrelated to the deviation of any other point. When autocorrelation exists, the standard errors of the regression coefficients are seriously underestimated. The problem of autocorrelation is usually detected by the Durbin-Watson statistic. Testing method that often used is by Durbin-Watson test (DW test) with the following conditions:

- a) If d is smaller than d_L or greater than $(4-d_L)$ then the null hypothesis is rejected, which means there is autocorrelation.
- b) If d lies between d_U and $(4-d_U)$, the null hypothesis is accepted, which means there is no autocorrelation.
- c) If d lies between d_L and d_U or in between $(4-d_U)$ and $(4-d_L)$, it does not produce definitive conclusions.

3.4.6. Heteroscedastisity Test

Heterocedastity is a state where the residual variance from one observation to another observation occurred inequality (various). The occurrence of this phenomenon as a result of the inequality data and too varied data values examined. Heterocedastity will often encounter in cross section data. Time series data rarely contain elements heterocedastity, because in the residual time series data is expected to relate to each other between one observation with other observations (autocorrelation). Methods for detecting the presence or absence heterocedastity problem can be done informally or formally. We can use White's method without cross term (white heterocedasticity no cross term) to test the heteroscedasticity problem.

2. If the probability value of Chi-Squares on White's test results without cross terms greater $\alpha = 5\%$, it can be said that the model equation is not affected regression heterocedastity. There are several testing methods that can be used such as the Park Test, Test Glesjer, Seeing Patterns Regression Graphics, and Spearman Correlation Coefficient Test.

CHAPTER IV

OVERVIEW ECONOMIC CONDITION OF INDONESIA

4.1 Development of Inflation in Indonesia

Economic condition in Indonesia has been fluctuating, furthermore in inflation or consumer price index. The inflation rate is the macroeconomic variables of the most important because it directly affects the production cost and structure welfare level. Considered in long term period since independence, the government efforts to keep stability of currency have toward to better course. Prof. M. Sadli, (2005) said that, "Inflation in Indonesia was very high in President Soekarno era, because fiscal policy and monetary was not prudent (if need money, just formed and published). In Soeharto era, government try to push inflation but couldn't under 10% a year average, because Indonesian Bank still has a fold mission, as agent of development that can flow liquidity credit unlimited, in the reformation era, began in President Habibie era, the function of Indonesian Central Bank give priority the security of value of rupiah. In 1990s, Soeharto's government actually have able to keep inflation rate average under 10%, but when entered monetary crisis Indonesia and Asia 1997, Inflation was 6,23% and jumped drastically to be 58,39% in 1998. After all Habibie's government did monetary policy very tight and resulted the lowest level of inflation that have ever reached, it was 3,72%. Next in 2000 until 2006, inflation happened with the high level, it was about 10%.

Based on figure above can be seen development of inflation rate in Indonesia as long as period 1991-2010. In 1991 inflation was 9,41%, in 1992 decrease to be 7,53%. In 1997 inflation was 6,23% and in 1998 increase to be 58,39% was the highest inflation rate in Indonesia that was happening because Indonesia had an economic crisis, which affected inflation rate becomes the highest in period in two digits position, Arifin (1998). In efforts to decrease inflation that occurred since 1998, government took a monetary policy through tight monetary policy in interest rate instrument with increased of interest rate, demand of credit decrease so that money supply decreased and people interest to saving money in the bank increased, so that inflation decreased that policy indirectly saw soon because needed time lag, Sukendar (2000).

The rate of inflation during 2001 showed a trend which tends to increase. However, at the end of quarter of 2001, the political and social conditions of international security experienced shocks with WTC and Pentagon attacks this also affects the national economy was under pressure because of the uncertainty of U.S. bilateral relations increasing rate of inflation at the end of 2001 up to 11,50%.

The appreciation of rupiah was one of the fundamental factors that pushed the inflation rate down during 2003. Inflation rate fell to 6,59%. Other fundamental factors contributing to the low inflation were lower inflationary expectations and limited pressure arising from output gap. The higher economic growth in 2004 was

achieved with macroeconomic stability being kept in check. Inflation did rise to 6,24%, yet it was still within the target range. Following the fuel price hikes in October 2005, Inflation rise again at last quarter at year 2005 reach 10,45%. But the strengthened coordination between Bank Indonesia and the government has already lowered inflation expectations. Furthermore, declining inflationary pressure was also supported by stable rupiah throughout 2006. Besides that, minimal adjustment to administered prices and weaker people's purchasing power also contributed to the easing inflationary pressure. Lower inflation in mid-2006 made Bank Indonesia toward lower the interest rate gradually BI rate this was a positive response to increase consumer confidence levels. There are several factors that affect the fluctuation of inflation, namely increased money supply, pressure on the general level of prices, government policies that encourage activities of non-oil exports, increased growth of aggregate demand.

Increasing of inflation also occurred in the year from 2007 to 2008 were caused by the global economic crisis which hit almost the entire State. CPI reached its highest level up and still in its number for following months. The same thing happened in the year 2005, cumulatively in the increase of inflation due to rising oil prices followed by rising inflation. Inflation became a major concern for the Indonesian economy in 2008. However, in 2009 and 2010, inflation in Indonesia is relatively stable due to the shock of the global crisis is not very big impact and this situation persisted until the end of the year.

4.2 Development of Money Supply in Indonesia

Money supply is one of determinant factor in influence of economic growth and inflation. Most of these countries have devoted much attention to develop their financial system. They have persistently implemented policies designed to expand their banking system and to accelerate domestic fund mobilization to promote economic growth.

Figure 4.2 Money Supply of Indonesia 1991-2010 (Billion Rupiah)



Source: Statistik Ekonomi dan Keuangan Indonesia, Bank Indonesia

In 1991, monetary policy increase slow down the growth of money supply, it can be seen from the slowdown of monetary base. Hence, rate growth of money (M2) slow from 34919.76 (billion rupiah) in 1991 to 40456.44in 1992.

