OIL PRICE SLUMP AND EXCHANGE RATE MANAGEMENT IN NIGERIA

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ABSTRACT

This paper examined global oil price slump and exchange rate management in Nigeria. Both supply and demand factors have played a role in the sharp price decline since June 2014. Risk to financial stability has increased in Nigeria particularly the foreign exchange market given global financial linkages and the slow accretion to the foreign reserve. Crude oil price exerted a significant impact on the dollar/naira exchange rate with a significant t-value and coefficient consistent with expectation. Generally, changes in exchange rate needed to be guided by the objective of aligning the exchange with fundamentals to preserve external competitiveness. This is to avoid the risk of a forced adjustment similar to that experienced in the mid 1980s. In response, Nigeria as an oil exporter and import dependent economy, aimed at smoothening out the adjustments by curtai\ling fiscal spending abruptly. The fall in oil prices provided an opportunity for the country to decrease energy subsidies and use the savings towards targeted transfers. These developments demand increased vigilance on and synergy of economic variables for all round growth and development. Also, the need to diversify the economy among other policy measures cannot be overemphasised.

1. Introduction

Oil exporting countries are witnessing another round of dwindling income and prices as a result of glut in the international oil market. This has gone to justify the fear prevailing and often canvassed against by various economic agencies on governments' reliance on mono-cultural economy for foreign exchange and the need to diversify the economy. The fear is further exacerbated by the uncooperative positions with orthodoxy free market spirit of allowing demand and supply to determine price. There is also a disconnect between what economic planners forward to the National Assembly and what they approve in terms of budgetary provisions. The direct symptoms of oil price slump are depletion of the nation's foreign reserve and increasing pressure on the exchange rate. This of course has a direct bearing on the nation's credit worthiness. This paper mainly examined the effects of oil price slump and exchange rate stability management in Nigeria. The specific objectives were to identify the causes of oil price slump since June 2014; analyze the effects of oil price fall on both the oil exporters and importers of the commodity and examine the effects of oil price slum on foreign exchange in Nigeria. To checkmate these occurrences, all inclusive macro-economic policies need to be put in place to assist in stabilizing the Economy.

2. Concepts/brief Literature Review

2.1 Conceptual Framework

The price of crude oil declined sharply from $108.84 per barrel in June, 2014 to less than $60 per barrel in December, 2014, translating to 50%, without any appreciation. The declining trend is captured in Table 1. The oil price plunge has implication for both the oil importing and exporting countries (for example, US, Japan, Nigeria, Saudi/Arabia) as well as the foreign exchange reserve as a reduced dollar accruing into the coffers of the nation via international trading partners.

2.1.1 Global oil price slump refers to the continuous sliding down of the Oil price in the international energy market. The International market consists of both OPEC and non-OPEC oil producers. The price of crude oil declined from $108.84 per barrel in June 2014 to less than $60 per barrel in December 2014. The declining trend is captured in Table 1. Oil price has fallen by 30-50 percent without any appreciation. This has implications for both the oil importing and exporting countries like Nigeria and the foreign exchange market as a result of reduced dollar accruing into the coffers of the nation via the international trading partners.

Table 1: Global Oil Prices from January to December 2014

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Price($)	110	108	108	107	110	110	114	114	102	98	88	60

Source: Bloomberg .L. P (2014).

2.1.2 Exchange Rate is the rate at which one country's currency exchanges for another. There are various theories of exchange rate purchasing power parity Korsu (2009), Mwega (1993), Beatrice (2001) and Balassa (1964). The two concepts of exchange rate are nominal and real. The nominal exchange rate is a monetary concept which measures the relative prices of two currencies, for example, the Naira in relation to the Dollar. Real exchange rate measures the relative price of two or more tradable goods (export and import). There is a linkage between the two concepts because a change in nominal exchange rate can cause short-run changes in the real exchange rate. A change in exchange rate (devaluation/depreciation) will have effect on depreciating the real exchange rate. Exchange rate is said to depreciate if the amount of domestic currency required to buy a foreign currency increases. According to Takaendesa (2006), an appreciation in the real exchange rate may create current account problems because it leads to overvaluation. Over valuation in turn makes imports artificially cheaper while export relatively expensive, thus reducing the international competitiveness of a country. The swing or fluctuations in the exchange rate will lead to volatility. Mordi (2006) observed that the existence of many parallel markets side by side with the officially recognized foreign exchange markets gives rise to exchange rate misalignment. Obadan (2006) also summarized that on exchange rate as follows:"exchange rate plays an important role in connecting the price system in different countries, thus enabling traders to compare price directly." Changes in exchange rates have a powerful effect on imports and exports of the countries concerned through effects on relative prices of goods. In the light of the above, exchange rates are significant in promoting exports and discouraging imports.

