

## Analysis of Factors Affecting Inflation in Indonesia: an Islamic Perspective

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### Abstract

*This study aims to determine the factors affecting inflation. The research is descriptive quantitative in nature. The data used are reported exchange rates, interest rates, money supply and inflation during 2008-2012. The research data was analyzed using multiple linear regression analysis. The results showed in the year 2008-2012 the condition of each variable are (1) the rate of inflation has a negative trend, (2) the interest rate has a negative trend, (3) the money supply has a positive trend, (4) the value of exchange rate has a positive trend. The test results by using multiple linear regression analysis result that variable interest rates, the money supply and the exchange rate of the rupiah significant effect on the rate of inflation.*

**Keywords:** Exchange rates, Interest rates, Money supply, Inflation

### A. INTRODUCTION

The global financial crisis has changed the order of the Indonesian economy. The crisis that originated from the United States in 2007 were increasingly perceived impact to the rest of the world including developing countries in 2008 (Bank Indonesia, 2008). Indonesia economic performance declined because of the global financial crisis. The global financial crisis also had an impact on the Indonesian economy becomes unstable factors that affect the economic and non-economic factors. Economic factors such as inflation, interest rates, money supply, national revenue and international balance of payments position while non-economic factors such as national resilience, political, social, cultural, and security (Atmadja, 2002).

In Indonesia, the impact of the crisis began to be felt at the end of 2008 such as the drop in exports and the exchange rate are depreciated (Bank Indonesia, 2008). Uncertainty in Indonesian economic as a result of the financial crisis the United States provide opportunities for massive capital outflow from Indonesian capital market.

In principle, the various policies implemented by governments, directed at maintaining macroeconomic stability, system financing, and the durability of the Indonesian economy. In stabilizing the economy, the government then set up various policies to control economy. Government policy is made around monetary and fiscal. Monetary policy is a policy goal that is achieved through arrangements of money supply. Fiscal policy is an economic policy concerning arrangements of government spending and taxation (Nopirin, 1996).

Monetary policy is to regulate the money supply, while fiscal policy is more emphasis on setting earning and government spending. Problems often associated exchange rate on monetary policy, the tight monetary policy and loose monetary policy (Nopirin, 1996). Government doing loose monetary policy if economic recession is to increase the amount of money circulating in the community while tight monetary policy by the government if economic is booming with reduce the money supply due to dumpen price increases.

Expected economic conditions are stable rupiah. The stability of the exchange rate against the dollar was supported by domestic macroeconomic fundamentals are getting better in the middle economic development and global financial markets are volatile, but by the time the year 2008, known as global financial crisis, the exchange rate against the dollar experienced a trend of depreciation or weaken, supply conditions in the domestic currency is increasingly limited, and continued weakness in the global economy and falling commodity prices have pressured the Indonesian exports decrease the performance balance payment and exchange (Bank Indonesia, 2008).

BI as the monetary authority has the function of regulating the amount and allocation of money supply and interest rates to achieve macroeconomic objectives. There are several causes of inflation include: too much amount of money in circulation, famine, drought, and the budget deficit. However, none of these factors can explain the inflation consistently. Inflation is seen as the cause of the disruption of the stability of the market price of the goods due to expensive inputs and the resulting cost of production becomes nai, the supply decreases and the lower purchasing power.

Inflation control inevitably raises the cost (loss) for the economy, especially in the form of a decrease in national production, increased unemployment, or increase the burden of the government budget, if inflation control is done through the control of strategic commodities prices with subsidies or market operation instruments. Based on the explanation above, the formulation of the problem which will be discussed in this paper are:

1. How the effect of changes in interest rates against inflation?
2. How the effect of money supply to inflation?
3. How the effect of rupiah exchange rate on inflation?

## **B. METHODS**

This research includes the study is a survey research used samples and questionnaires as a data collection tool. With this method the objectives to be achieved should be able to describe certain characteristics of a population. Based on the research objectives have been set, the existence of the hypothesis to be tested, so this research is explanatory research, namely research that highlights the relationship between the study variables to test the hypotheses that have been formulated previously.