Main factor causing slow of rate growth of money supply was slow of bank credit expansion. The goals of monetary policy in Indonesia since the beginning of the Soeharto government until the currency crisis in July 1997 were designed to achieve multiple objectives, including price and exchange rate stability and economic growth. The monetary policy was conducted through controlling monetary aggregates money supply under a fixed or a managed floating exchange rate arrangement.

In 2002, the M2 still increased although it grew more leisurely than 2001. M2 increases to 42554.40 billion. During 2003, the M2 still experienced improvement. Through the evaluation from growth side, M2 showed slow growth rate. At the end of 2003, M2 reached 71190.65 billion. While increasing of M2 is triggered by an increase in quasi money. At the end of 2004 it can be seen an increase in M2 amounted to 78314.70 because of an increase in currency and demand deposits.

During the year 2006, money supply had increased quite high. The increase was derived from the increase of quasi money, namely savings and deposits. In the early 2006, was 134758.80 billion. The increasing of M2 was contributed by the increasing in credit in the world and domestic stock, net of increasing in the claim of government and increasing in of net foreign assets. In December 2007, the value of M2, this is caused by external and internal factors. In 2007 M2 value was 175960.99 billion. Factor domestic credit increased due to an increasing in business

and external sectors by occurrence of foreign exchange increased due to higher world oil price. But since monetary crisis, the authority in Indonesia had had a single objective in maintaining exchange rate stability. After the crisis, Indonesia had also moved from managed floating exchange rate system to free floating exchange rate system. Movements of board money supply during free floating exchange rate system to 2007 showed that the growth rate of narrow money was smaller than the previous period.

In 2008-2010, M2 had continued to rise. This is due to improvement in the Indonesian economy are less affected by the global financial crisis and the Indonesian economy that continues growing.

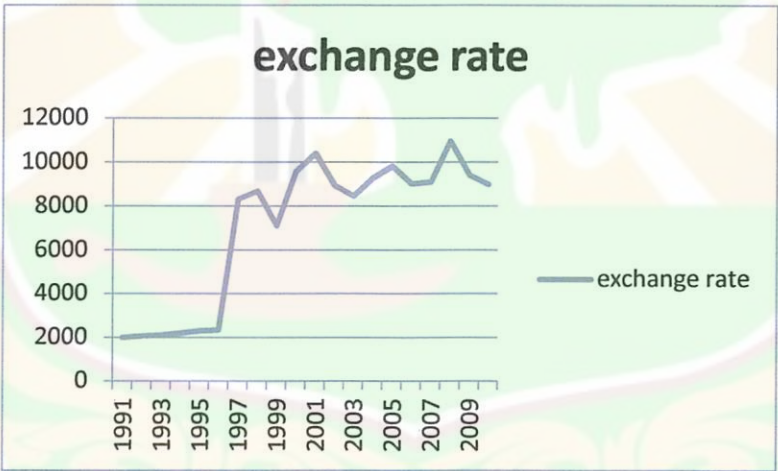
4.3 Development of Exchange Rate in Indonesia

The currency of Indonesia is Indonesian Rupiah (Rp). The Bank Indonesia (BI) administered all foreign exchange and trade controls in cooperation with the Ministry of Finance, the Ministry of Trade and Cooperatives, authorized banks and the customs authorities. In the early 70's, Indonesia adopted a simplified multiple exchange rate structure, including a Flexible General Exchange (DU) Rate, a Flexible Credit Foreign Exchange (DK) Rate and Export Rate. During this period, the floating of U.S. Dollar led to the continuing devaluation of the Rupiah and reduction of gold content. Therefore, in November 1978, the Bank Indonesia abolished the DK Rate and introduced an Effective Rate on a controlled, floating basis. One of the variables to determine the external value of Rupiah was a basket of

currencies of Indonesia's main trading partners. This exchange policy did not help much. However, the BI insisted to adopt the managed float policy and considered a wider range of currencies in 1983. Until 1989, the Bank Indonesia revised the exchange rate system. An Interbank Free Rate, which was determined between banks, governed all transactions. In August 1997, the managed floating exchange regime was replaced by a free-floating exchange rate arrangement.

Figure 4.3 Exchange Rates in Indonesia 1991-2010 (Rupiah)

Source: Statistik Ekonomi dan Keuangan Indonesia, Bank Indonesia



In 1991-1996, the value of exchange rate in USD to Rp tended to stable, Rp1.992 in 1991 to Rp 2.342 in 1996, then in the middle of 1997-1998 increased become Rp 8.685, it happened because stock of goods decreased rapidly because production activity decreased too and distribution strip was disrupted by destroyed

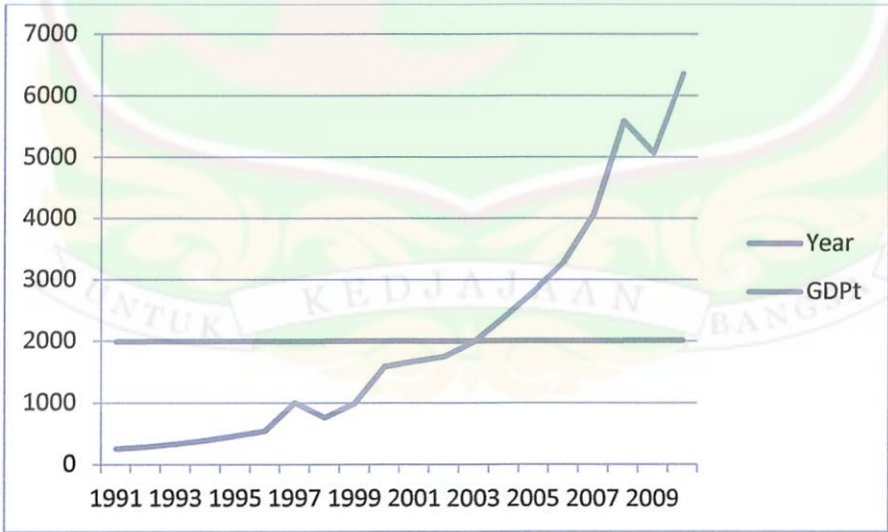
of trading central in May's riot 1998, with crisis rupiah exchange rate to USD which happened in the middle of 1997 caused the crisis of credence people to Rupiah, Banking, and government o solved the crisis. Monetary policy in this period purposed to hold speculation foreign exchange and keep reserve foreign exchange. In 2003, the value of exchange rate tough was Rp 8.465, and in 2005 weak became Rp 9.830, that was logical consequences from government economy policy that keep foreign exchange regime free and floated a rate of exchange of Rupiah buried because external factor, that was increased of interest rate to FED in U.S and internal factor, such as APBN that incapable to hold subsidize of BBM, so market agent and investor appraised invest in Indonesia had a risk and the value of exchange rate had been fluctuated year a year until 2010.

