Analysis The Impact of World Oil Price Fluctuations on Indonesia Economic

Lysia Novarinda
Universitas Negeri Malang, Indonesia
E-mail: novarinda.lysia@gmail.com

Abstract

Indonesia is a developing country with an open economy is characterized by the bilateral agreement for economic integration between countries and between regions in the world. Open economy country also have integrated themselves into the global economic arena. Indonesia also participated actively in the Organization of the Petroleum Exporting Countries (OPEC). Lately, the price of petroleum in the international market is very volatile with an upward trend. The surge in oil prices were very high concern to most countries around the world. This study aims to determine the impact of oil price fluctuations on world markets on the economy of Indonesia period 2005-2015. Macroeconomic variables selected to see the effect of fluctuations in oil prices is economic growth, inflation, money supply, the real exchange rate of the rupiah against the US dollar and interest rates. Quantitative research, with models Vector Error Correction Model (VECM). The results of this study are oil price fluctuations on the world market provide long-term impact on the economy of Indonesia. This influence is transmitted through several macroeconomic variables, namely economic growth, inflation, money supply, the real exchange rate of the rupiah against the US dollar and interest rates.

Keywords: Oil Price Shocks, Demand Effect, Supply Effect.

I. Introduction

Indonesia is a developing country with an open. According Atmadja (2001) economy, the open economy country is a country that has been opening up to the international community to get involved in various activities of the trade of goods, services, and capital transactions with other countries. Disclosure of the economic system of a nation can lead the relationship with other countries became one of the important aspects that affect the country’s economic progress. Besides open economy country also have integrated themselves into the global economic arena. That in an open economy characterized by the existence of an agreement on bilateral economic integration between countries and between regions in the world. Indonesia is one of the countries actively participate in the integration of economic and trade cooperation is both bilateral, regional and international levels. Indonesia also participated actively in the Organization of the Petroleum Exporting Countries (OPEC).

Economic globalization is a situation where each country is free to interact with other countries related to economic activity. Apridar (2012: 268) Economic globalization is a process of economic and trade activities, with countries around the world into one market forces increasingly teritgrasi with unimpeded territorial boundaries of the country. Economic globalization requires the
elimination of all constraints of a country will be blurred, and the linkages between national economies with the international economy more closely.

Economic globalization is the increased economic integration and interdependence of national economies, regional, and local levels around the world through the intensification of the movement of goods, services, technology, and capital across borders. Globalization is a process that involves a series of nets berbagia economic exchanges, political, and cultural, contemporary economic globalization driven by the rapid growth of information in all kinds of productive activities and marketing and the development of science and technology.

Lately, the price of petroleum in the international market is very volatile with an upward trend. In 2011, world oil prices (Brent and Indonesian Crude Oil Price, or ICP) at the level above the psychological barrier of USD 100 a barrel. The surge in oil prices is of course very high concern to almost all countries in the world, both producers (exporters) of oil and consumer countries (importers) according to Nizar (2012). This is because the oil's role is very important as the fuel that drives the economy.

Given the vital role, implications arising from fluctuations in oil prices will also vary. Other empirical studies have also been conducted to see the transmission mechanism of oil shocks on the economy, ranging from the effect of demand, supply, and terms of trade effect. Departing from the fact that the international oil price fluctuations and higher as well as to refer to the results of previous empirical studies, this study also try to assess how the impact of oil price fluctuations on the international market on the economy of Indonesia.

Several macroeconomic variables selected to see the effect of fluctuations in oil prices is economic growth, inflation, money supply, the real exchange rate of the rupiah against the US dollar and interest rates. By looking at the condition of the existing problems, this research entitled "Analysis of World Oil Price Fluctuation Impact on the Economy of Indonesia".

II. Theoretical Framework

Fluctuations in the price of crude oil on the international market should comply with generally accepted axiom that in a market economy, where the prevailing price level is determined by the mechanism of demand and supply (demand and supply mechanism) as the fundamental factors (Nizar, 2002). One of the factors that influence global oil prices is the growth of the world economy. If the global economy tends to strengthen or say going boom, usually followed by stronger demand for oil, so that the world crude oil prices tend to push up, as seen in 1999-2000. Meanwhile, on the supply side fluctuations in crude oil prices is strongly influenced by the availability or supply of oil by producer countries, both countries are members of OPEC and producer countries not members of OPEC.