## **C. RESULT AND DISCUSSION**

### **1. Interest Rate**

Interest rate is the cost to be paid by the borrower on the loan received and a lender in return for their investments. Interest rates affect an individual's decision to spend more on options or put the money in savings (Nopirin, 1996). The interest rate is also a price that link the present to the

future, as the price of other than the interest rate is determined by the interaction between demand and supply of money (Suhaedi, 2000).

Interest rates can be divided into two, the nominal interest rate and real interest rates. The interest rate is the nominal interest rate, which can be observed in the market. While the interest rate is a concept that measures the real interest rate after the nominal interest rate minus the expected inflation rate. The interest rate is also used by the government to control the price level, when the high price level where the amount of money circulating in the community at large so that the consumption of high society would be anticipated by the government to set interest rates high.

The interest rate is the amount of interest paid per unit of time. In other words, people must pay for the opportunity to borrow money. The cost of borrowing money, measured in dollar per year per dollar borrowed, is the interest rate (Samuelson & Nordhaus, 2003). Interest is composition for use money. It is the excess cash paid or collected beyond the money (principal) borrowed or loaned (Leopold & Wild, 1998).

The determination of the interest rate must consider the level of inflation. This was disclosed by Fisher in Mankiw (2003) that the nominal interest rate will change for two reasons, namely because the real interest rate changes or because the inflation rate changes so the amount of the nominal interest rate is the sum of the real interest rate plus inflation rate. Real interest rate is the interest rate minus the expected rate of inflation, the nominal interest rate to it adjust the inflation. Nominal interest rate is the interest rate uncorrected for inflation (Taylor, 1999).

According to Keynes, in Kuncoro (2001), states that: The interest rate is due to the demand and supply of money from the public, while the fluctuating changes in interest rates affect the desire to hold investments, for example in securities, where prices may go up or down depending on the interest rate (when interest rates rise, the securities fall and vice versa), so the possibility of holders of securities will suffer capital loss or gain. Interest rates can be divided into two, namely:

- a. The interest rate is the nominal interest rate in the value of money. The rate is the value that can be read in general. The interest rate shows a number of dollars for every one invested dollars.
- b. The real interest rate is the rate that has been corrected due to inflation and is defined as the nominal interest rate minus the inflation rate. The interest are: [1] the burden on the use of money in a period, and [2] a possession or the reality of a company, business trade, or source power (Asmaya, 2006).

The factors that affect the size of the interest rate setting (loans and deposits) are as follows:

- a. The need for fund  
If banks are short of funds, while increasing the loan applicant, the bank does it so that the funds are quickly met by increasing the deposit rates. The increase in deposit rates would automatically interest loans will increase as well.
- b. Competition  
Deposit funds in the fight, and then in addition to the promotion of factors, the most important banks should pay attention to competitors. In the sense that if for an average deposit of 16%, so if you want to require funds quickly should we raise the deposit interest rate over competitors such as 16%. Conversely for lending interest must below competitor's rate interest.

- c. Government policy  
Both deposit and lending rates should not exceed the interest that already set by the government.
- d. Profit desired  
In accordance with the desired target, if the desired profit is large, then a large part of interest and vice versa.
- e. The time  
The longer the term of the loan, the higher interest rates, this is likely due to the risk of future.
- f. Quality assurance  
The more liquid the guarantees given, the lower the interest rate charged and vice versa.
- g. The company's reputation  
The reliability of a company that would earn credits determine the interest rate that will be charged later, because usually the company bona fide possibility of bad credit in the future is relatively small and vice versa.
- h. Competitive products  
Financed products sold in the market.
- i. Good relationship.  
Usually banks classify its customers among the major customers (primary) and regular customers (secondary). This classification is based activeness and loyartitas the customer with the bank. The main customers usually have close relationship with the bank so that in the determination of interest rates any different from the regular customers.
- j. Third-party assurance  
In this case the party who gives assurance to the creditor usually if bona fide parties guarantees, both in terms of ability to pay, good name and loyalty to the bank, then the different interest charged.

