

Analysis of Oil Import and Exchange Rate in Nigeria

Odo Stephen Idenyi, Anoke Charity Ifeyinwa, Udude Celina Chinyere, Okpoto Sunday I.
Department of Economics, Ebonyi State University, PMB 053, Abakaliki, Ebonyi State

Abstract

This research investigated the relationship between oil import and exchange rate in Nigeria from 1981 to 2015. The objective of the study is to analyze the impact of oil import on the rate of exchange in Nigeria. The study adopted co integration test to ascertain the long run relationship among the variables and vector error correction mechanism to determine the influence of LOIMP on EXR. The findings from the research indicated negative insignificant relationship between oil import and exchange rate in Nigeria in the short run and negative significant correlation in the long run. CUSUM test established that the model for the estimation was stable and impulse response asymptotic analysis revealed a negative impact of oil import on exchange rate in Nigeria. Causality test in this study showed one way causation from EXR to LOIMP. The study concludes that oil import has contributed negatively to developments in the Nigerian economy and the continued depreciation of the exchange rate. Based on the negative result of oil import on exchange rate in Nigeria, the study suggests that government should restructure, transform and legalize all the local (illegal) refineries operating in the Niger Delta region, in addition to making our four refineries operate in full capacity, so as to increase the productive capacity of the country, meet up with the domestic demand for refined oil products in the country, discourage importation of refined products and create employment which is one of the macroeconomic problem that kept the economy in its current state. These outfits should be licensed and structured into efficient production units, underlined by quality control. Government should sincerely initiate policy that will track government and private oil investors who deliberately frustrate refining of crude oil within Nigeria due to their selfish reasons. Policies towards diversification of Nigerian economy should be encouraged and imbibed, this will reduce overdependence on oil revenue and pressure on our local currency.

Keywords: Exchange rate, Oil import, Impulse Response, Nigeria

BACKGROUND

The issue of trade in oil has been adjudged by many scholars and it has been found that fluctuations in the price of oil has been for ages and will continue to exist in the World economy. This is possible due to the imperativeness of oil in day to day activities, as most increase or decrease in prices of oil are determined by the forces of demand and supply. This means that shocks in the prices of oil are mainly explained by fluctuations due to variations in the demand or supply of oil from international oil market, the shock could be positive or negative. But increase in the price of crude oil is globally presumed to have adverse effect on most developing nations like Nigeria. The rise and fall of oil prices has been of immense concern in the world economy due to its upshot in economic indicators, as rise in the price of oil in an oil importing economy tends to reduce growth in the economy, creates shock in exchange rate, affect consumption, domestic investment and even cause rise in the prices of other commodities which in turn brings fiscal and monetary volatility through direct effect on disposable income and prices of domestic tradable items. Also, investment is negatively influenced with the increase in oil price through input prices of a firm with increase in costs of goods.

In the first quarter of the year in 2013 the daily crude oil production in Nigeria fluctuated between 1.86 and 2.1 million barrels per day as against the estimated 2.48 mbpd. This drop was linked to the incessant crude oil theft and vandalization of pipelines. Though oil bunkering started as far back as 2003 when it was done as an act of vandalism to make the oil company pay compensation for oil spill it later graduated to stealing and selling of processed oil products. Oil theft and illegal refinery became escalated and full blown in 2012 after the militants were granted amnesty. In the first half of the year 2012, the Nigerian government estimated as many as 400,000 barrels of crude oil being stolen each day, costing the nation up to \$1 billion per month in lost revenues. Observed was the high oil siphoning business, with the stolen oil quickly making its way into the black market. Some of the oil is delivered to small scale rudimentary refineries in the creeks and mangroves. Here it is boiled to produce low grade diesel fuel, Balogun (2015).

A report by the Nigeria Security and Civil Defense Corps in 2015 revealed that 250 illegal refineries were identified and destroyed with the conviction of 40 perpetrators out of the 118 arrests made in the Niger Delta region. The report has it that Nigeria loses an estimated 300, 000 barrels of crude oil per day to the activities of illegal refiners in the Niger Delta region. Also, as the country cry out for the effects of continued fuel scarcity, the authority destroyed above 400 illegal refineries in three months in Bayelsa State, News Agency of Nigeria (2015).

In 2015, the demand for oil was on a higher side to the tone of 98m barrels each day and a projection of 118m barrels daily in 2030. It has also been noticed that the increase in oil prices raises inflation within a nation.

It is of great opinion that variations in the prices of crude oil are motivated by alterations in the demand for oil. After the period of Breton woods, variations in oil prices had strongly influenced changes in exchange rate either to positive (appreciation) or negative (Depreciation) which in Nigerian context has steadily moved on the negative (depreciation). In an oil exporting economy, appreciation in real exchange rate exists with the increase in the price of oil and exchange rate depreciates with the decrease in the prices of oil, while in importing nation, the reverse becomes obvious.