There are at least six (6) channels that can transmit the impact of oil price shocks (oil price shocks) on economic activity. First, the effects of the supply-side (supply side shock effect). The rise in oil prices led to a decline in output due to the price increase signals a reduced availability of basic inputs to production. As a result, the rate of growth and productivity (Qianqian, 2011). Oil price shocks could cause a rise in the marginal cost (marginal cost) of industrial production, thereby reducing production and increasing unemployment (Brown and Yücel, 2002; Lardic and Mignon, 2006, 2008; and Dogrul and Soytas, 2010).
Second, the effect of the transfer of wealth (wealth transfer effect), which emphasizes the shift in purchasing power (purchasing power) of oil importing countries to oil exporting countries. Third, the real balance effect (real balance effect). If the monetary authorities failed to increase the money supply to meet the growing demand for money, then the balance of the real will fall, interest rates will rise and economic growth slows (Berument and Tasci, 2002; Lardic and Mignon, 2006, 2008; Cologni and Manera, 2008 and Tang et al., 2010).

Fourth, the effect of inflation (inflation effect). The rise in oil prices also led to increased inflation. Crude oil prices were higher will be immediately followed by the rising prices of oil products, such as gasoline and fuel oil were used by the consumer (Cologni and Manera, 2008). In addition there are the indirect effects associated with the company's response and behavior of employees (second round effects). The Company transferred the increase in production costs in the form of consumer prices higher for the goods or services of non-energy, while workers will respond to the increasing cost of living by demanding higher wages (Lardic and Mignon, 2006, 2008 and Berument and Tasci, 2002).

Fifth, the effect of consumption, investment and stock prices. The rise in oil prices have a negative effect on consumption, investment and stock prices. The influence on consumption related to reduced disposable income due to rising oil prices, while investment is influenced by the increase in the cost of the company (Kilian, 2008, 2009 and Henriques and Sadorsky, 2011).

Sixth, the effect of sectoral adjustment (sectoral adjustment effect). Oil price shocks affect the labor market through changes in relative production costs of the industry. If oil prices rise on an ongoing basis, the production structure would change and the impact on unemployment (Nizar 2012). The higher the spread of sectoral shocks, rising unemployment due to the amount of reallocation of labor increases (Lardic and Mignon, 2006, 2008; Kilian, 2008).

III. Research Methods

According to Creswell (2014: 5) is a quantitative research methods to test certain theories by examining the relationship between variables. These variables are usually measured with instruments so that data yang study consisted of figures can be analyzed by statistical procedures.

The data used in this study is a monthly secondary data (time series) in the period 2005: 1-2015: 12, which includes: (i) GDP at constant prices in 2005 (in billion rupiah). To get the monthly data interpolation GDP on quarterly GDP data; (Ii) the price of oil on international markets (US dollars per barrel), with oil prices proxy Indonesian Crude Oil Price (ICP). To eliminate the effect of exchange rates, oil prices in US dollars is transformed into rupiah using the monthly average exchange rate of Rp / US dollar; (Iii) the Consumer Price Index (CPI) as a proxy for the rate of inflation; (Iv) the amount of money supply (M1, in billion rupiah); (V) real exchange rate of the rupiah (RER) against the US dollar and (vi) the nominal interest rate (in percent), which is represented by a benchmark rate of Bank Indonesia (BI rate). Data obtained from the Ministry of Finance, Bank Indonesia, Central Bureau of Statistics, Ministry of Energy and Mineral Resources (ESDM), Bloomberg and CEIC.
Determining whether to use the analysis tool Vector Autoregressive (VAR) or Vector Error Correction Model (VECM) must perform stationary test data. According Widarjono (2009: 347) if data is stationary at the current level, it can be analyzed with the VAR model form level. If the data is stationary at a rate diferensii but not terkoinegrasi, it can use the form diferensii VAR analysis tools. If the data is not stationary at the level diferensii (I) and occurs Johanson cointegration at the time of the test, the tool can use VECM analisinya. Neither the data is stationary at a rate diferensii (2) whether it happens or not cointegration, VECM using analisinya tool.

This study used quantitative analysis methods with models Vector Error Correction Model (VECM) is a Vector Autoregressive (VAR) that tertriksi used for variables nonstationer but has the potential to cointegration. This additional restriction should be given for the existence of the form data is not stationary at level, but cointegrated. Therefore VECM is often referred to as the design for the series nonstationary VAR ties koinegrasi. Thus, in the VECM are speed of adjustment from short term to long term (Eden, 2012: 155).

According to Firdaus (2012: 154) after testing cointegration on the model used, it is advisable to include cointegration equation into the models used. At the time series data mostly have a stationary level in first differences first difference.