There are two types of factors that determine the value of the interest rate, the internal and external factors. Internal factors include interest rates, the money supply, and inflation is expected. While external factors is the international interest rate and the rate of change in foreign currency exchange rates. The domestic interest rate in Indonesia is related to the international rate. This is caused by the domestic financial market access to international financial markets and exchange rate policy is less flexible.

The function of the interest rate is:

- a. As the appeal for savers who have more money to invest.
- b. Interest rates can be used as a monetary tool in order to control the supply and demand of money circulating in an economy. For example, the government supports the growth of a particular industry sector where companies from the industry will borrow. So the government gave a lower interest rate than other sectors.
- c. The government can take advantage of interest rates to control the money supply. This means, the government can regulate the circulation of money in an economy.

## 2. The Money Supply

The money supply is the total value of money in the hands of the community. The money supply in the narrow sense (narrow money) is the money supply consisting of currency and demand deposits (Ocktavia, 2007).

$$M_1 = C + D \quad (1)$$

where:

$M_1$  = the amount of money circulating in the narrow sense

C = currency in circulation (banknotes and coins)

D = demand deposits or checks

Money supply in the broad sense ( $M_2$ ) is money supply in the narrow sense ( $M_1$ ) plus time deposits, or:

$$M_2 = M_1 + TD \quad (2)$$

where:

$M_2$  = the money supply in a broad sense

TD = time deposits

Technically, the money supply is the money really is in the hands of the community. The money is in the hands of banks (commercial banks and the central bank), as well as banknotes and coins (quarters) are not counted as government-owned money supply. The development reflects the money supply or in line with economic development. Usually when the economy grows and develops, the money supply also increases, its composition is changed. When economies become more advanced, the portion of the use of fewer currency, demand deposits replaced or near money. Usually when the economy is also increasing,  $M_1$  composition in the money supply is shrinking, because the greater portion of quasi-money (Raharja & Manurung, 2005).

The explanation is illustrated in Figure 1.

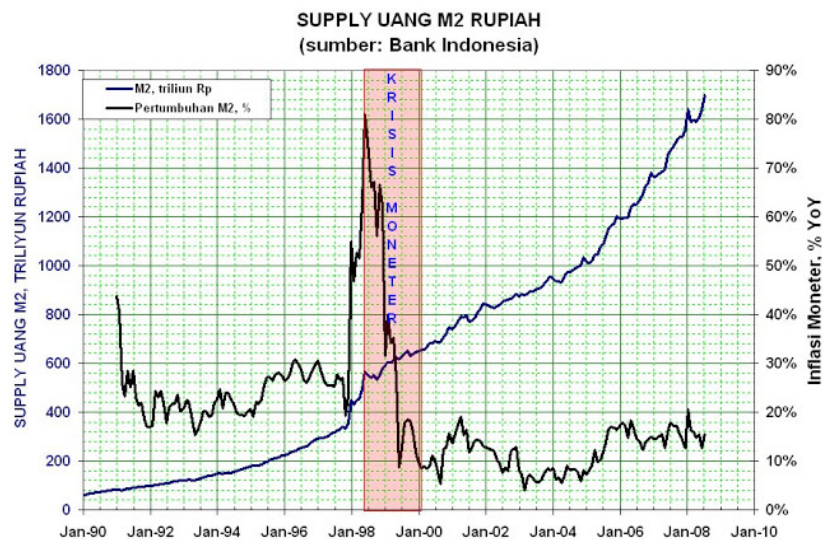


Figure 1 The Money Supply in ABroad Sense

### 3. The Exchange Rate

Basically, the notion of a currency exchange rate can be seen in two aspects: the nominal and real aspects. Nominal exchange rate is relative price of currencies of two countries (Mankiw, 2003). In practice, this will explain how much of a domestic currency to be paid to obtain one unit of foreign currency.

