Exploring the Impact of selected Macro-Economic Variables on GDP of Indonesia

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Abstract

This study aims to obtain information and knowledge that is true, valid, reliable, and accountable impact of macroeconomic variables on Gross Domestic Product in Indonesia year 2010-2017, either simultaneously or partially. This study uses secondary data by quarter. The analysis technique used is multiple linear regression analysis. This study also uses classic assumption test and hypothesis test to know the effect of inflation variable measured using CPI, dollar exchange rate against rupiah, reference rate / BI Rate to Gross Domestic Product at constant price of year 2010. The method of analysis used is statistical analysis descriptive, analytical requirements analysis, classical assumption test, multiple linear regression analysis at a significance level of 5%. Hypothesis testing is done by using partial regression test (t test) and simultaneous test (Test F) and test of coefficient of determination (R2). Partial research results show that there is no influence between inflation and interest rates on GDP, while there is a positive effect the exchange rate to GDP. The ability of independent variables namely inflation, exchange rate and interest rate able to explain the variable of Gross Domestic Product (R2) 76,4%.

Keywords: Gross domestic product, inflation, exchange rate and interest rate.

Introduction

Gross Domestic Product (GDP) is used as an indicator of a country's economic health. Gross Domestic Product can also be used as a measure of a country's living standards. Calculation of Gross Domestic Product uses a uniform method from one country to another, therefore the value of GDP calculation of a country can be used to compare the productivity of various countries.

Based on Indonesia's economic report by Bappenas, in the second Quarter of 2016, world gross domestic product growth was recorded at 2.2% (YoY). This figure is still lower than the same quarter in 2016 which reached 2.8%. This is because the economic growth of the world's major countries is still showing a slowdown. The global economic slowdown also affected Indonesia. This caused a decline in the prices of Indonesian export commodities to a low level for years. Based on the Indonesian Economic Report compiled by the Ministry of National Development Planning, in 2015 Indonesia's Gross Domestic Product fell to USD 863 billion from USD 890 billion in the previous year and GDP per capita dropped to USD 3,377 from USD 3,531 in 2014. The main factor causing the decline in GDP in the USD is the weakening of the rupiah exchange rate.

Literature Review

Gross Domestic Product: GDP which is part of national income or the national accounting, measures the total value of goods and services produced in a country in a certain period. According to Case & Fair,
the definition of GDP is the value of final goods and services based on market prices, money is produced by an economy in one period using the factors of production that are in the economy (Case & C, 2016).

According to Mankiw, Gross Domestic Product (GDP) is total income and total national expenditure on the output of goods and services produced by a country. GDP can measure a country's economic growth because GDP is an added value which is a reflection of all economic activities in a country (Mankiw, 2007).

Sukirno explained that the Gross Domestic Product is a national product that is realized by domestic production factors (owned by citizens and foreigners) in a country. GDP consists of household consumption (C), investment (I), government expenditure (G) and net exports (X-M) (Sukirno, 2005)

From the above definition, it can be concluded that the Gross Domestic Product is the sum of all goods and services produced by a country in a certain period that can be used by policymakers to determine the level of economic development of the country.

Inflation: In the opinion of Mceachern explained that inflation is a continuous increase in the price level of an economy due to an increase in aggregate demand and aggregate supply (Triandaru, 2000).

According to Mahardika, in his journal, inflation is a symptom that shows a general increase in the price level that continues. However, if the price increase of only one or two items is not called inflation unless the increase extends or causes a large increase in the price of other goods (Jean et al., 2011). Inflation is a monetary event that shows a tendency to increase the prices of goods in general which means a decrease in the value of money (Judisseno, 2005). Tajul Khalwaty argued that the increase in prices was not solely due to the influence of technology, the nature of goods and the influence of the approaching the feast day, but the inflation that lasted long enough (Khalwaty, 2000). Whereas according to Nopirin explained that inflation is a continuous process of increasing general prices of goods (Nopirin, 2011).

Exchange Rate: According to Krugman, the exchange rate is the value of a country's currency compared to other countries' currencies (Krugman P.R and M. Obstfeld, 2003). The exchange rate or commonly referred to as the foreign exchange rate according to Sadono Sukirno is the price or value of one currency stated in the size of another country's money. The exchange rate can also be defined as the amount of domestic money needed to obtain a unit of foreign currency (Sukirno, 2014). While the definition of the exchange rate according to Mankiw is the price level agreed upon by residents of both countries to trade with each other. The exchange rate is divided into two, nominal and real exchange rates. The nominal exchange rate is the relative price of the two countries' currencies. While the real exchange rate is the relative price of the goods of both countries (Salvatore, 2008). There are two systems that can be used to determine foreign exchange rates, fixed exchange rate systems and exchange rates change. In the fixed exchange rate system, the government will determine the value of exchange between domestic currencies and foreign currencies. Whereas exchange rates change freely the demand and supply of foreign currencies on the market will determine the exchange rate (Sukirno, 2014).