Exchange rate is literally explained as the price for which a country's currency is exchanged for another's country's currency. In Nigeria, fixed exchange rate is set by apex bank as the official exchange rate while the floating exchange (self-correcting) rate is determined by the interactions of supply and demand in private market. US dollars is the primary determinant of prices of oil in the World economy, variations in the exchange rate (dollar) impinge on the crude oil demand for any economy that uses not US dollar as local currency. There is this assumption that as US dollar exchange rate depreciates the price of oil turns out to be cheap in local currency for consumers in non-US dollar States, hence, improving oil demand for such economy. This increase in demand for oil in such country that uses not dollar for trade to a point controls the World production of oil. However, Dutch disease has been found by scholars to have impacted significantly to the economy of Nigeria. The Dutch disease explains the obvious link between the increase in the economic development of a specific sector and a decline in other sector. The Dutch-Disease is a concept that is used to explain the potentially harmful effect which a natural resource boom will have on the manufacturing sector of natural resource rich country (Rolle and Uffie, 2015). The implication of this rise and fall in these different sectors is that as revenue increases in the growing sector or inflow of foreign aid, the given nation's currency becomes stronger (appreciates) in contrast with other nation's currency in terms of exchange rate. For instance in Nigeria, Dutch disease exists when her export of tradable agricultural products was shifted to export of oil which currently is the thriving sector that supposes to encourage exchange rate appreciation.

From the work of Sascha (2015), it was seen that some authors stated that oil price shock can be transmitted to the exchange rate through two main channels;

- The terms of trade: A negative terms of trade shock (say, a fall in oil prices for an oil exporter) drives down the price of non-traded goods in the domestic economy and thereby the real exchange rate, which is defined as the relative price of a basket of traded and non-traded goods between the domestic and the foreign economy. As prices of non-traded goods may be sticky, the adjustment of the real exchange rate could require nominal exchange rate depreciation too;
- Wealth effects: A negative oil price shock transfers wealth from oil exporters to oil importers, leading to large shifts in current account balances and portfolio reallocation. In order to restore the external net financial sustainability of oil importers (exporters), the real exchange rate has to depreciate (appreciate) following a negative shock to the oil price, in order to improve the non-oil trade balance.

These transmission mechanisms propose that a fall in oil prices should be accompanied by a real depreciation of oil exporters and a real appreciation of oil importers.

STATEMENT OF PROBLEM

Nigeria is an oil producing country and the largest oil producer in Africa with 6th position in OPEC membership. One of the current set back in the growth of Nigeria economy is manifested through the inability of the government to make the oil product available for domestic consumption due to inefficient refining process within the country. This inefficiency was due to the challenges that emanated from some refineries like Warri and Port Harcourt refineries which do not operate at installed capacity causing the economy to rely on importation of oil product. The importation is piloted by private investors and sometimes disguised government investors.

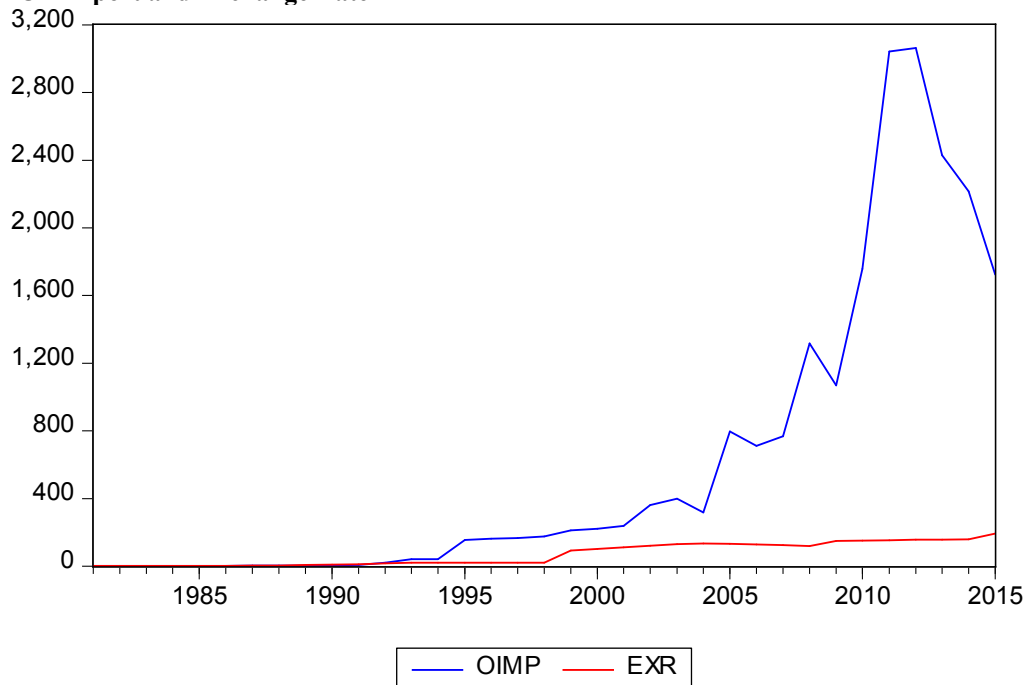
According to Vanguard News paper of 12th September 2016, Nigeria, in spite of the declining economic fortunes, spent N595.5 billion on the importation of fuel in the first half of 2016 against N678.13 billion spent on fuel imports in the first half of 2015, accounting for 16.7% of Nigeria's total import in the first half of 2016. The complexity in the right to use foreign exchange led to depreciation of naira and inflates prices of imported fuel, making the fuel price and other commodities too expensive. The inability of the nation to repair the domestic refineries deteriorated the efforts to address inflationary problem of the economy. This increase in prices of imported fuel had put magnificent pressures on the country's foreign reserves and contributing to the worsening economic situation. As earlier stated, Nigeria is an oil exporting country which places them on the supply side of the economy. The supply side effect of oil in Nigeria assumes a developmental and significant increase in macroeconomic variables of the economy, hence, bringing reduction in poverty level and unemployment and increase in the general standard of living. Despite the huge amount that the government asserted that they expended on oil, the country has depended more on the importation of petroleum oil, thereby pushing the country into demand side of the economy which influenced the depreciation of the Nigerian currency.