A simple approach to explain that if the amount of currency to be paid to obtain other currencies has increased, then it can be said that the exchange rate concerned has to depreciate. Vice versa, when the amount of currency paid into fewer than previously period then the exchange rate has appreciation. While the real exchange rate is the relative price of the goods between the two countries. The real exchange rate tells us the rate at which economic agents can trade goods from one state to another state. The real exchange rate between two countries is calculated from the nominal exchange rate and price levels in the two countries. A real exchange rate relationship currency with the nominal exchange rate, the price of domestic goods and the prices of goods abroad can be formulated as follows:

$$\text{Real Exchange Rate} = \text{Nominal Value} * \text{Ratio of Price Levels} \quad (3)$$

The ratio of the price level is the ratio between the price level in the country with a price level abroad. From Equation (3), if the real exchange rate higher then the price of foreign goods relatively cheaper than the price of domestic goods. Meanwhile, if the real exchange rate low, the price of foreign goods relatively more expensive compared to the price of domestic goods.

### 4. Conventional Inflation Theory

Inflation is a general rise in prices, or inflation can also be regarded as a decrease in the purchasing power of money. The higher the price increase the lower the value of money. That definition implies certain price increases or price increases due to crop failure, for example, not including inflation. Measure of inflation is the most widely used are consumer price index or cost of living index. This index is based on the price of the goods package selected and representing the spending patterns consumers. Inflation is the tendency of prices to rise in general and continuously. The increase in the price of one or two items can not be called inflation, unless the increase is widespread and resulted in an increase to the goods other (Kuncoro, 2001). A brief definition of inflation is the tendency of prices to the general ascending and continuously. The increase in the price of one or two goods are not called inflation. Terms existence of a continuous upward trend also needs to be underlined. Rising prices such as seasonal, ahead of the holidays, disasters, and so on, which are only temporary is not called inflation (Boediono, 1995).

### 5. Islamic Inflation Theory

According to Islamic economists, inflation is very bad consequences for the economy because:

- a. Potential disruption to the function of money, especially the savings function, the function of payment in advance, and the function of the unit calculation.
- b. Debilitating saving spirit and attitude of the public towards saving money.
- c. Increasing tendency to shop especially for a non-primary and luxury goods.
- d. Directing investments on things that are non-productive, the buildup of wealth such as land, buildings, precious metals, foreign currencies at the expense of investment towards productive as: agricultural, industrial, trade, transportation, and others.

Islamic economists Taqiuddin Ahmad ibn al-Maqrizi (1364 AD - 1441 AD), inflation classify into two groups, namely: (Karim, 2010).

**a. Natural Inflation**

This type of inflation caused by natural causes, in which people have no control. Ibn al-Maqrizi said that inflation is inflation caused by the decline in aggregate supply (AS) or the increase in aggregate demand (AD).

If using conventional analysis tools, namely the equation:

$$MV = PT = Y \tag{4}$$

where: M = the money supply

V = velocity of circulation of money

P = price level

T = the amount of goods and services

Y = level of national income (GDP)

then Natural Inflation can be defined as:

- 1) A disturbance in the amount of goods and services produced in an economy (T). For example, T, while M and V fixed, then the consequences P. That is, if the goods and services produced little but money in many societies, it is to acquire goods and services at a price the public must pay more because of the limitations of these goods and services.
- 2) Rising purchasing power in real terms. For example, the value of exports is greater than the value of imports, resulting in net imports occurred which resulted in M money so that if V and T remain then P.

Natural inflation will be distinguished by cause, namely: (Chapra, 1997)

- 1) As a result of money coming from abroad too much, which exports (X) and imports (M) so that the net export value is very large, then the resulting increase in aggregate demand (AD)

Example:

At the time of Caliph Umar ibn al-Khattab, caravan traders who sell goods overseas purchasing goods from overseas worth less than the value of the goods they sell, so they benefit. Gains in the form of excess money are brought into the Medina so that the income and purchasing power will go up (AD). Rising aggregate demand will make the AD curve shifts to the right and will lead to higher overall price level (P). Then, carried by Umar ibn al-Khattab to overcome these problems is he forbade the people of Medina to purchase items for 2 days in a row. Consequently, is the reduction of aggregate demand (AD) and the price level becomes normal.

- 2) Due to lower production levels (AS) because of the occurrence of drought, war, or embargo.