2.1.3 Devaluation/depreciation is a measure to increase foreign exchange receipts by encouraging exports. Devaluation makes the price of exports cheaper in foreign currency and hence attractive to foreign buyers. Devaluation is meant to allocate efficiently foreign exchange receipts among competing import users by letting price mechanism rather than government to make allocation.

In short, the exchange rates perform the role of allocating real resources, particularly between tradable and non-tradable sectors of the economy. In designing balance of payment

programme, efforts are made to ensure that exchange rates are adequately reflected in the domestic price structure facing consumers and the investors. This enables the exchange rate to perform its function of allocating resources between domestic and external sector. Freidman (1958) opined that exchange rate misalignment is a manifestation of economic volatility. The determinants of exchange rate include the following:

- Inflation
- Balance of payments position
- External Reserve
- interest rate movement
- External debt position
- Productivity
- Market psychology and expectation
- Socio-political factors
- Macroeconomic shocks
- Speculative contagion (Korsu ,2009 and Obadan, 2006).

These drivers influence exchange rate dynamics through the demand and supply of foreign exchange which can exert or ease the pressure on the market and cause exchange rate to appreciate or depreciate. The factors leading to devaluation include the following:

- Drawn on external reserve
- Increase in external debt service
- Low productivity
- Macroeconomic shock that precipitates capital reversals, and;
- Other factors like political tension.

According to Zalduendo (2006), in a resource based economy factors such as changes in terms of trade or price of export commodities could have a significant impact on the equilibrium exchange rate. The commodity price plays a significant role in determining a time-varying equilibrium exchange rate in addition to other fundamentals such as trade openness, fiscal balance, net foreign assets etc. The analysis concluded that, in the long term, the Effective Real Exchange Rate (ERER) appreciates with higher oil-related income productivity and Net Foreign Assets (NFA) but depreciates with higher government expenditures. An increase in government expenditure (consumption) would reduce the fiscal balance and consequently weaken the current

account position putting downward pressure on the exchange rate, especially if they are biased towards tradable. In the context of a restricted trade system and administrative prices for many non-tradable, higher demand for tradable would boost their relative prices, causing real exchange rate to depreciate. High Net Foreign Assets (NFA) improved the solvency of the country with high solvency, capital inflows from abroad would increase causing the ERER to appreciate. The income generated from accumulated NFA has a similar impact. It should be noted that commodity prices play a significant role in determining a time- varying equilibrium exchange rate path in addition to other fundamentals such as trade openness, fiscal balance, NFA and relative productivity.

Obadan (2002) stated that after one and half decades of trial and error experimentation with market determined exchange rate it is still far from being accomplished. He concluded that if stable exchange rate is to be achieved; the following strategies need to be taken into consideration:

- ✓ Revival and rebuilding of the productive sectors of the economy to achieve higher capacity utilization and competitive exports.
- ✓ Check round tripping.
- ✓ Increased sourcing of local raw material substitutes and development of the local capital goods industry.
- ✓ Fiscal and monetary discipline and harmony.
- ✓ Promoting foreign capital inflow, especially direct investment.
- ✓ Checking capital flight.
- ✓ Rationalize imports structure to manage demand for foreign exchange.
- ✓ Moral suasion.
- ✓ Use of external stock reserve.

2.1.4 Reserve Management is a process that ensures that adequate official public sector foreign assets are already available to and controlled by the authorities for meeting objectives for a country. It enables a country to provide the backing of domestic currency by external asset. It will assist government in meeting its foreign exchange obligations, liquidity to absorb shocks during times of crisis when access to borrowing is curtailed, and in doing so provides a level of confidence to markets that cannot meet current and future external obligations (IMF, 2014). Table 2 shows the level of Nigeria's foreign reserve over the period of January to August 2014. Improved oil output and exports may improve foreign reserve accretion as presented in Table 2.

Table 2: Nigeria's External Reserve (US Billion Dollar)

	Jan	Feb	Mar	April	May	Jun	July	Aug
CBN Reserves	35.0	32.0	31.0	29.0	28.0	29.0	30.0	30.0
FGN Reserves	2.6	2.7	3.0	3.5	3.2	3.6	3.8	3.7
Federation Reserves	2.2	2.0	2.7	3.8	3.8	3.8	4.4	4.5

Source: CBN, (2014).