4.4 Development of Gross Domestic Product in Indonesia

Economic growth is a process where real GDP or real national saving increased, where if economic growth raises, so real output will raise too, because Gross Domestic Product is reflection of economic activity, Mankiw (2003). Indonesia's overall macroeconomic picture is stable. By 2004, real GDP per capita returned to pre-financial crisis levels and income levels are rising. In 2009, domestic consumption continued to account for the largest portion of GDP, at 5.06% followed by investment at 31.0%, government consumption at 9.6%, and net exports at 2.8%%. Investment realization had climbed in each of the past several years, until the global slow down in 2009. It is again rebounding in 2010.

Following a significant run-up in global energy prices in 2007-2008, the Indonesian Government raised fuel prices by an average of 29% on May 24, 2008 in an effort to reduce its fuel subsidy burden. Fuel subsidies had been projected to reach Rp 265 trillion (\$29.4 billion) in 2008, or 5.58% of GDP. The fuel price hikes, along with rising food prices, led consumer price inflation to a peak of 12.1% in September 2008. To help its citizens cope with higher fuel and food prices, the Indonesian Government implemented a direct cash compensation package for low-income families through February 2009 and an extra range of benefits including an expanded subsidized rice program and additional subsidies aimed at increasing food production. Subsequent declines in oil and gas prices allowed the government to reduce the prices for subsidized diesel and gasoline, but with oil and gas prices recovering, the energy subsidy bill has again swelled in 2010.

Figure 4.4 Real GDP in Indonesia 1991-2010 (Trillion Rupiah)



Source: Badan Pusat Statistik Indonesia

The rate of economic growth in Indonesia had been fluctuated, especially before 2001, economic growth 4,7% and 1997 GDP was 1,002%. In 1998 economic crisis, Indonesia had negative growth with GDP was 0,76%. in 1999 was 0.99%. Especially since 2001 had a mainstream in increased economic growth with GDP was 1.66%. In 1997, Indonesia had Asia financial crisis began with depreciation of Thai (Baht). Investor difficult to extended the infestation. In 1998, president election process was the serious point of Indonesian economic which would awareness and attention of investor. From 2001, Indonesian economic had been increased. Amid the ongoing adjustment of global economic imbalances and declining purchasing power after the rise in fuel prices in October 2005, the Indonesian economy in 2006 gradually improve. The inflation rate is very high in early 2006 eased and the rupiah exchange rate becomes stable with a tendency to be appreciated. Maintained macroeconomic stability in turn gives the economy room to grow with the trend of improved so that for the whole year 2006 reached 5.5%.

Indonesia's economy in 2007 recorded some of the principal achievements of exciting though under pressure mainly from the external side. For the first time since the crisis, Indonesia's economic growth is above 6% with the highest GDP of 4.06% with stability is maintained. Indonesia recorded a surplus balance of payments, international reserves increased, the exchange rate strengthens, and credit growth and inflation exceeded the target in accordance with the target set.

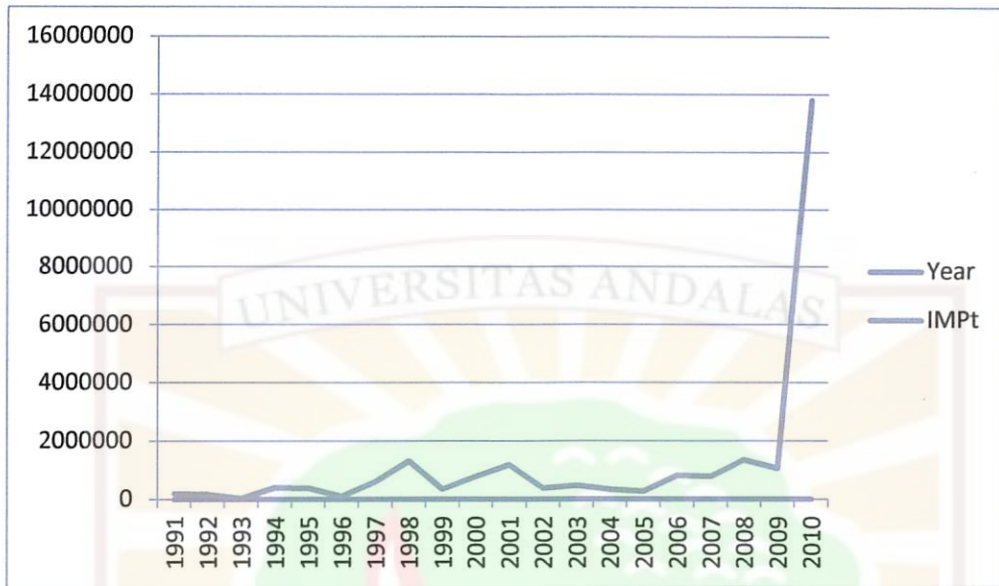
And in next year's, GDP growth for each year is relatively stable. But there are very large decline in 2010. The fall in the value of GDP is more than half of GDP in the previous year. In 2010 the growth of GDP was 6.35% while the previous GDP in 2009 was 5.06%. This was triggered by a number of economic problems that occurred in Indonesia, one year later.

4.5 Development of Import in Indonesia

Indonesia still dominates in the field of production, consumption and world goods trade. Production goods of Indonesian take share of approximately 9% of total world production. Indonesia is the third largest country in the world of producing raw goods, after China (30%) and India (21%). However, the last two countries are net exporters, unlike Indonesia which becoming a net importer country of raw goods since the late 1980s.

