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Causality Analysis of The Money Supply and Interest Rate and Its Effect on Inflation and Investment in Indonesia

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ABSTRACT

This study aims to determine the effect of the money supply and interest rates on inflation and investment in Indonesia without using causality and using causality. In this study, the type of data used was secondary data from 2006 to 2017. The analysis tools used were Path. Money supply without using causality or using causality has a positive and significant effect on inflation in Indonesia. Interest rates without using causality or using causality have a positive and significant effect on investment in Indonesia. Inflation without using causality or using causality has a negative and significant effect on investment in Indonesia. The model without using causality is better or more feasible than the model using causality, seen from the value of the Goodness of Fit model without higher causality compared to the value of the Goodness of Fit criteria model using causality.

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1. INTRODUCTION

All countries have different economic developments. There are countries with a high level of progress and some are slow. In general, countries in the world are divided into developed countries and developing countries. Indicators that serve as benchmarks for developed and developing countries are: income per capita, number of workers, use of technology, life expectancy, and people's livelihoods. Developed countries and developing countries are a division of the country because of differences in the success of a country in carrying out development, mastery of science and technology.

In principle, developing the community's economy is the task of all levels of society and the government, because the main goal is the welfare of the nation. However, in accordance with the principles of living as a state and government, those responsible for developing the economy of this community are state administrators, especially the government. Therefore, state administrators must play an active role in encouraging investment to develop the community's economy in order to improve people's welfare.

Investment is defined as the purchase of goods used for production activities that can produce goods or services. Investment is considered important for a country because investment is made to meet the various needs and wants of the community, both individuals, groups, and even countries. Investment is needed [1].

Investment can also provide employment opportunities for the community so that unemployment is reduced. The country will develop dynamically if the investment expended is greater than the depreciation of the factors of production, if the opposite happens then the country will experience stagnation. In developing countries with a high population level, the ratio of investment to population is relatively smaller.

Macroeconomic investment is a component of national income so that the influence of a country's investment can be viewed from national income. Investment itself is influenced by several factors including return on capital and interest rates. High interest rates make investment unattractive or profitable because some of the capital for investment will be reduced. Understanding of interest rates by investors can help the accuracy of investment results because interest rates have consequences for the high costs of using funds in investment projects.

Interest rates have a significant effect on economic growth. This is due to lower interest rates lowering the level of business risk and increasing credit so that the real sector increases and economic growth also increases. Not only related to the amount of money in circulation, interest rates are a factor that influences changes in inflation. This is because the interest rate set by Bank Indonesia is a signal for banks to set interest rates for savings, time deposits and loans. In general, Bank Indonesia will raise interest rates if future inflation is expected to exceed the set target. Inflation is a condition where the circulation of money is greater than the circulation of goods. Generally, this is triggered by an increase in the price of goods.

2. LITERATURE REVIEWS

2.1 *Investment*

Economic activity is an essential activity that aims to meet the needs of life of the community. Thus, the intensity of a country's economic activity through investment and financial productivity. So, the higher the opportunity to meet the needs of the people of the region can be done one of them with investment.

Investment is defined as expenditures made by the business sector or private entrepreneurs and also by the government to purchase capital goods or production equipment [2]. The aim is to replace or increase capital goods in the economy which will be used to maintain or increase the amount of production in the future.

Investment is an activity of allocating or investing resources at this time (now) with the hope of getting benefits in the future [1]. Investment is part of the output used by private companies to produce output in the future [3]. Based on this understanding, it can be concluded that investment is an activity of planting a number of funds for activities that produce goods or services in the hope of making a profit. Because of the many potential sectors to be used as investment and the many types of investment.

2.2 *Inflation*

Inflation is the process of increasing the general prices of goods or services to rise in general and continuously within a certain period [4]. An increase in the price of just one or two goods is not called inflation, unless the increase also results in an increase in most of the prices of other goods. Likewise, price increases due to seasonality before religious holidays or those that occur only once do not have a continuing effect and are not called inflation. This does not mean that the prices of various goods increase by the same percentage [5].

Basically, that inflation is an economic symptom in the form of rising price levels. Inflation is a condition where the prices of goods generally increase, which is mainly due to the supply of money far exceeding the demand for money [6].