According to Ihejirika (2016), Nigeria is faced with different forms of environmental issues, ranging

from oil spillage, desertification, flood, oil pollution and others, mostly in Delta State, a menace which has made life difficult for inhabitants of that area. The menace has resorted in slow poisoning of the waters in the area and destruction of vegetation and agricultural lands making the environment increasingly uninhabitable. Aside the activities of major oil companies, this hazard have also been linked to vandalism and illegal refining in the area. In an attempt to curb the menace, security operatives in the country have embarked on massive hunt of illegal refineries. Unfortunately, these illegal refineries, when discovered, are destroyed, thereby further polluting the environment. In his words, “in the course of our activities, we have destroyed over 200 illegal refineries, and when these refineries are destroyed, this product finds its way directly or indirectly into the rivers, which has a negative impact on environment and the inhabitants of the vandalized areas.

Regrettably, the illegal refineries seems to be greater in number than the legal ones. This means that the revitalization of the illegal refineries instead of destroying them should enhance the production capacity of the country and removing them completely from importing oil since they have excess crude even for the consumption of other countries. The efficiency in exporting oil from the country surely adds value to the Nigerian currency (appreciation), yet, the country imports of oil has been practiced ignoring its influence on exchange rate and other macroeconomic variables.

Trend of Oil Import and Exchange Rate



From the graph above, there exist an inconsistent movement of oil import and exchange rate exhibiting an inverse relationship with exchange rate. This means that increase in oil import brings weakness in Nigerian local currency (depreciation). The question remains, how did we go from being an oil exporting country to oil importing country? How did we fall from being the biggest oil producer in the Sub-saharan Africa to depending on a country like Niger for refined products to satisfy our demand? Why should Nigeria prefer to import oil when they can refine their crude oil putting in place necessary facilities? Despite being one of the world's biggest oil producers, Nigeria imports most of its fuel and is currently facing a severe shortage. According to the appriori expectation, increase in oil export for oil producing countries leads to appreciation of their local currency and oil import leads to depreciation of Nigerian local currency. While in non oil producing nation, importation of oil enhances exchange rate (appreciation).

This study therefore investigates oil import and its impact on exchange rate in Nigeria with other relevant macroeconomic variable from 1981 – 2015.

CONCEPT OF TRADE

John Stuart Mill in History of Economic theory and thought through encyclopedia elucidated the meaning of term of trade as the rates at which the products of one country are exchanged for the products of the other. It is known to us that every country has got its own money. The currency of one country is not legal tender in the other country. So every country has to export commodities in order to import goods indicating the rate at which given volume of exports is exchanged for a given quantity of imports. The rate of exchange or the term of exchange depends upon the elasticities of the demand of each country for the products of the other. A country

gains more from international trade whose exports are more in demand and which itself has little demand for the things it imports. Terms of trade are measured by the ratio of import prices to export prices. The terms of trade will be favorable to a country when the export prices are high relatively to import prices. This is because the products of one unit of domestic resources will exchange against the product of more than one unit of foreign exchange. If, on the other hand, the prices of its imports rise relatively to the prices of its exports, the terms of trade will be unfavorable to the country.

The terms of trade can be expressed in the form of equation as:

$$\text{Terms of Trade} = \frac{\text{Price of Imports and Volume of Imports}}{\text{Price of Exports and Volume of Exports}}$$

Measurement of Change in Terms of Trade:

The changes in terms of trade can be measured by the use of an import and export index number. We here take only standardized goods which have internal market and give them weight according to their importance in the international transactions. A certain year is taken as base year and the average of the countries import and export prices of the base year is called 100. We then work out the index of subsequent year. These indices then show as to how the commodity terms of trade move between two countries. The ratio of exchange in export prices to the change in import prices is put in the form of an equation as under:

$$\text{Commodity Terms of Trade} = \frac{\text{Change in Export Prices}}{\text{Change in Import Price}}$$

Algebraically, it can be expressed:

$$T^c = \frac{P_x^1}{P_x^0} \div \frac{P_m^1}{P_m^0}$$

Where, T^c Represents commodity terms of trade, P_x^1 Represents export price index for the required year, P_x^0 Represents exports price index of the base year, P_m^1 Represents indices of prices of the required year and P_m^0 Represents indices of prices for the base year.

Income Terms of Trade:

It is the desire of every country that it should earn the maximum of income out of international exchange by taking permanent favorable terms of trade. In order to secure maximum gain, the country will try to increase the volume and value of exports and reduce the volume of imports and buy it also from the cheapest market. If the country is having a monopoly in the supply of a commodity and the demand for products is inelastic, then it can fetch more income. In case the terms of trade move against the country, then there will be drain of national income, the commodity terms of trade depend upon the following factors:

- (i) Ratio of import prices to export prices.
- (ii) The volume and value of exports and imports.
- (iii) The condition attached to export and import such as insurance charges, supply of machinery and shipping, etc.