Based on the definition of exchange rates according to the experts above, it can be concluded that the exchange rate is the value of one country's currency compared to the size of money in another country. The exchange rate can change depending on the economic conditions in the country.

Interest Rate: Interest rates can also be interpreted as the price that must be paid to the customer (who has deposits) with what must be paid by the customer to the bank (the customer who gets the loan) (Kasmir, 2014). This interest rate is called the deposit interest rate. Therefore, the higher the interest rate, the people will automatically compete to save their money in the bank because they will get even greater rewards. Conversely, the lower the interest rate will make people no longer interested in saving money in the bank.

Whereas Mishkin argues that interest rates are borrowing costs or prices paid for leasing funds (Mishkin, 2008).
Research Hypothesis

1. Effect of Inflation on GDP

For some experts, inflation is considered an epic problem in the economy. Fischer, Baro and Bruno, and Easterly concluded that the economy will drop dramatically when inflation is high while the economy will rise again when inflation decreases. However, Mallik and Chowdhury (2001), found that in research in four countries in South Asia (India, Pakistan, Bangladesh and Sri Lanka), in the long run, inflation had a positive effect on GDP. Inflation will have a good impact on the economy if the amount of inflation is still in the low inflation category. If inflation in a country is in the category above the low inflation category, it will have a bad impact on the economy (Yudhistira, 2013).

According to Umar Kibria, it shows that there is a relationship between inflation and GDP. When inflation increases, it will reduce investment that will have a negative impact on the economy (Jilani, Cheema, Asim, & Kibria, 2014).

Suva and Fiji state that inflation and GDP have negative results. At the fixed inflation rate, there will be positive results for GDP. Low inflation rates will not have a significant effect on GDP, actually, it can even be a positive effect. An inflation rate that is too high will have a negative impact on GDP. The increase in inflation will reduce GDP per capita and investors (Semuel, 2015).

From the above theory, there is an influence between inflation and gross domestic product.

2. Effect of Exchange Rates on GDP

According to Umar Kibria et al, said the exchange rate volatility affects GDP. This exchange rate volatility will cause a decrease in trade which results in the impossibility of the expected results from exports. This certainly affects the amount of goods produced (Jilani et al., 2014).

Ito, Isard, and Symasnsky found that high rates of economic growth were supported by adequate export growth, thus increasing exchange rate values due to the increasing demand for national currencies. A good exchange rate will help capital market liquidity so that the investment world moves forward, which ultimately achieves the desired level of economic growth (Semuel, 2015).

Based on these two theories, it can be concluded that exchange rate volatility will affect trade with other countries. A good exchange rate will encourage the world of investment which ultimately encourages Gross Domestic Product.

3. Effect of Interest Rates on GDP

According to Umar Kibria et al, the interest rate and GDP have an inverse relationship. If the interest rate is high, it will reduce economic growth (Jilani et al., 2014). Looking at it from a GDP perspective, Udoka and Roland agree that interest rates are one of the factors that indicate a country’s economic growth, but if there is an increase in interest rates it also shows depreciation of GDP (Semuel, 2015).

Interest rates are one of the factors of macroeconomic growth. High or low interest rates will have an impact on the economic report and develop to influence the rate of economic growth. (Jilani et al., 2014) International Theory Fisher Effect states that countries with high interest rates will be followed by a high inflation rate as well. Mankiv stated that high inflation would make the company's production costs tend to increase so that it would reduce production capacity, so that it would reduce the number of products produced. This increase in interest rates will also reduce the amount of investment which is a reflection of the company to produce products. Conversely, a decrease in interest rates causes an increase in investment will make companies produce increased production so that it can be considered as an increase in GDP (Semuel, 2015).

According to the above theory, it can be concluded that interest rates are one of the factors that indicate a country’s economic growth, but if there is an increase in interest rates it also shows depreciation of GDP. This is because rising interest rates can reduce the amount of investment available so that the company will reduce its production.
Research Method

The object of this study is Gross Domestic Product in Indonesia. Gross Domestic Product in Indonesia is affected by inflation, exchange rates, interest rates.

The scope of this study Indonesian national data, such as Indonesia's GDP data, inflation data, rupiah exchange rate data and interest rate data.

In this research, the Gross domestic product is dependent variable but inflation, exchange rate, and interest rate are independent variables.