2.2 *Amount of Money in Circulation*

The amount of money in circulation is the amount of currency and demand deposits as well as quasi-money circulating in the community issued by the Central Bank. The amount of money in circulation (JUB) is also called the general supply of money. The more money in circulation, the weaker the exchange rate (purchasing power) of money and the higher the prices of necessities. In other words, the more money in circulation the higher the inflation rate. Monetary authorities (central banks) and commercial banks are institutions that create money. Central banks issue currency while commercial banks issue and circulate demand deposits and quasi money.

a. *In a narrow sense M1 (Norraw Money)*

The money supply is all currency (cash) held by members of the public and demand deposits held by individuals at commercial banks. Demand deposits in this sense are only demand deposits that can be used for transactions directly by the owner, so demand deposits kept in public and central bank safes or owned by banks in other banks are not included as demand deposits.

b. *In a broad sense M2 (Broad Money)*

Money in circulation is not only consisting of currency and demand deposits held by the public, but also includes time deposits and public savings, because these savings and time deposits can be converted into cash the same as currency, even in an increasingly advanced economy many transactions are conducted through banks.

c. *In the broadest sense M3*

The money supply also includes money deposited in other non-bank financial institutions (not commercial banks and savings banks) if it meets the requirements as money namely the price is fixed and can be accepted by society in general (multi-finance, insurance, pawnshops, etc.).

2.4 Interest Rates

The interest rate, commonly known as the BI Rate, is announced by the Board of Governors of Bank Indonesia at every monthly meeting of the Board of Governors and is implemented in monetary operations carried out by Bank Indonesia through liquidity management in the money market to achieve monetary policy operational targets. The BI rate is a policy interest rate that reflects the monetary policy stance set by the Indonesian bank and announced to the public.

Bank Indonesia in general will raise the BI Rate if future inflation is expected to exceed the set target, on the other hand, Bank Indonesia will lower the BI Rate if future inflation is expected to be below the set target.

Interest rate is the price paid for a unit of currency borrowed for a certain period of time. For the borrower, the interest rate is the cost of borrowing or the price paid for the money lent, which is the exchange rate from present consumption for future consumption [7].

3. METHODS

Analysing data as a problem solver for the influence of the money supply and interest rates on inflation and investment in Indonesia in this study, was calculated using AMOS version 21.0 software, namely to analyse the results of this study through Path Analysis using a two-step structural model. Time Series data is used to determine the effect between the money supply and interest rates from 2006 to 2017against inflation and investment.

Path analysis is the development of a regression model that is useful for the fit of the correlation matrix of two or more models to be compared by researchers. Models are usually depicted with circles and arrows that show causality. The regression value that will be predicted by the model is compared with the correlation matrix of the observed variables and the goodness of fit value is calculated. The best model is chosen according to the value of goodness of fit [8].

The steps of data analysis in modeling and structural analysis [8], namely:

1) Model development based on theory.
2) Create a path diagram.
3) Converts path diagrams to structural equations.
4) Choose the type of input matrix and estimate the proposed model.
5) Assess the identification of the structural model.
6) Assessing the goodness of fit criteria.
7) Model interpretation and modification.

4. RESULTS AND DISCUSSION

The statistical test of the relationship between variables which is the basis of the research hypothesis has been proposed. Statistical tests of the results of processing with AMOS are carried out by looking at the significant level of relationship between variables which is shown through the critical ratio (CR) value and the significant probability value of each relationship between variables. This statistical testing process can be seen in the table below:

Table 1. Parameter Estimation Results of Influence Between Variables Without Using Causality Based on the Path Analysis Model

			Estimates	SE	CR	P	Label
Y1	<---	X1	.000	.000	-4,158	***	par_1
Y2	<---	X2	667,590	100,149	6,666	***	par_2
Y2	<---	Y1	-877,145	71,731	-12,228	***	par_3

Source: AMOS Analysis Results

Table 2. Parameter Estimation Results of Influence Between Variables Using Causality Based on the Path Analysis Model

			Estimates	SE	CR	P	Label
Y1	<---	X1	.000	.000	-4,158	***	par_1
Y2	<---	X2	667,590	101,477	6,579	***	par_2
Y2	<---	Y1	-877,145	72,682	-12,068	***	par_3
X1	<-->	X2	324419.349	484244605	.670	.503	par_4

Source: AMOS Analysis Results

Referring to the results of the final stage of testing the overall model using causality and without using causality, the model equation can be written in the form of Path Analysis as follows:

$Y1 = 0.000\ X1 + 1.429\ \mathcal{E}1$

$Y2 = 667.590\ X2 – 877.145\ Y1 + 207963.991\ \mathcal{E}2$

The Effect of the Money Supply on Inflation in Indonesia

Based on the results of the analysis of the money supply variable, it has a positive and significant effect on inflation in Indonesia. Inflation is determined by an increase in the money supply and by the psychology (expectations) of society regarding future price increases. If people already think so, then there is no tendency to save cash anymore and they prefer to keep assets in the form of goods. This is also in line with the factors that cause inflation. Demand pull inflation, namely inflation caused by people's demand for various goods is too strong so that prices increase in general.