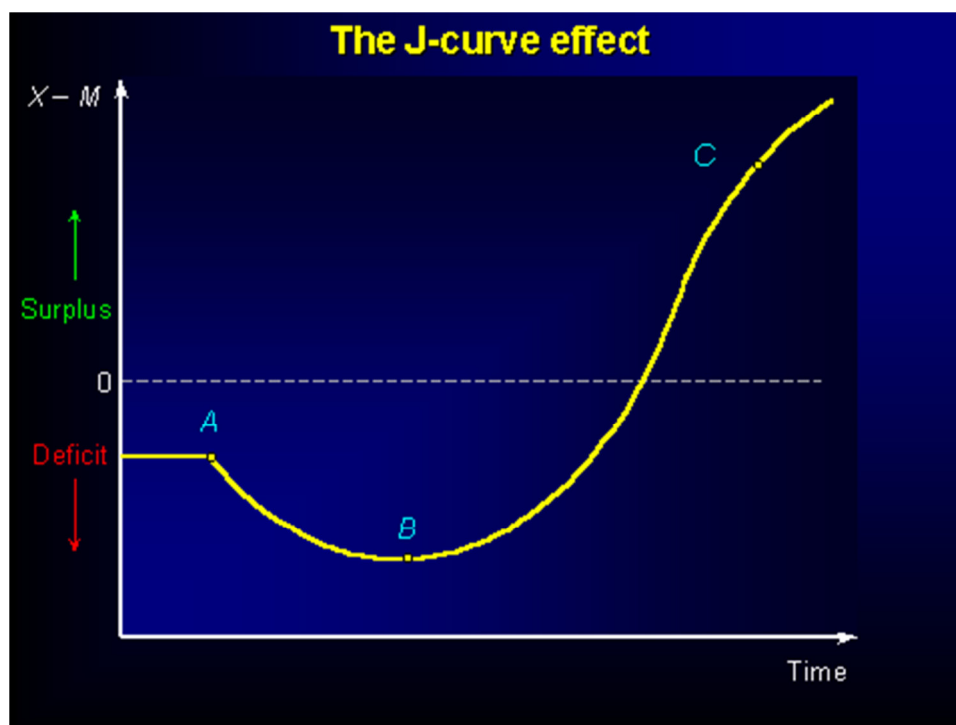
If the terms of trade are favorable which may be due to monopolistic supply or inelastic demand or cheap and better kind of exports, the terms of trade will be favorable and the national income will rise. In case of terms of trade are unfavorable over a period of time, the national income will fall.

THEORETICAL REVIEW

Marshall - Lerner Trade Balance Model

The Marshall – Lerner hypothesis in a work by Anoke, Odo and Ogbonna (2016) asserts that exchange rate depreciation positively influence trade balance on a basis of the BRM condition, known as the Marshall-Lerner condition. This condition states that for a positive effect of exchange rate depreciation on the trade balance, and implicitly for a stable exchange market, the absolute values of the sum of the demand elasticities for exports and imports must exceed unity.

Past data for developed and developing countries have shown that exchange rate depreciation may cause a negative effect on the trade balance in the short run but an improvement in the long run; that is, the trade balance followed a time path which looked like the letter “J” as shown below;



In terms of elasticities, domestically, there is large export supply elasticity and low short-run import demand elasticity. The elasticity approach explains the influence of oil price on the rate of exchange based on the elasticity of import demand of importing country, measuring the responsiveness of quantity demanded to a change in price. The rise in price of oil in importing country will reduce oil import and cause depreciation in the local currency. While a decrease in global oil price tends to increase import and thereby causing appreciation in the currency, Riyadh, Thouraya and Riadha (2016).

Standard Growth Theory

The standard growth theories establishes links between primary inputs and output, not undermining energy inputs such as oil gas, fossil fuel, (Rolle and Uffie, 2015). According to investopedia, the standard growth theory informed that economic growth in per capita basis emanates from capital deepening and total factor productivity growth. The neoclassical growth theory as a standard growth theory explains economic theory that outlines how a steady economic growth rate can be accomplished with the proper amounts of the three driving forces: labor, capital and technology. The theory states that by varying the amounts of labor and capital in the production function, an equilibrium state can be accomplished. The theory also argues that technological change has a major influence on an economy, and that economic growth cannot continue without advances in technology. This postulation is based on the understanding of the importance of the accumulation of capital within an economy and the ways in which people use that capital in economic growth. However, the relationship between the capital and labor of an economy determines its output with technological support.

Nevertheless, production function of neoclassical growth theory is used to measure the growth and equilibrium of an economy, and is depicted as: $Y = AF(K, L)$. "Y" denotes an economy's gross domestic product (GDP); "K" represents its share of capital; "L" describes the amount of unskilled labor in an economy; and "A" represents a determinant level of technology. However, due to the relationship between labor and technology, an economy's production function is often re-written as: $Y = F(K, AL)$.

Increasing any one of these inputs allows a person to see how it would affect the GDP through other macroeconomic variables. However, it is worthy of note that labour, capital and technology does not exhibit the same influence, the returns of both unskilled labor and capital on an economy are diminishing, while technology is limitless in the increase it can add and output it can produce.