Indonesia encourages continuously to increased domestic goods production and manages the national goods stock for emergency purpose and price stabilization. Production material, such as rice/paddy in the country is very important to avoid the high risk of price volatility and supply of rice from the world market, as well as closely related to poverty eradication and rural development.

Table 4.5 Import in Indonesia 1991-2010 (Billion Rupiah)



Source: Badan Pusat Statistik Indonesia

Indonesia has become a net importer of goods for a long time. In the period 1997-1998, a decline in goods production that coincides with the economic crisis, which causes goods imports, reached 6,10 (billion rupiah) with growth was 61.02%. However, imports declined dramatically in the period 1998, since Indonesia had an economic crisis, and other country not interested to export from Indonesia. But since 2005 import of goods had been increased year a year.

The value of Indonesian imports in 2006 decreased 8.12 (billion rupiah) with growth was 81.22% compared to 2005 imports from 2.72% with growth was 27.23 %, this was caused by a decrease in oil and non-oil imports amounted to U.S.\$ 248.8 million (12.94%) and U.S.\$ 914.2 million (24.48 %). Further decline in oil imports caused by a decrease in imports of oil products amounted to US\$ 284

million (23.30%), although crude oil imports slightly increased in US\$ 31.2 million (4.44%).

The policy to increase production and maintain reserve-stock goods, still pursued by many Asian countries, both developed countries like Japan and South Korea, and developing countries, such as the Philippines and Bangladesh. For the net exporter country such as Thailand, Vietnam, and India will do the same policy with the net importers countries such as Indonesia, Philippines and Sri Lanka.



CHAPTER V

EMPIRICAL RESULT AND ANALYSIS

5.1. Empirical Results

5.1.1. Regression Result Analysis

This study aims to examine the inflation and the relationship between macroeconomics indicators or factors that influence of inflation in Indonesia. Data that used in this research is secondary data. More specific, writer used time series data. It takes from 1991-2010. The data contains by; the economic growth data, since this data is the macroeconomics indicators. For the data, writer uses inflation as dependent indicators and money supply, gross domestic product, exchange rate, and import as independent indicators.

Writer uses Microsoft Excel and Eviews 6 to proceed of analyze the data are by regress the data using the computer program which is competent and representative with the research. The computer program used by the writer is EVIEWS 6.0 in order to make the data estimation easier. The EVIEWS computer program also helps to avoid computing error. The regression result of Ordinary Least Square (OLS) model is shown in table.



Based on analysis which was gotten from *Fatukasi Bayo* (2003) where attempts to analyze the main factors influencing the rate of inflation can be analyzed as below:

$$Pt = x1 + x2 Mt + x3 GDPt + x4 IMPt + x5 ERt + ut$$

The regression result from the model of analysis can be simplified as below

$$Pt = 6.27 + 9.35Mt + 0.001GDPt + 9.35IMPt - 0.0004ERt + ut$$

$$T\text{-test } (1.82) \quad (6.07) \quad (1.04) \quad (0.14) \quad (-0.68)$$

$$R\text{-Squared} = 0.76$$

$$\text{Adjusted } R\text{-Squared} = 0.70$$

$$\text{Durbin-Watson stat} = 2.45$$

$$F\text{-Statistic} = 12.26$$

From the regression equation above, we can analyze that, the coefficient of determination test is intended to measure the affect of changes in the independent variables used in the model is able to explain its influence on the independent variable. These test look at the value of the coefficient of determination R^2 of the equation in the reggresion. The value of R^2 from the model is 0.76 means that 76% the inflation rate for a future periode is influenced by determinant variables in the model, while the remaining as amount of 0.24 influenced by other variables outside the model.

5.1.2. T-Test

The t-test is used to test the correlation between the dependent variable and independent variables individually. From the regression result, it shows that the computed t value of each independent variable is compared with the value of the computed t table. The way to find the critical t value is: $T_{table} = t_{\alpha, df(n-k)}$, where: α is level of significance, degree of freedom (df) is 15, using 20 number of data and 6 number of parameters. By using t-test analysis at definite degree of freedom, the significant correlation between dependent and independent variables can be determined.

T-Test Table 5.1.2

Variables	T-statistic	Ho	Explanation	T-Test	Hypothesis
Exchange Rate	-0.683347	Rejected	Significant at $\alpha = 5 \%$	One tail negative	proven
Gross Domestic Product	1.045282	Rejected	Significant at $\alpha = 5 \%$	One tail negative	proven
Money Supply (M2)	6.072555	Rejected	Significant at $\alpha = 5 \%$	One tail negative	proven
Import	0.144387	Rejected	Significant at $\alpha = 5 \%$	One tail negative	proven

5.1.2.1 T-Test on Exchange Rate

$$H_o : \beta_i = 0$$

$$H_a : \beta_i > 0$$

Computed t value is -0.68, critical t value with $\alpha = 5\%$ and $df = 15$ is 1.753 with one tail-negative test. After observing the result above, it can be analyze that the

computed t value has a negative sign which is the same as the sign of its hypothesis, and the value is higher than the critical t value, so H_0 is rejected or H_a is accepted statistically. It means that the exchange rate has a significant and negative effect to inflation in Indonesia. In other words, there is a negative relationship between independent and dependent variables.

5.1.2.2 T-Test on GDP

$$H_0 : \beta_i = 0$$

$$H_a : \beta_i < 0$$

Computed t value is 1.04, critical t value with $\alpha = 5\%$ and $df = 15$ is 1.753 with one tail-negative test. After observing the result above, it can be that the computed t value is greater than critical t value, so H_0 is rejected or H_a is accepted statistically. It means that GDP has a positive and significant effect on the Inflation in Indonesia. In other words, there is a positive relationship between independent and dependent variables.

5.1.2.3 T-Test on Money Supply

$$H_0 : \beta_i = 0$$

$$H_a : \beta_i \neq 0$$

Computed t value is 6.07. Critical t value with $\alpha = 5\%$ and $df = 15$ is 1.753 with one tail-positive test. After observing the result above, it can be concluded that the computed t value is greater than critical t value, so H_0 is rejected or H_a is accepted

statistically. It means that Indonesia money supply has a positive and significant effect of inflation in Indonesia. In other words, there is a positive relationship between independent and dependent variables.