2.2 Literature Review

2.2.1 Trend in Nigeria's Foreign Exchange Rate Market

Table 3 shows the exchange rate in Nigeria from January to November, 2014. The Table shows that at the Retail Dutch Auction System (RDAS) and Wholesale Dutch Auction System (WDAS), the naira has slightly depreciated from N157.2 in June to N160 in November.

Table 3: Foreign Exchange Rate (Naira to US Dollar).

	Jan	Feb	Mar	April	May	Jun	July	Aug	Sept	Oct	Nov
DAS?WDAS (USD)	157.29	157.30	157.30	157.29	157.29	157.29	157.29	157.29	157.30	157.31	160.00
IFEM	160.23	164.61	164.61	162.19	162.82	162.82	162.25	161.99	162.93	164.64	171.10
BDC	169.45	171.50	171.50	170.25	167.17	167.17	167.71	170.36	168.64	169.43	175.85

Source: CBN (2014).

At the interbank foreign exchange market (IFEM), it varied from a l ow of N162.23 in June to a high of N171.1 in November 2014. At the BDC, it ranged from a low of N167.1 in June to a high of N175.8 in November. Table 3 shows the foreign exchange rate between the US dollar/Naira while Table 4 shows the foreign exchange cash flows in US dollars. Depreciation in Naira value is not unconnected with the falling price of crude oil at the International oil market.

Table 4: Foreign Exchange Cash Flows (US Million Dollars)

	Jan	Feb	Mar	April	May	Jun	July	Aug
NET FLOWS	-2,109	-3,815	345	-326	-1,648	1,885	1,810	-508
INFLOWS	2,544	2,798	4,753	3,783	3,171	5,712	5,109	3,750
OUTFLOWS	4,652	6,613	4,408	4,110	4,819	3,827	3,299	4,258

Source: CBN (2014).

Table 4 shows the foreign exchange Cash flow from January to August 2014, resulted in net outflow of US$508 million in August, 2014 compared with net inflow of US$1,885 million in July, 2014.

2.2.2 Recent Trends in Oil Price Slump in Nigeria

Oil price has increased since 2003 from less than US$40 to a more than US$100 per barrel by June 2014. The price fell sharply in 2008 before recovering steadily. Since then, prices of oil were volatile during 2011 and 2012 mainly because of the Arab spring and the events in Libya and contributing factors on both supply and demand sides contributed to the persistent high oil prices before June 2014. However, global oil prices started tumbling downward from above $114 per barrel in June 2014 to a low $60 in December 2014 as depicted in Table 5.

Table 5: Actual Market Price for Crude Oil (US Dollar per barrel)

Commodity	June	July	August	September	October	November	December
Nigeria's Bonny light	114.38	109.10	102.28	99.69	8.56	78.7	60.25

Source: CBN (2014).

2.2.3 Effects of Global Oil Slump

Since the last 30 years, oil has played a very important role as a foreign exchange earner and contributed to the budget of many countries. Higher oil price is a booster to the Nigerian economy because substantially Nigeria has been a major oil exporting country. It stands to gain from increase in prices and losses when price decrease, this will also affect the foreign reserve and foreign exchange. Generally, global oil price slump can affect the economy in the following ways:

- It provides opportunity for oil exporters and importers to decrease energy subsidies and use the savings toward more targeted transfers,
- Oil exporters will want to smooth out the adjustment by not curtailing fiscal spending abruptly.
- Countries that do not have much savings funds and strong fiscal rule, budgetary and exchange rate pressures are important
- It increases risks to financial stability via pressure on the national currency but remain limited given global financial linkages. These developments demand increase vigilance all around.

- Emerging markets stand to benefit from higher household income, lower input costs and improved external position. According to Arezki, Loungani, Vander Ploeg and Venables (2014), in their recent assessment of the oil price decline, the Bundes Bank estimated that a fall in oil price of $10 leads to 0.2 percent increase in GDP in a year, and the French authorities estimated that the same price decline would raise GDP by 0.1 percent in two years .

- Oil exporters will get less revenue, and the budget and external balances will be under pressure. For example in Nigeria, Africa's largest oil producer, the decrease in world oil prices has led to lower budget revenues which has created room for higher tax receipts which has in turn lowered investment spending in all sectors of the economy. These are mirror images of what happens in oil importing countries.

- The slump in oil price would, if sustained, act as a stimulus to growth in the major trading partners of oil exporters like in UK, China, India and other main trading partners via its effect on costs of production and real income.

- Decrease in the cost of production of final goods and in turn on profit and investment.

- The effect of the rate of inflation both headline and core inflation.

3. Methodology

Secondary source of data obtained from the Central Bank of Nigeria was employed in this study. Information such as the global oil prices, Nigeria's external reserve (US Dollar), foreign exchange rate and actual market price of crude oil were accessed.