EMPIRICAL REVIEW

Dayo (2016) examined price shocks, exchange rate, external reserve and real GDP in Nigeria using data from 1971Q1 to 2014Q4. The variables of interest were analyzed using Structural Vector Autoregressive Model. The author derived from the analysis the impulse response functions and variance decomposition of variables tested. The result of the estimation revealed that oil price shocks had negative effect on external reserve, exchange rate and economic growth. The negative effect of oil price shocks on external reserves and economic growth tended

to be more significant in the long run. The findings also revealed that oil price shocks had a deleterious effect on the macroeconomic performance of Nigeria. The author therefore recommended an effective macroeconomic management is required to reduce the adverse effect of oil price shocks in the country.

Khuram and Liu (2014) identified the impact of oil prices and risk exposure of exchange rate volatility on economic growth in Russian economy on annual data from 1971 to 2012. From the results of their estimations, imports, exports, inflation, interest rate, government consumption expenditure and foreign direct investment have significant impact on real effective exchange rate in the long run and short run. Engle Granger results indicated a long run relationship among the variables and its error correction adjustment mechanism in short runs is significant and correctly signed for Russia

Benhabib, SI Mohammed and Maliki (2014) empirically investigated the relationship between oil price and the nominal US Dollar/Algerian Dinar exchange rate using vector autoregressive model with monthly data for the period 2003-2013. Results from their estimation showed that oil and exchange rate in Algeria is not co integrated, implying no long run relationship between the variables. The VAR results indicated that a 1% increase in oil price would tend to depreciate Algerian Dinar against US Dollar by nearly 0.35%. They authors explained that the negative impact emphasized the Algerian dinar non-oil currency and how the foreign exchange receipts from hydrocarbon exports help swell Algerian public spending that would cater for public budget deficit curtailment.

Riman, Akpan and Offiong (2013) examined the asymmetric effect of oil price shock on exchange rate and domestic investment in Nigeria using time series data from 1970-2010. The econometric technique used for the estimation of independent variables against dependent variables was the Impulse Response Functions (IRFs) and Variance Decomposition (VDC) techniques within a Vector Autoregressive (VAR) framework. Findings from the result revealed that while government expenditure exhibited immediate positive response to oil price shock, public investment, private investment and industrial production exhibited negative response to oil price shock, further confirming the evidence of "Dutch disease" in Nigeria. The variance decomposition analysis further revealed that exchange rate, government expenditure and domestic investment were mainly affected by oil shock, particularly, in the short run. The authors concluded that volatility in crude oil prices has negative impact on domestic investment and industrial development in Nigeria, therefore recommended that the usual practice of sharing oil windfalls to the three tiers of government should be discouraged; rather, the central government should allocate these windfalls to priority sectors of the economy to enhance development.

Oluwatomisin, Ojeaga and Adeyemi (2013) examined the effects of oil price, external reserves and interest rate on exchange rate volatility in Nigeria using annual data covering the period 1970 to 2011 and GARCH model to estimate the relationship between oil price changes and exchange rate. The findings from unit root showed that all the variables were stationary at first difference. The long run relationship among the variables was determined using the Johansen Cointegration technique while the vector correction mechanism result indicated that a proportionate change in oil price leads to a more than proportionate change in exchange rate volatility in Nigeria; which implies that exchange rate is susceptible to changes in oil price. The authors therefore recommend that the Nigeria government should diversify from the oil sector to other sectors of the economy so that Crude oil will no longer be the mainstay of the economy and frequent changes in crude oil price will not influence exchange rate volatility significantly in Nigeria.

Selmia, Bouoiyour, Ayachi (2012) studied the impact of the variability of oil prices on the real exchange rate for a small oil-importing economy (Morocco) and a small oil-exporting country (Tunisia) to compare the effect of fluctuations in oil prices on the volatility of exchange rate depending on the nature of the country. The researchers used GARCH specifications taking into account several effects (symmetrical, asymmetrical, linear, nonlinear, threshold, power, level shift and jump intensity) in order to evaluate the empirical relationship between these variables and identify which of these effects is the most powerful. Results from the findings revealed that for importing or exporting oil economy, the real price of oil is negatively and significantly related to the variability of real exchange rate. By introducing a dummy variable representing the two oil crises and the Asian crisis, the relationship between oil prices and the exchange rate has become more volatile and more persistent for the importing country and less intense for the exporting country, which means that the interaction oil price - exchange rate volatility depends greatly on switching regime.

Omojimite (2011) examined the relationship between oil price shocks and the Nigerian real effective exchange rate and other determinants of exchange rate. The unit root test showed all variables integrated of order I(1) and Johansen cointegration revealed a long run link with 3 co integrating vectors. Other results showed that the price of oil and openness of the economy significantly explain the level of exchange rate in Nigeria. The authors recommended expanded sources of foreign exchange for adequate funding of the market and import demand management as strategies in exchange rate management in Nigeria.

Nikbakht (2010) studied the relationship between oil price and exchange rate in OPEC members in terms of the long run relationship between real oil prices and real exchange rates by using monthly panel of seven countries of OPEC members from 2000:01 to 2007:12. We first test whether or not exchange rates are

cointegrated with real oil prices. Stationary and cointegration tests for pooled series obviously have shown the high power of pooled tests for unit root and cointegration. It is shown that real oil prices may have been the dominant source of real exchange rate movements. Finally, the results shown that, there is a long-run linkage between real oil prices and real exchange rates.

From the review of these existing empirical literatures, gaps are identified in terms of scope, choice of variables and methodology as in the case of Khuram and Liu (2014) that used Engle Granger to describe a long run relationship instead of a causality link, Benhabib, SI Mohammed and Maliki (2014) had no long run relationship from the co integration test, yet used VAR for estimation. This paper will also update the time frame of this study and use the relevant estimation technique to address the causation of oil price and exchange rate.

