

Accounting Implications of Oil Price, Exchange Rate and Unemployment on Economic Growth in Nigeria

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Abstract: Holding other variables constant, Exchange rate and unemployment is supposed to have an inverse relationship, is this really the case in Nigeria economy? Do oil price affect unemployment in Nigeria? Our study analyzed the accounting implications of oil price, interest rate and unemployment on Nigeria economic growth using data from 1981 to 2019 using ARDL and VEC model, From the analytical output, our study revealed that all variables have a short and long term association and are statistically significant, Hence we recommended that the government should put up a mechanism to curb unemployment due to the long and short run implication on GDP, and if not properly managed can lead to economic and social vices; The government should formulate policy that are economically friendly in order to encourage local production to boost our export and improve our local currency (Naira) such that as exchange rate increase local production and firms, this will create employment opportunities for our teeming populations; the economy of Nigeria is over reliant on the oil, there is a clarion call to diversify the economy because any radical drop in our oil price will definitely affect our GDP drastically both in the short and long run.

Keywords: Efficient Wage Model, Unemployment, Interest Rate, GDP and Oil Price

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I. Introduction

The number one priority of any government of the world is to improve her economy and Nigeria is not left out, this cannot be done without sufficient fund. Prior the discovery of crude-oil in commercial quantity in 1958 in Nigeria, Nigeria major source of revenue has been from agriculture which was a major source of income and employment. The income generated from Crude-oil has contributed over 70% of government revenue and 95% of foreign exchange earnings (Oduola, 2006). Nigeria has been seen to be the largest oil producing country in African continent and the eleventh in the world (Khadijat & Taophic, 2018). Meanwhile, contrary to the expectations of the positive effect of rising oil prices to economic growth of Nigeria, unemployment has been on the rise. Unemployment is one of the major macroeconomic problem that every economy is trying to reduce to an acceptable level, because if it is not properly tame can lead to social and economic implications for all economies, Hence every government of the world try to put measures and policies in place that help in reduce the unemployment rate (Ahmad, 2013).

Doğrul and Soytaş (2010) studied Turkey economy from 2005-2009 and revealed that oil price and interest rate improve the forecasts of unemployment in the long run. However Ahmad (2013) in studying the Pakistan economy revealed that interest rate have no influence on unemployment, this has prompted us to delve into the research due to the contrary views. Unemployment in Nigeria has been on the rise despite the macro economy policies put in place by government and with the current floating exchange rate and surge in oil price we have deem it necessary to know the accounting implication on the economy. Nigeria is a country that has a population of more than 180 million citizens, and she is endowed with crude oil which ought to have been prosperous and engaged the teeming populace that have the required acumen, willing and ability to work, looking at the values of the natural resources and the generated revenue, it is expected that the generated inflows from the oil ought to have been sufficient enough to provide an enabling industry and working environment for the populace (Manasseh, Felicia, Jonathan, Okoro, Aja, & Kenneth, 2019).

In light of the above, the surge in oil price has affected drastically any economy that depend on oil as a major sources of revenue and Nigeria is not left out, to the best of our knowledge from the empirical literature reviewed thus far, the accounting implication of oil price, interest rate and unemployment has not been applied to the Nigeria economy using recent data covering 1991 to 2019. Mellquist and Femermo (2007) in their study of Sweden economy with respect to the oil price and unemployment using the Granger causality could not assert