Example:

At the time of Umar ibn al-Khattab panceklik never occurred that resulted in the scarcity of wheat, as compared to gravik AS curve shifts to the left (AS) which lead to higher prices (P). Conducted by Umar ibn al-Khattab in overcoming this permasalahan, he did import wheat from Egypt, so the Aggregate Supply (AS) of goods in the market back up (AS) which then have an impact on the decline in prices (P).

### **b. Human Error Inflation**

Human Error inflation Inflation is said to be caused by the fault of the man himself. Human Error Inflation can be grouped according to the following causes: (Karim, 2010)

#### 1) Corruption and poor administration

If referring the equation  $MV = PT$ , then corruption will interfere with the price level (P) because the producers will raise prices to cover their production costs they incur. Prices is distorted by the component that should not be there so will result in high economic costs. In the end, there will be inefficient allocation of resources that would be detrimental to society as a whole.

If referring to equation AS - AD it will be seen that the administration of corruption and poor governance will lead to a contraction in aggregate offer curve (AS).

#### 2) Excessive tax

The effects of excessive tax on the economy is almost the same as the effect caused by corruption and poor administration that is a contraction in aggregate supply curve (AS).

#### 3) Printing money with the intention of taking advantage of excessive (Excessive seignorage).

Seignorage is the traditional meaning of the advantages of printing coins obtained by printing where the printing is usually owned by the ruler or kingdom. The monetary authorities in Western countries generally believe that printing money will result in a profit for the government.

On the other hand, economists Islam Ibn al-Maqrizi found excessive money printing which will obviously lead to higher price level (P) as a whole (inflation). Ibn al-Maqrizi argued that the money should be printed only at the minimum level needed to transact (buy-sell) and the fractions that have a small nominal value.

In calculating the rate of inflation, can use three methods, namely:

#### a) Consumer Price Index

Consumer Price Index (CPI) is commonly used to measure the cost of buying a basket of goods and services that are considered to represent consumer spending.



b) Wholesale Price Index

Wholesale Price Index (WPI) is usually used to measure the cost of which was purchased by the manufacturer, including raw materials and semi-finished goods.

c) GNP deflator

Gross National Product deflator is the average price of all goods weighted by the quantity of these items are actually purchased.

## 6. Analysis

The method according to major Indonesian dictionary is a systematic and planned way to perform all activities in order to achieve maximum goals. The research is a fundamental tool in development science and technology, and therefore the study aims to reveal the truth in a systematic, methodological, and consistent, by conducting analysis and construction.

### a. Population and sampling techniques

The population is the totality of all possible values, the result of counting or measurement, quantitative and qualitative characteristics of certain of the complete collection of all the members that want to study its properties (Sudjana, 1975). In this study population, and the sample taken is statistical data period of 2008 -2012. The sample is partially or representative of the population studied. (Arikunto, 1998)

### b. Research Variables

The variable is varied symptoms that become the object of research (Arikunto, 1998). While the variable is a homogeneous quantity whose value may change at any different time, the variables in this study include:

1) Independent variables (X), such as:

X<sub>1</sub>: Inflation is the inflation rate at the close of the year. The inflation data source is BPS or BankIndonesia

X<sub>2</sub>: The exchange rate is the exchange rate that occurred at the close of the year. This data was obtained from Bank Indonesia

X<sub>3</sub>: Certificates of Bank Indonesia interest rate is the interest rate of Bank Indonesia Certificates that occurred in the study period. This data was obtained from Bank Indonesia.

2) Dependent variable (Y)

In this study the dependent variable is the stock price is the closing price at the time of the end of the year.

### c. Data Analysis Techniques

- 1) Test assumptions used were multiple regression method
- 2) Normality Test

This test aims to test whether a variable is normally distributed or not, can be seen from the Kolmogorov-Smirnov test. Basis for a decision that if the probability greater than 0,05 then  $H_0$  is accepted which means that the variable is normally distributed and if the probability is less than 0,05 then  $H_0$  is rejected, which means that the variable is not distributed normal.