Model VECM in this study include some endogenous variables, ie oil prices in real terms (with the notation OIL PRICE), the real GDP (with the notation of GDP), inflation (with the notation CPI), the money supply (with the notation M1), the real exchange rate rupiah (with the notation RER) and short-term interest rates (with the notation INT). Before making estimates VECM models above need to do some testing, among others:

1. Test stationary (unit root test) to prove the stability (normality) patterns for each variable, agarregesi produced are not spurious (false) so it does not produce the wrong interpretation. According to Firdaus (2013: 143) Unit Root Test is a test of all the variables if it is stationary. Test stationary or unit root test is used to look kestasioneran time series data (time series). The use of stationary data will produce a regression false or spurious regression (spurios regression). According to Nizar (2012) test method that is often used is the Augmented Dickey-Fuller (ADF) test and the Phillip-Perron (PP) test.

2. Determination of the optimal lag length to determine the length of the period of a variable is affected by the variable's past and the other endogenous variables. Determination lag merupakan important part contained in the time series model. According to Al Arif and Tohari (2006) determining the optimal lag length in this study using crereria election information recommended by methods Final Prediction Error (PFE), Akaike Information Creterion (AIC), Schwarz Creterion (SC) and Hannan Quinn (HQ).

IV. Result and Discussion

Based on the results of the unit root test (unit root test) using the method of ADF test terlitah that all variables are not stationary or have a unit root level. Therefore, it must be tested on the first difference by using ADF test shows all the variables stationary at a significance level of 5% and 1%.
Table 1. VAR Lag Order Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: WOP RER PDRB M1 IHK BIRATE
Exogenous variables: C
Date: 05/10/16   Time: 09:18
Sample: 2005M01 2014M12
Included observations: 110

<table>
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<th>Lag</th>
<th>LogL</th>
<th>LR</th>
<th>FPE</th>
<th>AIC</th>
<th>SC</th>
<th>HQ</th>
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<td>-8193.994</td>
<td>NA</td>
<td>2.26e+57</td>
<td>149.0908</td>
<td>149.2381</td>
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<td>1519.669</td>
<td>1.70e+51</td>
<td>134.9913</td>
<td>136.0224*</td>
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<td>92.04236</td>
<td>1.28e+51</td>
<td>134.5136</td>
<td>137.3123</td>
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<tr>
<td>3</td>
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<td>58.50851</td>
<td>1.07e+51</td>
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<td>133.6391*</td>
<td>142.6244</td>
<td>137.2836</td>
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* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Data processed (2016)

Determination of the optimal lag length used to determine the length of the period of the response of a variable against his past and to other endogenous variables. Determination of the lag in this study using the approach Likelihood Ratio (LR), Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) and Hannan Quinn (HQ). Lag 1 for SC and HQ criteria, lag 8 for criteria LR, FPE and lag 10 for AIC criteria as indicated with an asterisk (*).

Cointegration test aims to determine whether the variables are not stationary cointegrated or not. Cointegration tests were used in this study in the form of Johansen Cointegration Tests. That their relations in oil prices in real terms (with the notation OIL PRICE), the real GDP (with the notation of GDP), inflation (with the notation CPI), the money supply (with the notation M1), the real exchange rate rupiah (with the notation RER) and interest rates short-term (with the notation INT).

From the estimation VECM model of a picture that changes in world oil prices the previous period has positive influence on changes in oil prices, changes in national ekobomi, inflation, money supply, bunga rate and the exchange rate.

Impluse Respose Function (IRF) is a method that uses to determine the response of an endogenous variable to a certain shock. This is due to eg variable shock-i not only affects variable all i was alone but is transmitted to all other
endogenous variables through a dynamic structure or structures VECM. Dengan lag in other words that the IRF measuring the influence of a shock at a time to the innovation variable endogenous at the moment and in the future.

Decomposition of variance in the model VECM aims to separate the effect of each variable individually innovation to the response received. FDEVD is a method used to see how a change in a variable which is indicated by a change in the error variance is influenced by other variables. So this method can determine which variables influence and which variables have no effect.

V. Conclusion

Fluctuations in oil prices on world markets provide long-term impact on the economy of Indonesia. This influence is transmitted through several macroeconomic variables, namely economic growth, inflation, money supply, the real exchange rate of the rupiah against the US dollar and interest rates. Based on the findings of this study shows that the increase in oil prices in the international market seems to have no longer to be a blessing (windfall profits) for Indonesia. Therefore, the government and all stakeholders (stakeholders) must collaborate in an effort to reduce or eliminate the effect of oil price shocks in the country.

References


(21) https://www.bps.go.id/linkTabelStatis/view/id/1200

(22) https://www.bps.go.id/linkTabelStatis/view/id/907