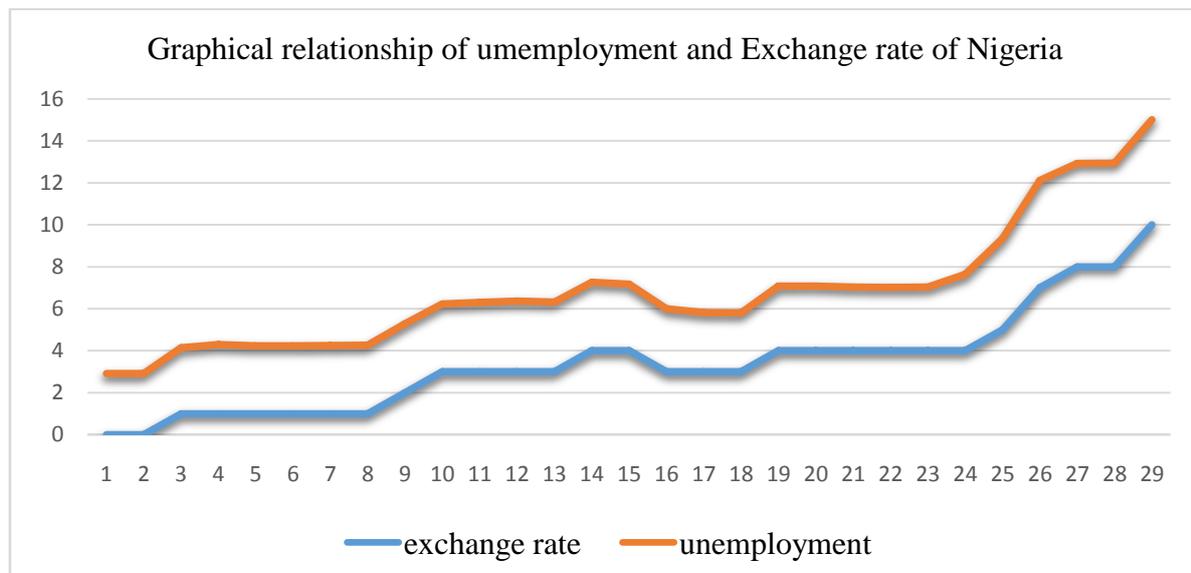
whether an increase in the price of oil will lead to a positive or negative impact on unemployment. Karlsson, Li and Shukur (2018) the top 20 major oil exporters are Saudi Arabia, Russia, Iran, United Arab Emirates, Kuwait, Nigeria, Iraq, Norway, Angola, Venezuela, Algeria, Qatar, Canada, Kazakhstan, and Mexico, Brazil, Colombia, and the United Kingdom. Most of these countries have fixed exchange rate and Nigeria was not left out until 2016 when she adopted a floating exchange rate.

The rest of this paper is arranged as follows: section two review of related literature, section three discussed the methodology and the fourth section discusses the presentation of data, data analysis, and discussion of findings. While in section five is the conclusion and recommendations.

II. Review of Literature

2.1 Theoretical Underpinning

Uri (1996) Oil price and exchange rate can affect the productivity of any economy and in turn affect unemployment, this does not only affect manufacturing, agriculture dependent economy only but affect economy like Nigeria that her major sources of revenue comes from crude. Löschel and Oberndorfer (2009) until real wages drop by the same proportion in labor productivity, firms will continue lay off workers, which will lead to a rise in unemployment and cause a further loss to the economic growth of a nation. With adoption of the floating exchange rate, increase in the rate will help to reduce unemployment although that of Nigeria economy the reverse was the case as shown below.



Source: Researchers' Computations from Statistical Bulletin, (2020)

2.1.1 Unemployment Theory

Keynes (1936) opined that in order to reduce unemployment government most provide enabling environment and provide social and economic policies that will engage the populace productively, further revealed that there is an inverse relationship between unemployment and inflation.

Looking at the demand and supply framework of unemployment, it can be deduce that the level of employment depends on factors of productions such as labor, wages, price level, and prices of other factors of production. On a broad economic level (Macro), unemployment rate is also influence by the local factors such as economic state, business cycles, the technology level, and population demographics, as well as global factors which are the external factors beyond the control of the employer of labor (Doğrul & Soytaş, 2010).

2.2 Exchange Rate Theory

Exchange rate play a great role in an economy, Akujinma, Chijindu and Theodora (2017) the life-wire of any economy is determined by the exchange rate policy put in place and Nigeria is not left out, with the introduction of Structural Adjustment Programme (SAP) in 1986, has made our local currency to loss value in the international market. Prior to the introduction and adoption of SAP which made used of the floating exchange rate, in the sixties and seventies the fixed exchange rate was used by the regulatory system. Akujinma, et al., (2017) cited in Cassel (1981) propounded the purchasing power parity (PPP) theory, as a result of the failure of the fixed exchange rate system, the PPP states that the forces of demand and supply of the market should determine the prevailing exchange rate the rule the transaction.

2.3 Hypotheses Premise

Manasseh et al. (2019) used time series data from 1981 to 2014 to investigate the impact of oil price fluctuation and oil revenue on well-being in Nigeria using multiple regression techniques, revealed that oil price fluctuations have no significant impact on well-being, while oil revenue is observed to have a significant and positive impact on well-being. Although there is long term relationship between the variables, therefore if any of the variables increase so does the other.