METHODOLOGY

The theoretical framework for this study is the elasticity demand and supply hypothesis of Marshall – Lerner condition which states that for a currency devaluation to lead to an improvement in the current account or reduction in deficit, the sum of price elasticity of exports and imports must be greater than 1. This theory explains the fluctuations in oil price, exchange rate and prices of other commodities. The variables for this study are; exchange rate as the dependent variable and oil import price, real gross domestic product, non oil import, balance of payment and inflation as the independent variables. Vector error correction mechanism, co integration test and Granger causality is used in the estimation of the variables.

In other to estimate the influence of oil price and exchange rate in terms of importation with the above variables, a functional model is formed as;

$$EXR = f(LOIMP, LNOIMP, INFL, M2GDP, INT)$$

Equation ...is a linearly expressed as;

$$EXR_t = \alpha_0 + \alpha_1 LOIMP_{t-1} + \alpha_2 LNOIMP_{t-1} + \alpha_3 INFL_t + \alpha_4 INT_{t-1} + \alpha_5 M2GDP_{t-1} + \epsilon_t$$

Where, LOIMP means log of oil import price, EXR is exchange rate, LNOIMP refers to log of non oil import, INT is interest rate, M2GDP means money supply % of GDP, INFL is inflation. $\alpha_0 - \alpha_5$ is the coefficient parameters while t-1 is the time differentials.

RESULTS

Table 1: Augmented Dickey Fuller Unit Root Test

Trend and Intercept @ Levels

Series	ADF Test Statistic	5%crit.val	Prob.Val	Order	Remarks
EXR	-2.208178	-3.548490	0.4702	0(0)	Not Stationary
LOIMP	-1.925300	-3.548490	0.6195	0(0)	Not Stationary
LNOIMP	-0.116676	-3.548490	0.9924	0(0)	Not Stationary
M2GDP	-2.697390	-3.548490	0.2439	0(0)	Not Stationary
INFL	-2.989709	-3.548490	0.1497	0(0)	Not Stationary
INT	-3.047900	-3.548490	0.1348	0(0)	Not Stationary

Sources: Researcher's compilation from E-view (version 7.0)

Table 2: Augmented Dickey Fuller Unit Root Test

Trend and Intercept @ 1st Difference

Series	ADF Test Statistic	5%crit.val	Prob. Val	Order	Remarks
EXR	-5.268181	-3.552973	0.0008	1(1)	Stationary
LOIMP	-4.149102	-3.552973	0.0131	1(1)	Stationary
LNOIMP	-5.823307	-3.552973	0.0002	1(1)	Stationary
M2GDP	-5.110688	-3.552973	0.0000	1(1)	Stationary
INFL	-5.499423	-3.552973	0.0004	1(1)	Stationary
INT	-7.430766	-3.552973	0.0000	1(1)	Stationary

Sources: Researcher's compilation from E-view (version 7.0)

Table 1 and 2 above explains the unit root nature and stationarity of data for variables tested. This was done by ADF unit root test. Table 1 indicated that all variable in the model has element of unit root, further use of this variables in this nature would bring erroneous analysis. On this note, the data for this estimation was differenced in the first order and stationarity was established at first difference.

**Table 3: Co integration Test
 Unrestricted Co integration Rank (Trace) Test**

Hypothesized No. of CE(s)	Eigenvalue	Trace statistics	0.05 crit.val	Prob.*
None *	0.842345	151.6681	95.75366	0.0000
At most 1 *	0.677084	92.55302	69.81889	0.0003
At most 2 *	0.542211	56.38144	47.85613	0.0065
At most 3 *	0.406155	31.37832	29.79707	0.0326
At most 4	0.322011	14.70192	15.49471	0.0656
At most 5	0.068362	2.265938	3.841466	0.1322

Trace test indicates 4 co integrating equations at the 0.05 level, * denotes rejection of the hypothesis at the 0.05 level, ** Mackinnon – Haug – Michel (1999) P – value.

The result of the co integration showed a long run equilibrium correlation among the variables, justified by 4 co integrating vectors noticed from result. This implies that a lasting relationship exist among certain variables estimated in the model.

Table 4: VECM Test

Error correction	Coefficient	Std. Error	T - statistics	P - values
ECT = C(1)	-0.081483	0.035654	-2.285396	0.0346
D(EXR(-1)) = C(2)	-0.042636	0.197441	-0.215944	0.8315
D(LOIMP(-1)) = C(4)	-0.032759	0.017821	-1.838240	0.0826
D(M2GDP(-1)) = C(6)	0.824320	0.594116	1.387472	0.1822
D(INT(-1)) = C(8)	0.596311	0.853915	0.698326	0.4939
D(LNOIMP(-1)) = C(10)	0.019833	0.010466	1.895000	0.0743
D(INFL(-1)) = C(12)	0.266333	0.215441	1.236225	0.2323
C = C (14)	0.564274	3.870987	0.145770	0.8857

Based on our interest on oil import and exchange rate, the VECM result above showed a negative insignificant relationship of oil import with exchange rate in Nigeria in the short run within the period of study with the coefficient of -0.0327 and p value of 0.0826. This means that importation of oil has made no relevant contribution on the local currency of this economy within the period of study. This is in agreement with the assumption that oil import causes exchange rate depreciation for exporting economy. This negative influence which is obvious on exchange rate is assumed to be a product of mismanagement and crisis within the oil production sector and areas; shifting the country from oil exporter nation to importers of oil; even importing from Niger (a lower oil production nation). Also, the destruction of existing illegal refineries contributes to the low production capacity of the oil sector, leading to importation of oil. According to the result, it will take Nigeria 80 percent to adjust from disequilibrium to stability of economy in the long run as seen by the ECT value of -0.80. This implies that there is greater possibility of the country moving away from any disequilibrium (recession or inflation) or even stagflation as in the recent case of Nigeria economy.