5.1.2.4 T-Test on Import

$$H_o : \beta_1 = 0$$

$$H_a : \beta_1 < 0$$

Computed t value is 0.14, critical t value with $\alpha = 5\%$ and $df = 15$ is 1.753 with one tail-negative test. After observing the result above, it can be analyze that the computed t value has a negative sign which is the same as the sign of it hypothesis, and the value is higher than the critical t value, so H_o is rejected or H_a is accepted statistically. It means that the import has a significant and negative effect to inflation in Indonesia. In other words, there is a negative relationship between independent and dependent variables.

5.1.3. F-Test

F test is used to detect the correlation between dependent variable and all the independent variables (simultaneously). The using of F test is similar as the using for t test. Hypotheses are formulated as follows:

This decision will use parameter at 5% ($\alpha = 5\%$) based on the following rules:

- a. If F-statistic < F-table

H_o is accepted and H_a is rejected, the independent variables simultaneously do not have any effect on the dependent variable.

b. If $F\text{-statistic} > F\text{-table}$

H_0 is rejected and H_a is accepted, the independent variables simultaneously have effect on the dependent variable.

The F test is similar to the t test that comparing the value of the computed value and the table value (critical F value). To find the critical F value, we must get the degree of freedom for numerator ($k-1$) and the degree of freedom for denominator ($n-k$). With the level of significance $\alpha = 5\%$, the degree of freedom for numerator is $4 = (5-1)$ and the degree of freedom for denominator is $15 = (20-5)$. It can be found that value of F table in point (4:15) is 3.06.

The Comparison Value of F-Statistic and F-Table Table 5.1.3

F-Statistic	α	F-Table	Result
12.26383	5%	3.06	Significant

It is already known that F value from the regression is 12.26. We proceed to compare the computed F value and critical F value. From the comparison, it can be concluded that the computed F value is higher than the critical F value. It means that H_0 is rejected and H_a is accepted. The independent variables simultaneously have effect on dependent variable. In

other words, the exchange rate, money supply, import price and Indonesia GDP, significantly and simultaneously have effect on inflation in Indonesia.

5.2. Classical Assumption Test

5.2.1. R-Squared (R^2)

From the regression done by the writer, the value of coefficient of determination (R^2) is 0,76. This value shows a high measurement for the independent variables to explain their effect on the dependent variable in the model. It means that the variation of the dependent variable can be explained by the independent variables about 76.5 %, when the rest 23.5 % are explained by factors outside the model.

5.2.2. Multicollinearity

To detect multicollinearity within the regression model, we can observe from coefficient correlation (r) between independent variables. If the value of coefficient correlation of each independent variable is less than 0.89, it means the model is free from multicollinearity. But if the value of coefficient correlation is greater than 0.89, it assumes strong correlation among independent variables or the model detects multicollinearity on it. But multicollinearity result can be ignored since the value of R^2 is greater than those correlation independent values. According to the result of the data above, $r < 0.89$, it means that there is no multicollinearity on the model.

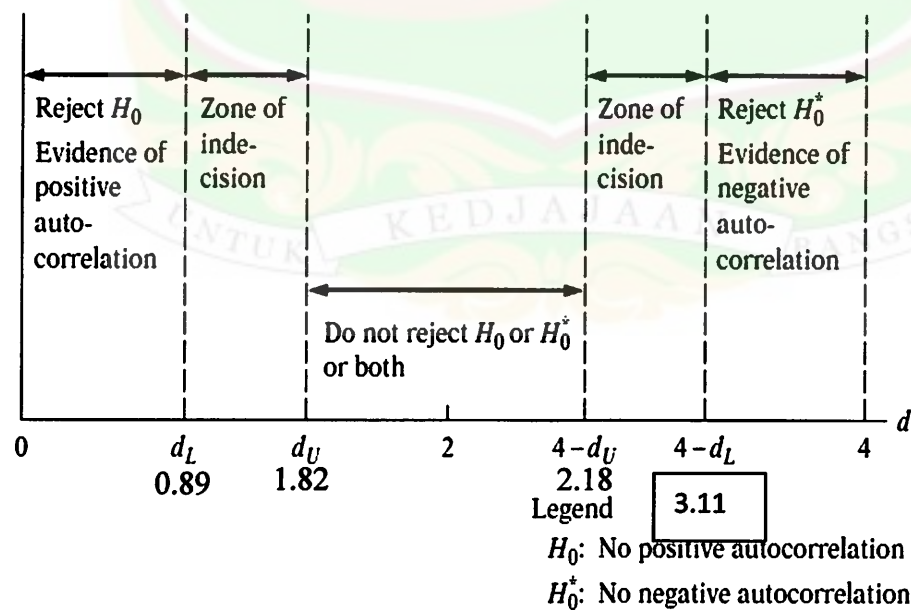
Multicollinearity Test Table 5.2.2

	MT	ERT	GDPT	IMT
MT	0.100000	-0.188992	0.100517	-0.143249
ERT	-0.188992	0.100000	0.677618	0.651084
GDPT	0.100517	0.677618	0.100000	0.650929
IMT	-0.143249	0.651084	0.650929	0.100000

5.2.3. Autocorrelation Test

Autocorrelation means that there is correlation between one intercept and the others. In this case, to know any indication of autocorrelation problem, able to use Durbin Watson tests. Estimation result show, the value of D-W statistic is 1.15.

Table 5.2 Autocorrelation



Based on D-W *d* Stat figure above, from analysis result of D-W for 2.45 it is located on $4-dU \leq d < 4-dL$ or between 2.18 (4-dU) of lower border and 3.11 (4-dL) of upper border. In other words, the value analysis of D-W is indecision.

So we can use another way to find indication of autocorrelation within a model, called *Breusch-Godfrey Method* or *Lagran Multiplier Test*. Through this method, we can have a look to the value of Chi-Squares probability. If the value is greater than 5%, it means there is no indication of autocorrelation.