Bassey et al. (2016) examined the relationship between unemployment and monetary policy in Nigeria, they used data from 1983 to 2014, vector autoregressive (VAR) was used to analysis the data and found out that a positive shock to policy rate raises unemployment over a 10 quarter period. Hence there study concludes that there is a relationship between monetary policy and unemployment in Nigeria.

Ahmad (2013) used data ranging from 1991 to 2010 of Pakistan economy to investigate the relationship between oil prices and unemployment, making 238 observations of each variable for analysis and employed Toda Yamamoto causality test revealed a significant impact of oil prices on unemployment but found no significant relationship between real interest rate and unemployment.

Löschel and Oberndorfer (2009) analyzed oil price impacts on unemployment of Germany economy, their data covered from 1973 to 2008, using a vector auto regression (VAR) and revealed that oil price increases help increase unemployment in the German labor market. In contrast, it contradicts Manasseh et al. (2019).

III. Methodology

3.1 Data source

We used the vector autoregression (VAR) to addresses accounting implications of oil price, interest rate and unemployment on Nigeria economic growth, which is a more recent employed in literature. This is because the model is useful in an analyzing financial, time series as well as for forecasting, the data employed in this study are Real Gross domestic product (GDP), Exchange rate (EXR), Oil price (OILP) and Unemployment rate (UNE).

3.2 Econometric model (ARDL)

The model for this study is restated below:

$$GDP = f(EXR, OILP, UNE) \dots \dots \dots (1)$$

In order to agree with our Autoregressive distribution lag (ARDL) model, another equation is stated below:

$$\Delta Y_t = \beta_0 + \sum_{i=1}^n \beta_i \Delta y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \Phi_1 y_{t-1} + \Phi_2 x_{t-1} + \mu_i \dots \dots \dots 2$$

} Short -run
} Long -run

Where:
 Short-run coefficients: β_0, δ_i
 Long-run coefficients: Φ_1, Φ_2
 Disturbance (White noise) term: μ_i

3.3 The Error Correction Model

$$ECM = \Delta Y_t = \beta_0 + \sum_{i=1}^n \beta_i \Delta y_{t-i} + \sum_{i=0}^n \delta_i \Delta X_{t-i} + \Phi Z_{t-1} + \mu_i \dots \dots \dots 3$$

Where: $Z_{t-1} = y_{t-1} - b_0 + b_1 x_{t-1}$ are the lagged residuals.

IV. Research Data and Output

Table 1: Descriptive Statistics

| | GDP | EXR | OILP | UNE |
|--------------|----------|----------|----------|----------|
| Mean | 34664165 | 95.53026 | 48.13667 | 4.113333 |
| Median | 23688280 | 101.7000 | 40.76000 | 3.950000 |
| Maximum | 70354216 | 361.0000 | 109.4500 | 6.240000 |
| Minimum | 13779255 | 0.620000 | 12.28000 | 3.420000 |
| Std. Dev. | 20189072 | 96.41795 | 29.61875 | 0.752135 |
| Skewness | 0.669514 | 0.957833 | 0.653477 | 1.940672 |
| Kurtosis | 1.870775 | 3.339030 | 2.249708 | 5.581713 |
| Jarque-Bera | 4.985731 | 6.150167 | 3.690482 | 35.31138 |
| Probability | 0.082673 | 0.046186 | 0.157987 | 0.000000 |
| Sum | 1.35E+09 | 3725.680 | 1877.330 | 160.4200 |
| Sum Sq. Dev. | 1.55E+16 | 353264.0 | 33336.27 | 21.49687 |

| | | | | |
|--------------|----|----|----|----|
| Observations | 39 | 39 | 39 | 39 |
|--------------|----|----|----|----|

Source: Authors Computations using Eview10⁺

Table 2: Lag Selection Criteria

VAR Lag Order Selection Criteria

Endogenous variables: D(GDP)

Exogenous variables: C D(EXR) D(OILP) D(UNE)