Data: In this research secondary data is used. In this paper 7 years data is collected quarterly from the period 2010-2017. The data of GDP is collected from the Ministry of Trade. The data on inflation, exchange rate, and interest rate are taken from the Bank of Indonesia. SPSS v.24.0 software is used for this analysis.

Model Specifications:

To determine the quantitative the impact of inflation variables, exchange rates and interest rates on Gross Domestic Product with multiple regression calculations as follows:

\[ Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + e \]

The above figure, independent variables (inflation, exchange rate, interest rate) have effects on dependent variables (GDP) in Indonesia

Results and Discussion

Based on data processing, then the maximum, minimum, mean and standard deviation value are show in this table:

Table 1: Result from Regression Analysis

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(Constant)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>INFLATION</td>
<td>-.039</td>
<td>.015</td>
<td>-.282</td>
<td>-2.642</td>
</tr>
<tr>
<td>FOREX</td>
<td>.797</td>
<td>.123</td>
<td>.643</td>
<td>6.478</td>
</tr>
<tr>
<td>INTEREST RATE</td>
<td>-.056</td>
<td>.022</td>
<td>-.259</td>
<td>-2.495</td>
</tr>
</tbody>
</table>
Based on the results of the regression analysis shown in table 2, the regression equation model is obtained as follows:

\[ \hat{Y} = 7,836 - 0.039 \text{Inflation} + 0.797 \text{Forex} - 0.056 \text{Interest Rate} \]

Coefficient value \((b_1)\) is -0.039 which means that if the inflation value increases by one unit with the assumption of a fixed exchange rate and interest rate, then the Gross Domestic Product will be reduced by 0.039 units. The negative coefficient indicates a negative relationship between inflation and Gross Domestic Product.

The coefficient value \((b_2)\) is equal to (0.797), which means that if the value of the exchange rate increases by one unit assuming the variable inflation and interest rates are considered constant, then the Gross Domestic Product will increase by 0.797 units. A positive value coefficient shows a positive relationship between exchange rate and Gross Domestic Product.

Coefficient value \((b_3)\) is -0.056 which means that if the interest rate increases by one unit assuming the inflation value and exchange rate are considered constant, the Gross Domestic Product will decrease by 0.056 units. The negative coefficient shows the occurrence of a negative relationship between interest rates and Gross Domestic Product.

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>1.119</td>
<td>3</td>
<td>.373</td>
<td>26.741</td>
<td>.000</td>
</tr>
<tr>
<td>Residual</td>
<td>.391</td>
<td>28</td>
<td>.014</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>1.510</td>
<td>31</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Influence of Inflation on Gross Domestic Product

The regression test results partially show that inflation has a negative and significant effect on Gross Domestic Product in Indonesia. This can be seen based on the \(t\)-count value for the inflation variable of -2.664 and negative. This shows that \(t\)-count (-2.642) < \(t\) table (2,048), so it can be concluded that partially the hypothesis \(H_1\) is rejected and accepts \(H_0\). In addition, the significant number of the test results is 0.013 less than the level of significant (0.013 < 0.05) so that it shows a significant influence. So from the results of these tests, it can be concluded that inflation has a negative and significant influence on Gross Domestic Product in Indonesia.

Rising inflation on a small scale is good for economic growth because it can drive productivity resulting in an increase in the number of goods and services produced. However, inflation on a large scale can have a negative impact on the economy because it will cause a large increase in production costs so there can be a reduction in GDP because producers are trying to reduce the goods and services they produce. (Mankiw:1999) also stated that high inflation would make the company's production costs tend to increase and companies would reduce production capacity so that output would also decrease.

The results of this study prove the theory proposed by Suva and Fiji which states that inflation and GDP have negative results. The high inflation will reduce GDP per capita.

The results of this study are also in line with previous research conducted by Umar Kibria with the title Exploring the Impact of Macro Economic Variables on GDP Growth of Pakistan. "Which states that inflation has a negative relationship to GDP because the rate of inflation will reduce investment so that it affects capital to produce goods and services."
Entering the final quarter of 2010, Indonesia was characterized by rising inflationary pressures. The main source of inflation is from the volatile foods group. This increase in inflation came from the trend of rising commodity prices in the global market. These inflation pressures slow down the acceleration of economic growth and reduce people's purchasing power and reduce economic competitiveness. This has caused a decline in the amount of GDP in the final quarter of 2010. Therefore, reducing the rate of inflation growth is important to increase GDP growth in Indonesia.

**Influence of Exchange Rate on Gross Domestic Product**

The results of regression testing partially show that there is a positive influence between the exchange rate on the Gross Domestic Product. This can be seen in table 2, where the t_count value for the exchange rate variable is 6.478 and is positive. Thus T_count (6.478) > T_table (2.048). So it can be concluded that partially the hypothesis H2 is accepted and H0 is rejected. In addition, the number of the significance of the test results is 0.000 less than the level of significance (0.00 <0.05) so that it shows significant results.