The study utilized both descriptive and Ordinary Least Square (OLS) regression analysis. The descriptive analysis involved the use of tables and percentages. The empirical model (OLS) was used to determine the effects of oil price slum on foreign exchange in Nigeria. The OLS regression analysis equation is expressed thus: $Y = b_o + b_1x_1 + b_2x_2 + b_3x_3$

Where:

Y = Exchange rate (BDC-Dollar)

bo = coefficient of explanatory variables

x_1 = crude oil expenditure

x_2 = oil price

x_3 = lag BDC-Dollar

4. Results and Discussion

4.1 Causes of Global Oil Price Slump

Both supply and demand factors have played an important role in explaining the sharp 30 to 50% price decline. On the demand side the unexpected lower demand between June and December 2014 which accounted for 20 to 25 percent of price decline. The declining level of demand for crude particularly in some of the emerging economies due to stifling growth is a contributory factor.

On the supply side- surprise increase in oil production (shale oil and gas) due to faster than expected recovery in the middle east which include Libya oil production in September 2014 and unaffected Iraq production despite the crisis, in that country. Saudi Arabia the biggest oil producer in OPEC action of publicly announcing its intention not to counter the steadily increasing supply from both OPEC and non-OPEC producers of crude oil.

The decision of OPEC members to maintain a production ceiling of 30 million barrels per day led to dramatic drop (Arezki and Blanchard, 2014). The literature pointed to 'financialization' and other commodities considered by financial investors as distinct asset class and 'speculation' as a contributor to the price decline. However, there is little evidence to support this. The International Energy Agency (IEA) reported that crude oil inventories have reached their highest level in two years, suggesting price increases, not price decline.

The nuclear deal balance between Iran and the West allowing Iran crude oil into the international market is also a factor. In fact, new and cost efficient technology for crude

exploration and exploitation cannot be overemphasised. In addition to the above there is a compendium of many conspiracy theories related to the case of the oil glut.

4.2 Response of Oil Exporters

The exception is the shared opportunity provided by oil prices to reform energy subsidies and energy taxes. The size of the shocks faced by all oil exporters as a proportion of their economy is much larger than for oil importer's.

Low prices provide a great opportunity to remove subsidies at less cost. For example India was able to remove diesel subsidies recently, and there was no protest because the price did not rise. The contribution of oil revenue to fiscal revenues is typically much higher. Countries like Venezuela and Nigeria get lower fiscal revenue and Nigeria's currency has been depreciated by 13% this year since November at the official rate. The CBN intervened to stamp out speculation by baring Deposit Money Banks (DMB) from holding dollars. It imposed harsh restriction on currency trading in a move to stem naira fall.

4.3 Effects of Oil Price Slump on Foreign Exchange Rate in Nigeria

Empirical Data Analysis

This section of the paper corroborates what is presented previously in form of literature. Data were collected on two variables namely oil price slump and the exchange rate of the Naira. Johansen co –integration test was carried out to assess how the oil price slump affects the value of the Nigerian national currency, the Naira. The regression result is presented in Table 6.

Table 6: Regression Estimate

Dependent Variable: BDC_DOLLAR
Method: Least Squares
Date: 11/09/15 Time: 13:51
Sample (adjusted): 2 104
Included observations: 103 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	3.628155	7.997245	0.453676	0.6511
CRUDE_OILEXP	3.026546	3.579560	0.845508	0.3999
OILPRICE	-0.011433	0.026668	-0.428706	0.6691
LAGBDC_DOLLAR	0.943861	0.036980	25.52328	0.0000

R-squared	0.885328	Mean dependent var	150.4710
Adjusted R-squared	0.881853	S.D. dependent var	17.12363
S.E. of regression	5.885819	Akaike info criterion	6.421030
Sum squared resid	3429.643	Schwarz criterion	6.523349
Log likelihood	-326.6830	Hannan-Quinn criter.	6.462472
F-statistic	254.7775	Durbin-Watson stat	1.905873
Prob(F-statistic)	0.000000		

The model generally fit well and is adequate with no element of specification bias. In fact the relationship is linear in nature and not equi-proportional. Thus the equation could be written as:

$$\mathbf{Y = 3.62 + 3.02x_1 - 0.11x_2 + 0.943x_3}$$

In Table 6, the value of R^2 showed that about 88 percent of the systematic variation in the exchange rate is accounted for by the three variables in the model. The F statistics probability is less than 0.05 indicating that the model is adequate. In other words, the coefficient of the variables jointly explained the variations in the dependent variable. Also, Durbin-Watson statistics is approximately 2 indicating the absence of first order serial correlation in the residual of the equation.