In the long run, oil import was also found to exhibit a negative of influence with exchange rate in Nigeria within the study period as shown by the normalized co integration equation stated below;

$$EXR = -777.03 - 0.503109LOIMP + 0.183640LNOIMP + 18.64344M2GDP + 4.185719INFL + 9.556646INT$$

The implication of this result is that even in the long run importation of oil has yielded any benefit for Nigerian economy, especially with cogent evidence that the country can produce at maximum capacity if the so called illegal refineries is restructured and legalized. This will discourage corrupted government and private investors that encourage importation of oil for their selfish purposes. in the long run also, non oil import, money supply percentage of GDP, inflation and interest rate would adjust simultaneously to equilibrium through the production and prices of other commodities in the country.

CUSUM Test

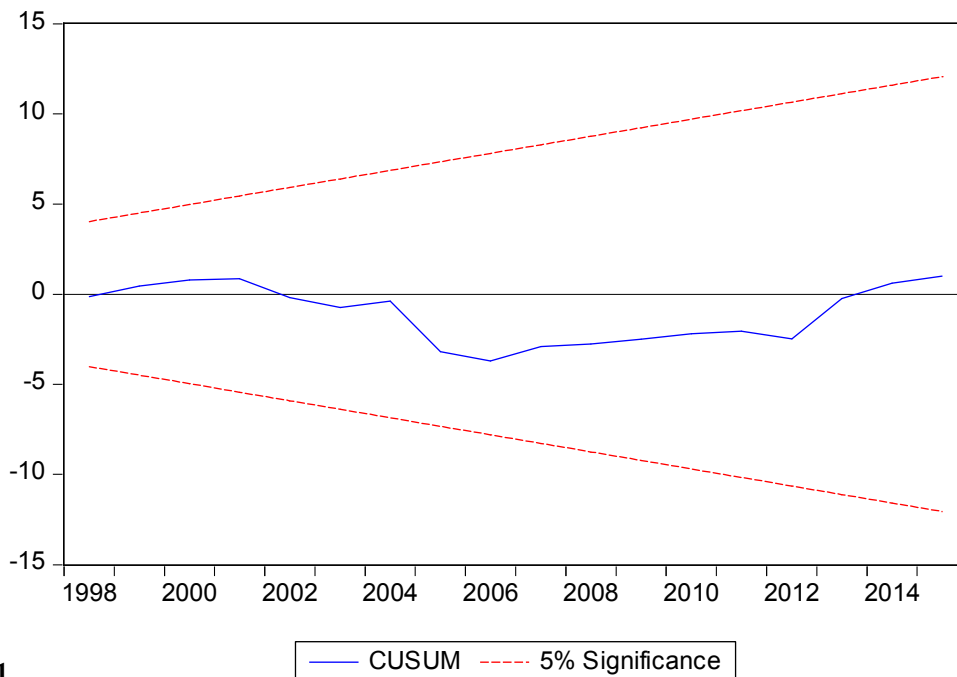


Figure 1
 The CUSUM test identified the stability of model used in the estimation of variables. By this figure above, the regression line lies in between the critical lines, implying that the model used was fit for estimation.

Impulse response of Oil Import and Exchange Rate

Response to Cholesky One S.D. Innovations ± 2 S.E.