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	4.461465	Prob. F(2,13)	0.0335
Obs*R-squared	8.140272	Prob. Chi-Square(2)	0.1171

In this research, the value of Prob. Chi-square test is 0.11, which absolutely greater than 5%. It means there is no autocorrelation.

5.2.4. Heteroscedasticity Test

Heteroscedasticity appears if the error or residual of the observed model does not have a constant variance of one observation to another observation. Heteroscedasticity situation occurred because of several reasons, among others:

- a. The nature of the variables included into the model.
- b. The nature of the data used in the analysis, cross section data more often creating heteroscedasticity compared with time series data.

Heteroscedasticity Test Table 5.2.4

Heteroskedasticity Test: White			
F-statistic	0.982774	Prob. F(4,15)	0.4463
Obs*R-squared	4.153058	Prob. Chi-Square(4)	0.3857
Scaled explained SS	3.647349	Prob. Chi-Square(4)	0.4558

In this research to detect Heteroscedasticity problem on regression equation we use white Heteroscedasticity without cross term method. If the value of Chi-square is greater than 5%, indicate there is no Heteroscedasticity on regression equation model. From estimation result, writer got the value of Chi-squares probability for 0.38, which is greater than 5%. It means there is no Heteroscedasticity problem on regress equation model.

5.3. Estimation Result

5.3.1 The Influence of Money Supply Toward The Inflation Rate

Coefficient value of 9.35 means that the variables in the money supply has positive relationship with the variable inflation rate, the regression results show that increasing the money supply in the sense of money (M2) for this time periode significantly affect the rising rate of inflation at a future periode. If there is an

increase in changes in the money supply in 100%, *ceteris paribus* the the inflation rate will increase 9.35% at 90% confidence level, and the value shows that when the money supply increases in 1% inflation rate will increase in 9.35%. The direction of this coefficient according to the theory that the expansion of the money supply will increase.

5.3.2. The Influence of Gross Domestic Product Toward The Inflation Rate

Regression coefficient for GDP is 0.001. It means the real output positive and significant inflation rate. The regression results show that at each increase of real GDP in 10%, *ceteris paribus* will cause increasing in the inflation rate at 0.001 % at 99% level, and the value shows that when the GDP increases in 1% inflation rate will increase in 0.001%. This situation is appropriate with the theory of measurement of real output, then the cause of the inflation that occurs that the demand pull inflation, when the aggregate demand increases, then the output will increase, and raising the price and inflation rate.

5.3.3. The Influence of Exchange Rate Toward The Inflation Rate

Coefficient value of -0.0004 means that the independent variable interest rate has negative relationship with the dependent variable inflation rate, the regression result indicate that the decline in exchange rate will increase the rate of inflation in 0.04 *ceteris paribus*, and The value shows that when the exchange rate increases (depreciate) in 1% inflation rate will decrease in 0.04%. This situation is suitable with the monetarist theory that inflation is a monetary phenomenon, so the

cause of inflation is one of them is the money supply, so as control inflation by regulating the money supply, so any decrease in exchange rates would increase the amount of money in circulation which in turn will increase the aggregate price.

5.3.4. The Influence Import Toward The Inflation Rate

Coefficient value of 9.45 means that the independent variable of volume of import price has negative relationship with dependent variable inflation rate. The regression results show that at each increase of the volume of international trade, *ceteris paribus* will decrease the inflation rate at 99% confidence level, and the value shows that when the import increases in 1% inflation rate will decrease in 9.45%. This results is appropriate with the liquidity preferences framework, any increase in the volume of import price will increase the demand for money for the transaction so the money demand curve will shift to the right, it will decrease the inflation rate.

From the hypothesis, it can be seen all variables have dependability or relevance and have contributions in influence of inflation about 80%, in fact money supply, and Gross Domestic Product have a positive relationship or influence to inflation, where if money supply increase, output or Gross Domestic Product will raise and inflation rate will increase, and if money supply decrease, output or Gross Domestic Product will fall and inflation will decrease, while interest rate, exchange rate, and import have a negative relationship to inflation, where if interest rate, exchange rate, and import increase, so inflation tend to decrease, and when

exchange rate, and import decrease, inflation rate will increase. The residue was explained by other variable like, social factor, politic, security and the role of factors and information.

5.4. Policy Implication to Indonesia

Inflation is important because inflation affects economic welfare and therefore serves as a goal of public policy in its own right in particular, a central objective of monetary policymakers is the maintenance of low and stable inflation. Problems measuring the average level of inflation will therefore affect a central bank's choice of inflation target (whether explicit or implicit). Indeed, many argues that the Federal Reserve should seek to stabilize measured inflation at some level higher than zero, in part because the U.S. CPI tends to overstate changes in the cost of living (Bernanke, et al., 1999). More problematically, if measurement errors in inflation vary over time in unknown ways, central banks could respond inappropriately to movements in observed inflation rates.

This study suggests the importance of supply side factors as affecting the general level of inflation in Indonesia. A long run relationship is found between the price level, real GDP, the exchange rate and import prices. With the opening up of the economy, import prices and exchange rate movements appear to have a significant impact on the general level of inflation. Alexius (1997) studying the case of Sweden, finds that in a small open economy such as Sweden that the

nominal exchange rate and import prices are central factors in influencing the level of prices. The effects of exchange rate movements on import prices appear to be influenced by country size according to Alexius. The country size argument could also perhaps be applied to Sri Lanka. The results are consistent with the studies of Nicholas (1990), Nicholas and Yatawara (1991), Weerasekera (1992), Rupananda (1994) who also find supply side factors as important determinants of the general price level.

Based on this research, it shows that indicators of macroeconomics have a significant influence to inflation, which showed that appreciation of rupiah gave effect to development domestic goods in abroad especially in price and would have effect to trade and income, include real output/ GDP then affected to investment and market economy toward capital outflow. In a certain period, when the oil booming was happening, inflation in Indonesia was caused increase of money supply, but that things could deny the influence which economic structural, because in that period, imbalanced between aggregate supply and aggregate demand still occurred which increased of inflation rate. Generally, Indonesian government still is using monetary approach in control general price.