Although the coefficient of crude oil expenditure was found to be statistically insignificant, the positive relationship on exchange rate confirms the theoretical postulation that there is a relationship between exchange rate and crude oil expenditure. There may be a unilateral relationship from exchange rate to the crude oil expenditure but not the other way round. The coefficient of oil price also was found to be statistically insignificant and shows a negative relationship with the dependent variable. However, the coefficient of the lag value of the

exchange rate has a high magnitude and significant at 1% level which is also consistent with the *a priori* expectation.

Johansen Cointegration Analysis

The result shows the existence of long run relationship between oil price and the lag value of exchange rate of Naira vis- a- vis the US dollar. In Table 7 (trace test) the probability in row one is less than 5% critical value. We therefore reject the hypothesis stating no co integration relations between the two variables of interest and conclude that there is a co integration relationship between the two. In the second row, the hypothesis says there is at most one co integration equation. Since the probability value is 0.14 which is greater than the 5% critical value (0.14>0.05) we do not reject the null hypothesis and conclude there is at most one co integration equation. We follow same procedure to interpret Table 7 called RANK test.

Table 7: Co integration Analysis

Included observations: 99 after adjustments
Trend assumption: Linear deterministic trend
Series: EXCHANGE PRICEOFCRUDEOIL
Lags interval (in first differences): 1 to 4

Unrestricted Co integration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigen value	Trace Statistic	0.05 Critical Value	Prob.**
None	0.118000	14.06044	15.49471	0.0813
At most 1	0.016327	1.629721	3.841466	0.2017

Trace test indicates no co integration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Co integration Rank Test (Maximum Eigen value)

Hypothesized No. of CE(s)	Eigen value	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.118000	12.43072	14.26460	0.0955
At most 1	0.016327	1.629721	3.841466	0.2017

Max-Eigen value test indicates no co integration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Although the regression estimates show that the price of crude oil has a significant impact on the exchange rate regime, the Johansson co integration test proved no co-integration relation between the price of crude oil and the exchange rate regime. This is corroborated by the Rank test and the Trace test in Table 7. A reason to that is the existence of unit root in some of the series. For instance the price of crude oil passed the unit root test at level while the exchange rate has to be differenced to one before it became stationary. That is to say other variables of no less relevance account for explaining any significant change in the Naira and Dollar exchange rate over the study period. The exchange rate pressure is likely to moderate on the back of healthy oil output and export performance. Such developments will be beneficial for inflation moderation in the economy.

4.4 Financial Implication of Oil Price Slump

Earlier study by Arezki and Blanchard (2014) showed that directly and indirectly through the effects of oil prices themselves and indirectly through the induced adjustment of exchange rate. Firstly, lower oil price weaken the financial position of enterprises in the energy sector especially those that have borrowed in US dollars. This, by implication, will weaken the position of banks and other institutions with substantial claim on the energy sector. Secondly, oil exporting economies could lose from low price because demand in oil revenue could hurt their balance of payments.

In addition, price volatility may harm both importers and exporters of oil as it increases for instance, the predictability of marginal cost of production enterprises. The uncertainty regarding their cash flows may induce companies to reduce their investments and limit job creation which can consequently harm economic growth.

Thirdly and overall, the impact of fall in oil prices on banks in oil exporting countries will depend critically on how persistent the fall in price is and its impact on economic activity and in turn on prevailing buffers. Fourthly, foreign reserve as a function of crude price will lead to appreciation of importers of currencies, in particular the dollar, and to depreciation of oil exporter's currencies.

5 Conclusion and Recommendation

Crude oil price at the global level exert a significant impact on the dollar/naira exchange rate with significant t-value and coefficient consistent with expectation. Risk to financial stability has increased putting much pressure on the naira. Both demand and supply factors have played an important role in the sliding of oil price at the global level.

The price of crude oil has been falling at the global level. This has affected not only the accretion to the reserve leading to the devaluation of the naira from #155 to #198 to the dollar at the official level (RDAS). The budget has also been affected. It seems the higher the level of oil price, the stronger is price of the Naira.

There is the need for the diversification of the economy through development of the solid mineral sector, industrial sector and the agricultural sector to help diversify the sources of foreign exchange earnings. However, the critical question is how to go about the diversification? What policy measures need to be put in place? What strategies need to be pursued? Lessons learned from the past should be tapped and utilized appropriately by various levels of government in order to create buffers for the rainy day. Efforts should be intensified for the stakeholders to make sure that foreign exchange allocated to end users, are utilized for the productive sectors of the economy.

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