The movement of currency exchange rates is a consequence of the interaction that occurs between economic actors in conducting transaction activities in various countries. This interaction will increase along with increasing economic activity in various countries. Instability in currency exchange movements can result in a country's macroeconomic instability. Exchange rate instability will affect trade with other countries. A good exchange rate will encourage the world of investment which ultimately encourages Gross Domestic Product.

In Indonesia, the exchange rate policy adopted by Bank Indonesia was directed at keeping rupiah appreciation consistent with macroeconomic developments and not fluctuating. Indonesia is one of the countries implementing a floating exchange rate system because the exchange rate can be a shock absorber and plays a role in maintaining the external balance of an economy.

Weakening rupiah exchange rate (depreciation) which means the exchange rate of the dollar against the rupiah strengthens (appreciation) does not always have a negative impact on Indonesia, because the government will utilize the weakening rupiah exchange rate to increase exports which will make domestic imports decline so that it will increase economic growth Indonesia. Because when the rupiah weakens, Indonesian-made products that are exported will become more competitive in the world market.

**Influence of Interest Rates on Gross Domestic Product**

The results of regression testing partially show that interest rates have a negative and significant impact on Gross Domestic Product in Indonesia. This can be seen based on the t_count value for the inflation variable of -0.332 and negative. This shows that T_count (-2.495) < T_table (2.048), so it can be concluded that partially the hypothesis H1 is rejected and accepts H0. In addition, the significance number of the test results is 0.005 less than the level of significance (0.030 <0.05) so that it shows a significant influence. So from the results of these tests it can be concluded that interest rates have a negative and significant influence on Gross Domestic Product in Indonesia.

High interest rates will limit credit growth and will result in a slowdown in GDP growth. Since mid-2013, Bank Indonesia has increased its benchmark interest rate (BI Rate) from its lowest level in history in the first quarter of 5.75%, then gradually increased to reach 7.67% in the final quarter of 2014. High interest rates of Bank Indonesia this is one of the factors that led to a slowdown in Indonesia's GDP growth for the 2011-2015 period (Bank Indonesia:2014). This confirms the results of the study that interest rates significantly affect GDP in Indonesia.
Influence of Inflation, Exchange Rate and Interest Rate together on Gross Domestic Product

Based on the test results in table 4, it can be seen that the calculated $F_\text{count}$ value is 26.741. The table can be found in the statistics table, where $df_1 = 3$ (number of variables-1 or 4-1 = 3) and $df_2 = 28$ (n-k-1 or 32-4-1 = 28) so that $F_{\text{table}}$ is 2.93. This means that the value of $F_{\text{count}} > F_{\text{table}}$ (26.741 > 2.93) then $H_0$ is rejected so that it can be concluded that there is an influence between the variables of inflation, exchange rate and interest rate together on the Gross Domestic Product. The significance value of the test results is 0.00 smaller than the significance level (0.00 < 0.05) so that it shows a significant effect. So from the results of this test, it can be concluded that inflation, exchange rates and interest rates have a positive and significant influence on Gross Domestic Product in Indonesia so the third hypothesis in this study is proven and accepted.

Overall model parameters indicates shows that inflation, exchange rates and rates simultaneously have a positive and significant influence on Gross Domestic Product. This explains that the hypothesis proposed in this study, namely there is an influence between inflation, exchange rate and interest rates together on Gross Domestic Product, can be accepted. Based on the results of data processing, it can be seen that the value of multiple correlations symbolized by $R$ is 0.861. This shows that there is a very strong relationship between the variables of inflation, exchange rates and interest rates on Gross Domestic Product in Indonesia.

Conclusion

1. Inflation has a negative and significant impact on Gross Domestic Product. This means that the higher the level of inflation in Indonesia, the lower the Gross Domestic Product in Indonesia, and vice versa.

2. The exchange rate has a positive and significant influence on the Gross Domestic Product in Indonesia. This means that the higher the exchange rate, the higher the Gross Domestic Product in Indonesia, and vice versa.

3. Interest rates have a negative and significant effect on Gross Domestic Product. This means that the higher the interest rate in Indonesia, the lower the Gross Domestic Product in Indonesia, and vice versa.

4. Inflation, exchange rates and interest rates simultaneously have a significant effect on Gross Domestic Product. This means that the inflation rate, exchange rate and interest rate together affect the size of the Gross Domestic Product in Indonesia.

Acknowledgment

This research was funded by the author's personal funds.

References