Indonesian government had preferred use monetary instrument as a tool to muffle inflation, like open market mechanism or reserve requirement. Inflation in Indonesia not only caused by monetary crisis toward economic crisis, but also by increased of price in imported commodity or imported inflation and debt from out

of country swollen because rupiah depreciated to U.S.\$ and other currency. Furthermore, to control inflation, the first doing stabilize of rupiah exchange rate to foreign currency, especially U.S.\$. In stabilizing value of exchange rate, Indonesian government had better play monetary instrument through monetary authority by tight money policy so that can impress of interest of investment to infestation in Indonesia and to stabilize of general price. Tight money policy will do by increase of interest rate SBI through open market mechanism which will effective to decrease of money supply, and will increase interest rate of credit for real sector. Then government also should watch and observe structuralism vision in overcome of structural obstacles and everything which is needed to push inflation become low in Indonesia so that economic will grow stability.

Furthermore, if the extent of measurement error in inflation varies over time and across items or places, then growth comparisons could be affected; examples include measuring changes in living standards over long periods (Gordon, 2005) and comparing growth and productivity performance. (Ahmad, *et al.*, 2003).

Finally, because real quantities are typically estimated by deflating nominal values with a price index, inflation directly affects the construction of other economic statistics including real GDP and productivity. Thus, ability to correctly assess the effects of technological progress, the sources of economic growth, and changes in living standards over time hinges in an obvious way on the accurate measurement of individual and aggregate price movements.

CHAPTER VI

CONCLUSIONS AND RECOMMENDATIONS

6.1. Conclusions

Based on quantitative and descriptive analysis conducted in previous chapters can be seen that this research intends to see any indication of inflation and the inverse relationship between inflation and the influence factors of inflation or other macroeconomics indicators in context money supply, gross domestic product, interest rate, exchange rate, and import in Indonesia during 1991- 2010 are :

1. Indicators money supply, Gross Domestic Product, Exchange Rate, and Import Price are all factors that affect of inflation in Indonesia. Money supply, Gross Domestic Product, Exchange Rate, and Import Price showed how much of the inflation rate changed, as much as money supply, Gross Domestic Product, Exchange Rate, and Import Price.
2. The estimation result overly indicates that indicators money supply, Gross Domestic Product, is positively affecting the rate of inflation, based on the resulted value from estimation shows that when the money supply and GDP increase in 1% inflation rate will increase in 9.35% and 0.001% which means that any increase in these indicators causing the increase of the inflation rate.

3. While the indicators of the volume of Import, and the exchange rate are affecting the inflation negatively, based on the resulted value from estimation shows that when the exchange rate increases in 1%, inflation rate will decrease in 0.04%, and when the import increases in 1% inflation rate will decrease in 9.45%, which means that any decrement of these indicators will cause the rising of the inflation rate. In many of statistical testing performed coefficient results and significant partially at λ in 5%. While together, all independent indicators affect the rate of inflation, and the coefficient of determination obtained is able to explain the influence of independent indicators on the dependent indicators.
4. Indicators money supply, gross national product, exchange rate, and import price significantly affecting inflation in Indonesia in, so it can be concluded those indicators influence or have a relationship with the inflation in Indonesia.

6.2. Recommendations

Based on the study, it can be given recommendations as follows:

1. Control of inflation directly can affect money, so government should imply appropriate policy to manage inflation while perceive the effect to money, and through Central Bank, Government was hoped capable to manage circulations of money supply so that interest rate was used by any banks can be more competitive, this thing is important to increase investments and national economic growth.
2. Government should notice money growth in stable level to avoid inflation to shock which can give impact directly to real sector. Central Bank must keep when money supply was decrease or was increased by do monetary policy of market operation routinely to press the inflation rate and keep the exchange rate stable.
3. Government should control of inflation carefully. One of the tool to control inflation can used money supply, but pay attention to tool which is influenced by real sector.
4. For future research, it needs further study about the inflation in different real indicators or variables because it is really important for economic growth of Indonesia.

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Appendix 1

Regression Result

Dependent Variable: P
Method: Least Squares
Date: 09/23/11 Time: 06:33
Sample: 1991 2010
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MS	0.027011	0.001806	1.840857	0.1516
ER	-0.000541	0.000774	-2.499059	0.0160
GDP	0.004066	0.005607	1.775246	0.1202
IM	-1.01E-08	4.31E-09	-2.347613	0.0341
IR	-1.793387	0.240850	-7.446077	0.0000
C	-7.789291	11.01488	-0.707161	0.4911
R-squared	0.836483	Mean dependent var	11.50700	
Adjusted R-squared	0.778084	S.D. dependent var	11.59758	
S.E. of regression	5.463375	Akaike info criterion	6.477336	
Sum squared resid	417.8786	Schwarz criterion	6.776055	
Log likelihood	-58.77336	Hannan-Quinn criter.	6.535649	
F-statistic	14.32363	Durbin-Watson stat	1.541721	
Prob(F-statistic)	0.000044			

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.402688	Prob. F(2,12)	0.0675
Obs*R-squared	7.237692	Prob. Chi-Square(2)	0.2068

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 09/23/11 Time: 06:28

Sample: 1991 2010

Included observations: 20

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
MT	0.005207	0.010414	0.500066	0.6261
ERT	0.000512	0.000701	0.731228	0.4787
GDPT	-0.001940	0.005036	-0.385226	0.7068
IMT	3.19E-09	3.98E-09	0.800882	0.4388
IRT	0.122949	0.213990	0.574555	0.5762
C	-7.100726	10.41449	-0.681812	0.5083
RESID(-1)	0.495707	0.258146	1.920254	0.0789
RESID(-2)	-0.647724	0.281482	-2.301118	0.0401
R-squared	0.361885	Mean dependent var	-3.06E-15	
Adjusted R-squared	-0.010349	S.D. dependent var	4.689735	
S.E. of regression	4.713940	Akaike info criterion	6.228100	
Sum squared resid	266.6548	Schwarz criterion	6.626393	
Log likelihood	-54.28100	Hannan-Quinn criter.	6.305851	
F-statistic	0.972197	Durbin-Watson stat	1.837027	
Prob(F-statistic)	0.492391			