#### 3) Multicollinearity

One of the classic assumption is not happening multicollinearity existing between the independent variables in the model in the form of multiple linear regression model should be avoided multicollinearity occurrence. Multicollinearity means there is a perfect linear relationship or definitely among some or all explanatory variables. If part or all of the independent variables correlated then there multicollinearity. Consequences of multicollinearity is not a particular correlation coefficient and the error becomes very large or infinite.

#### 4) Regression analysis

Testing the hypothesis in this study using multiple regression analysis. Multiple regression analysis in this study is used to determine the effects of changes in interest rates, money supply and exchange rate against inflation rate year 2008-2012. The form of the model which will be tested in this study are:

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + e \quad (5)$$

where:

Y = stock price

a = constant

$b_1, b_2, b_3$  = coefficient regression

$X_1$  = Inflation

$X_2$  = exchange rate

$X_3$  = interest rate

e = Factor Disruptors (error)

##### a) Normality test

Normality test results using SPSS 16.0 indicates that the variable  $X_1, X_2,$  and  $X_3$  have probability values of each variable above 0,05. It means that data have a normal distribution so that further testing can be used with parametric statistics.

##### b) Autocorrelation test

Autocorrelation testing is intended to test whether there is a correlation between the independent variables. Durbin Watson value (DW) used to determine whether there is autocorrelation or not.

Results of tests that have been done show that the value of the DW at 1,862. The conclusion of this test states that no autocorrelation among independent variables.

c) Multicollinearity test

Multicollinearity test was conducted to determine that the independent variables are free of symptoms of multicollinearity. The results of this test can be seen from Tabel 1. Variance Inflation Factor (VIF) figures to those four variables appear as the following:

Tabel 1 Multicollinearity Test

Variable	VIF
Interest Rate	2,162
Money Supply	2,343
Exchange Rate	2,892
Inflation	1,782

Source: SPSS Output

Multicollinearity test results as seen in Table 2 shows that the VIF figures for these four variables is below 10, it means there is no multicollinearity.

d) Hypothesis testing

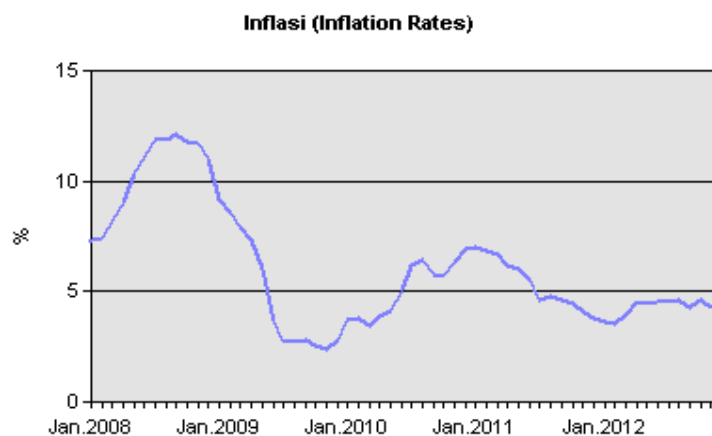
Based on the regression analysis results obtained regression equation as follows:

$$Y = 2276,064 + 252,679X_1 + 0,394X_2 + 170,710X_3 \quad (6)$$

e) Statistical test t

T-test is a test of the significance of the effect of variable interest rates, money supply, exchange rate against inflation partially. Based on regression testing has been carried out probability value for interest rates, the money supply respectively has significance level of 0,000 < 0,05 means H<sub>0</sub> successfully rejected. It means that that the interest rates, the money supply and the exchange rate partially is positive and significant effect on inflation.

Inflation occurred in 2008 – 2012 illustrated in Figure 2.



Source : Bank Indonesia

Figure 2 Inflation Rate

#### **D. CONCLUSIONS**

Based on the analysis results can be concluded as follows:

1. Changes in interest rates have positive effect on the rate of inflation with a Beta coefficient of 252,679.
2. The money supplies have positive effect on the rate of inflation with a Beta coefficient of 0,394.
3. The rupiah exchange rates have positive effect on the rate of inflation with the Beta coefficient of 170,710.

For further research can add other variables such as government policies and time periods used any longer for example eight years.

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