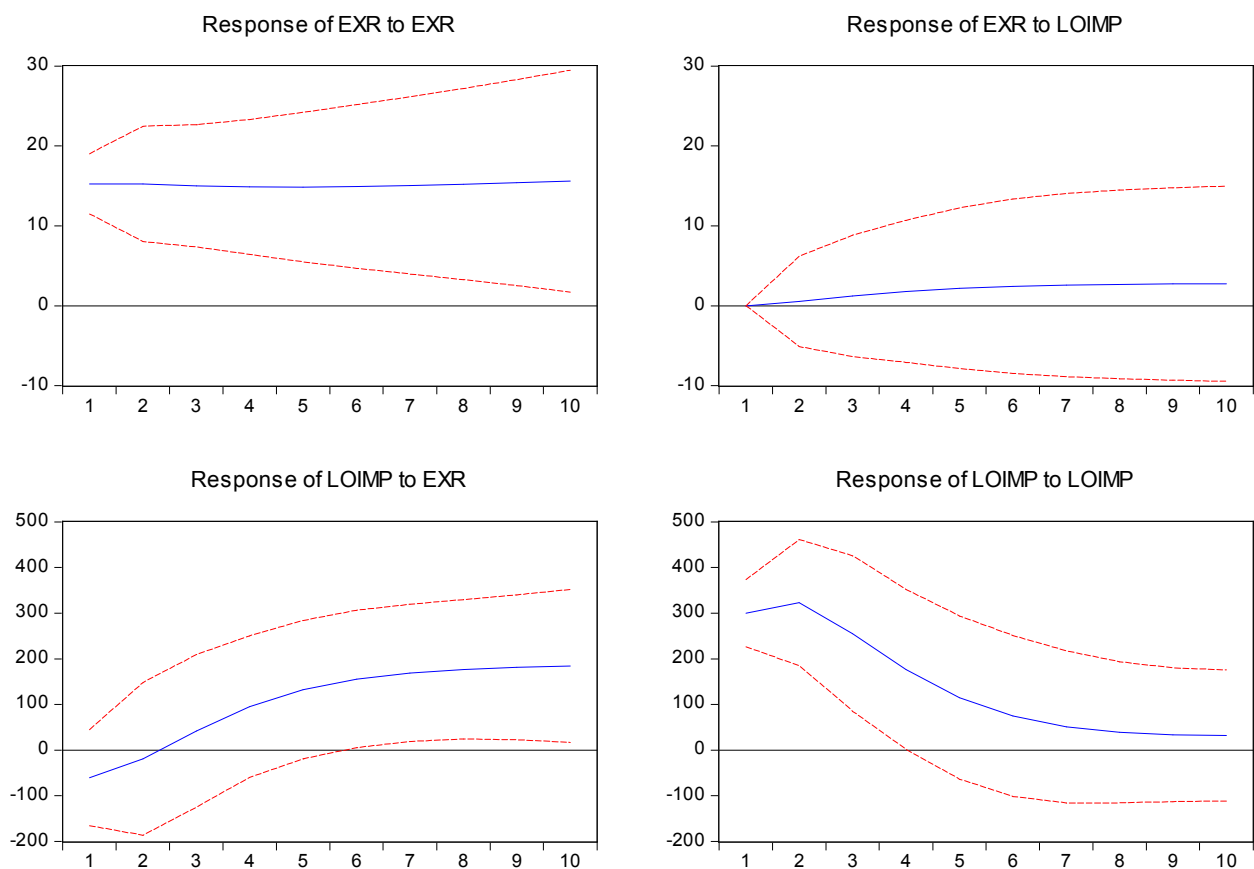


Figure 2
 Figure 2 above analyzed the dynamic responses in the time series model, showing the reaction in exchange rate to a deviation shock in price of oil imported. From the figure also, the response from EXR to

LOIMP had an indifferent reaction between the variables as indicated by decision lines, while reaction of LOIMP to EXR showed negative effect as shown by the decision lines dropping at the negative side of the decision lines. This finding is supported by the negative result both in the short and long run generated by the VECM estimation in table 3 above.

Table 5: Causality Test

Pair wise Granger Causality Tests			
Null Hypothesis:	Obs	F-Statistic	Prob.
LOIMP does not Granger Cause EXR	34	0.18331	0.6715
EXR does not Granger Cause LOIMP		4.49002	0.0422
LNOIMP does not Granger Cause EXR	34	0.98172	0.3294
EXR does not Granger Cause LNOIMP		3.29039	0.0794

From the causality test, a uni directional causation from exchange rate to oil import existed supported by the Pvalue of 0.0422. This means that variations in exchange rate have a reasonable influence on the increase or decrease in oil import.

Conclusion and Recommendation

The existence of the illegal refineries should be seen as a manifestation, not necessarily of criminal intent, but of survival initiatives that should not be suppressed. Rather, such initiatives should be harnessed within the ambits of the law. Minimizing the problem of unemployment entails creating opportunities and encouraging independent initiatives of the people, across the country. There is no doubt that the illegal refineries provide employment for some people in the area, ironically, reputed for its poverty, rather than affluence. Hence, an ingenious transformation of the make-shift refineries could provide further employment for the people and redirect their energies from social vices, which pose threat to national security, to more productive ventures, ([FinIntell](#) (2017)).

More so, the transformation of these tagged illegal refineries will surely increase the capacity production of oil in the country and as such total avoidance of import of oil and geometric increase in oil export which will stimulate exchange rate appreciation. However, Nigeria has not met the standard as oil exporting country which should be a boost to the appreciation of the local currency. The study therefore concludes that oil import in Nigerian economy has not contributed positively to the appreciation of Nigerian currency.

Based on the negative result of oil import on exchange rate in Nigeria, the study suggests that government should restructure, transform and legalize all the illegal refineries in the Niger Delta region of Nigeria to enable increase in the production capacity of the country, and meet up with the demand of refined oil users in the country and create employment which is one of the most macroeconomic problem that kept the economy in its current state. These outfits should be licensed and structured into efficient production units, underlined by quality control. The restructuring of the make – shift refineries will stimulate business interest, encourage foreign investment, increase export and foreign reserve and in turn lead to exchange rate appreciation which brings stability to most economic activities. Another recommendation is that government should sincerely initiate policy that will track government and private oil investors who deliberately discourages refining of crude oil in Nigeria due to their selfish reasons. Policies towards diversification of Nigerian economy should be encouraged and imbibed, this will reduce overdependence on oil revenue and pressure on our local currency. In diversifying to other productive sector of the economy, macroeconomic problems like unemployment, poverty etc will be addressed. The research recommended more that a policy execution on import demand should be established to check the level of import and a corresponding demand for US dollar. This has also become a concern to many Nigerians as some have opined that illegal refineries should be legalized to boost oil supply, create employment opportunity in the country and as well save the environment from further pollution.

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