Multicollinearity Test

	MT	ERT	GDPT	IMT	IRT
MT	1.000000	-0.188992	0.100517	-0.143249	-0.213265
ERT	-0.188992	1.000000	0.677618	0.651084	-0.509777
GDPT	0.100517	0.677618	1.000000	0.650929	-0.780655
IMT	-0.143249	0.651084	0.650929	1.000000	-0.436776
IRT	-0.213265	-0.509777	-0.780655	-0.436776	1.000000

Heteroskedasticity Test: White

F-statistic	1.637132	Prob. F(5,14)	0.2145
Obs*R-squared	7.379235	Prob. Chi-Square(5)	0.1939
Scaled explained SS	3.288487	Prob. Chi-Square(5)	0.6556

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/23/11 Time: 06:35
Sample: 1991 2010
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	66.10957	28.22202	2.342482	0.0345
MT^2	-4.14E-06	7.48E-05	-0.055353	0.9566
ERT^2	-3.13E-07	2.87E-07	-1.088243	0.2949
GDPT^2	-6.90E-06	8.35E-06	-0.826471	0.4224
IMT^2	-1.08E-17	7.67E-18	-1.406852	0.1813
IRT^2	-0.029120	0.024054	-1.210575	0.2461
R-squared	0.368962	Mean dependent var	20.89393	
Adjusted R-squared	0.143591	S.D. dependent var	28.91131	
S.E. of regression	26.75521	Akaike info criterion	9.654660	
Sum squared resid	10021.78	Schwarz criterion	9.953380	
Log likelihood	-90.54660	Hannan-Quinn criter.	9.712974	
F-statistic	1.637132	Durbin-Watson stat	1.585268	
Prob(F-statistic)	0.214497			

Appendix 2

TABLE

Inflation rate in Indonesia 1991-2010 (%)

Year	Inflation	Growth (%)	Year	Inflation	Growth (%)
1991	9.41	-	2001	11.5	67.65
1992	7.53	-24.97	2002	11.88	3.20
1993	9.68	22.21	2003	6.59	-80.27
1994	8.52	-13.61	2004	6.24	-5.61
1995	9.43	9.65	2005	10.45	40.29
1996	7.97	-18.32	2006	13.11	20.29
1997	6.23	-27.92	2007	6.32	-107.44
1998	58.39	89.33	2008	10.1	37.42
1999	20.49	-184.97	2009	6.38	-58.31
2000	3.72	-450.81	2010	6.2	-2.90

Interest rate in Indonesia 1991-2010 (%)

YEAR	Interest Rate	Growth (%)	YEAR	Interest Rate	Growth (%)
1991	22.65	-	2001	16.18	17.74
1992	17.78	-27.39	2002	13.79	-17.33
1993	13.08	-35.93	2003	8.25	-67.15
1994	13.33	1.87	2004	7.12	-15.87
1995	16.95	21.35	2005	10.17	29.99
1996	16.78	-1.01	2006	10.7	4.95
1997	16.96	1.06	2007	7.65	-39.87
1998	36.78	53.89	2008	10.34	26.01
1999	14.25	-158.10	2009	7.87	-31.38
2000	13.31	-7.06	2010	7.2	-9.30

Money Supply in Indonesia 1991-2010 (Billion Rupiah)

Year	Money Supply (M2)	Growth (%)	Year	Money Supply (M2)	Growth (%)
1991	26.68	-	2001	177.73	8.75
1992	28.43	6.16	2002	166.77	-6.57
1993	37.04	23.25	2003	223.80	25.48
1994	45.37	18.38	2004	245.95	9.00
1995	53.34	14.93	2005	271.14	9.29
1996	64.09	16.77	2006	347.01	21.86
1997	78.34	18.19	2007	450.05	22.89
1998	101.20	22.58	2008	456.79	1.47
1999	124.63	18.80	2009	515.82	11.44
2000	162.19	23.15	2010	605.41	14.80

Exchange rate in Indonesia 1991-2010 (Rupiah)

Year	Exchange Rate	Growth (%)	Year	Exchange Rate	Growth (%)
1991	1992	-	2001	10400	7.74
1992	2062	3.39	2002	8940	-16.33
1993	2110	2.27	2003	8465	-5.61
1994	2200	4.09	2004	9290	8.88
1995	2308	4.68	2005	9830	5.49
1996	2342	1.45	2006	9020	-8.9
1997	8325	71.87	2007	9103	0.91
1998	8685	4.14	2008	10950	16.87
1999	7100	-22.32	2009	9400	-16.49
2000	9595	26.00	2010	8991	-4.54

GDP in Indonesia 1991-2010 (Trillion Rupiah)

Year	GDP	Growth (%)	Year	GDP	Growth (%)
1991	1.01	-	2001	1.44	3.69
1992	1.07	6.73	2002	1.50	4.19
1993	1.15	6.76	2003	1.58	4.65
1994	1.24	7.01	2004	1.65	4.57
1995	1.34	7.74	2005	1.75	5.46
1996	1.44	7.10	2006	1.85	5.21
1997	1.51	4.49	2007	1.96	5.97
1998	1.31	-15.11	2008	2.08	5.67
1999	1.32	0.78	2009	2.17	4.35
2000	1.39	4.69	2010	1.13	-92.34

Import in Indonesia 1991-2010 (Billion Rupiah)

Year	Import	Growth (%)	Year	Import	Growth (%)
1991	1.55	-	2001	7.07	-23.62
1992	1.60	3.12	2002	6.59	-7.28
1993	1.61	0.62	2003	6.68	1.35
1994	1.69	4.73	2004	7.89	15.33
1995	1.93	12.43	2005	9.15	13.77
1996	1.95	1.02	2006	8.42	-8.67
1997	1.94	-0.51	2007	9.11	7.57
1998	8.58	77.39	2008	1.09	-735.78
1999	6.95	-23.45	2009	7.97	86.32
2000	8.74	20.49	2010	1.12	-611.61