The Effect of Interest Rates on Investment in Indonesia

Based on the results of the analysis of the interest rate variable, it has a positive and significant effect on investment in Indonesia. The increase in interest rates followed by an increase in investment in Indonesia can be caused because Indonesia is considered a potential country for investment. Government policies that open up investment for both Foreign Investment (PMA) and Domestic Investment (PMD) encourage an increase in the value of investment in Indonesia.

Movements in interest rates (BI Rate) were not followed by movements in credit interest rates for public banks in Indonesia. In addition, it is suspected that the rate of return on capital enjoyed by investors is still greater than or equal to the interest rate investors have to pay to banks. This causes an increase in the interest rate (BI Rate) to have a positive effect on investment in Indonesia.

This matter is in accordance with the theory of interest from the classics who say that "The Interest Rate is an interaction between Savings (S) and Investment (I)". That saving is a function of the interest rate. So, the higher the interest rate, the higher the desire of people to save. This theory has the understanding that at a higher interest rate the public will be more motivated to sacrifice or reduce spending on consumption in order to increase savings. Furthermore, investment also depends on or is a function of the interest rate. The lower the interest rate, the smaller the desire to invest and conversely, the higher the interest rate, the greater the desire to invest.

Influence of Inflation on Investment in Indonesia

Based on the results of the analysis of the inflation variable, it has a negative and significant effect on investment in Indonesia. Inflation has both good and bad effects depending on whether inflation is severe or not. Low inflation can boost the economy because it can increase national income, people are more enthusiastic about working, saving and investing. High inflation will cause people to be less enthusiastic about working because their fixed salary cannot keep up with their needs due to rising prices of goods and services so that their lives get worse over time. Not only that, high inflation will also reduce people's desire to invest because the value of the currency decreases.

The high rate of inflation reduced public consumption due to the declining ability of the public to buy goods due to soaring prices. If inflation persists, many producers will go bankrupt because their products will be relatively more expensive so that no one can afford to buy them. It can be concluded that there is a negative relationship between inflation and investment. That is, the more unstable the macro economy of a country, the lower the level of investment.

The Causal Relationship of the Money Supply and Interest Rates in Indonesia.

Based on the results of the analysis of the causality variable between the money supply and interest rates, the effect is positive and not significant. In regulating and controlling the economy, Bank Indonesia implements monetary policies. One of the policy instruments issued by Bank Indonesia is interest rates. Bank Indonesia has the right to issue Bank Indonesia interest rates, also known as the BI Rate. The BI Rate is the reference interest rate for commercial banks or other financial institutions. The BI Rate is also able to control the economy in Indonesia. The BI Rate has influence in maintaining the stability of the value of money and is announced to the public and other commercial banks in a transparent and open manner. The BI Rate will be regulated so that it remains to keep the money supply stable as well. The main consideration in determining the BI Rate is to maintain the inflation rate consistently for a certain period with the targeted inflation rate.

5. CONCLUSION

Some of the results of analysis, discussion and testing of hypotheses, some conclusions can be drawn as follows:

1) The money supply without causality and using causality has a significant and positive effect on inflation in Indonesia. This indicates that if there is a one-unit increase in the money supply variable, the inflation variable will increase.
2) Interest rates without causality and using causality have a significant and positive effect on investment in Indonesia. This shows that if there is a one-unit increase in the interest rate variable, the investment variable will increase.
3) Inflation without causality and using causality has a significant and negative effect on investment in Indonesia. This shows that if there is a one-unit increase that occurs in inflation, the investment variable will decrease.
4) Causality between the money supply and interest rates has a positive and insignificant effect. This shows that there is no reciprocal relationship between the money supply and interest rates in Indonesia.
5) Comparison of models without causality and using causality through the results of measuring the level of fit (Goodness of Fit), it can be seen that the model without using causality is better or feasible to use on the basis of comparing the criteria of Goodness of Fit.

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