Date: 06/23/20 Time: 21:35

Sample: 1981 2019

Included observations: 30

| Lag | LogL | LR | FPE | AIC | SC | HQ |
|-----|-----------|-----------|-----------|-----------|-----------|-----------|
| 0 | -465.3001 | NA | 2.27e+12 | 31.28667 | 31.47350 | 31.34644 |
| 1 | -455.0168 | 17.13883* | 1.22e+12* | 30.66779* | 30.90132* | 30.74249* |
| 2 | -454.9630 | 0.086122 | 1.31e+12 | 30.73086 | 31.01110 | 30.82051 |
| 3 | -454.8251 | 0.211418 | 1.39e+12 | 30.78834 | 31.11528 | 30.89293 |
| 4 | -453.7316 | 1.603754 | 1.39e+12 | 30.78211 | 31.15576 | 30.90164 |
| 5 | -453.7230 | 0.011984 | 1.49e+12 | 30.84820 | 31.26856 | 30.98268 |
| 6 | -453.3006 | 0.563253 | 1.56e+12 | 30.88671 | 31.35377 | 31.03613 |
| 7 | -453.0667 | 0.296252 | 1.66e+12 | 30.93778 | 31.45155 | 31.10214 |
| 8 | -453.0480 | 0.022479 | 1.79e+12 | 31.00320 | 31.56368 | 31.18250 |

Source: Authors computations using eview 10⁺

* 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

The above showed that are variables all settle for one lag, which is used in our analysis

Table 3: Serial Correlation

Breusch-Godfrey Serial Correlation LM Test:

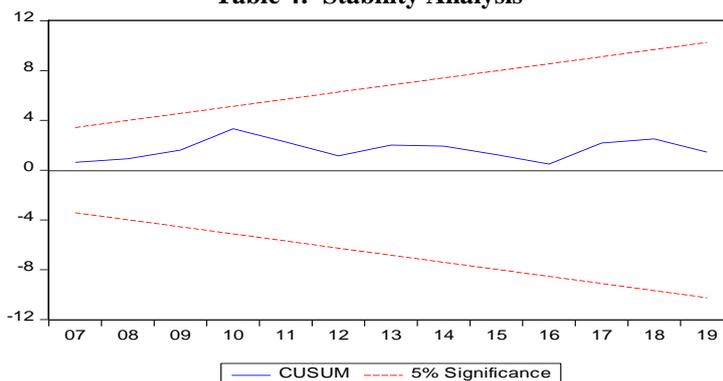
Null hypothesis: No serial correlation at up to 1 lag

| | | | |
|---------------|----------|---------------------|--------|
| F-statistic | 0.310305 | Prob. F(1,12) | 0.5877 |
| Obs*R-squared | 0.857036 | Prob. Chi-Square(1) | 0.3546 |

Source: Authors Computations using Eview 10⁺

The above showed that there is no serial correlation, the valued associated with the Chi-Square statistic (0.3546) is more than 5%.

Table 4: Stability Analysis



The above showed that our model is stable, since the above line is within the bound region

Table 5: Bound Test

| Test Statistic | Value | df | Probability |
|----------------|----------|---------|-------------|
| F-statistic | 8.454323 | (3, 23) | 0.0006 |
| Chi-square | 25.36297 | 3 | 0.0000 |

Source: Authors Computations Using Eview 10⁺

The pesaran table (unrestricted intercept and no trend) at 5% lower bound 4.94 and upper bound 5.73 with respect to our F-statistic showed that there is long term elation between our variables and our model is significant.

Table 6: Error Correction Model (ECM)

Dependent Variable: D(GDP)

Method: Least Squares

Date: 06/22/20 Time: 16:04

Sample (adjusted): 1985 2019

Included observations: 35 after adjustments

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|-------------|-------------|------------|-------------|--------|
| C | 40975.06 | 260185.4 | 0.157484 | 0.8764 |
| D(GDP(-1)) | 1.144879 | 0.324956 | 3.523178 | 0.0020 |
| D(EXR(-1)) | 12613.68 | 11570.26 | 1.090181 | 0.2880 |
| D(OILP(-1)) | 14938.74 | 11525.93 | 1.296098 | 0.2090 |
| D(UNE(-1)) | 273001.3 | 842089.9 | 0.324195 | 0.7490 |
| ECT(-1) | -0.905637 | 0.398109 | -2.274846 | 0.0335 |

Source: Authors Computations Using Eview 10⁺

Our correction term (ECT) is the speed of adjustment to equilibrium which -0.905637 and statistical significant at 0.0335.

Table 7: ECM (SERIAL CORRELATION)

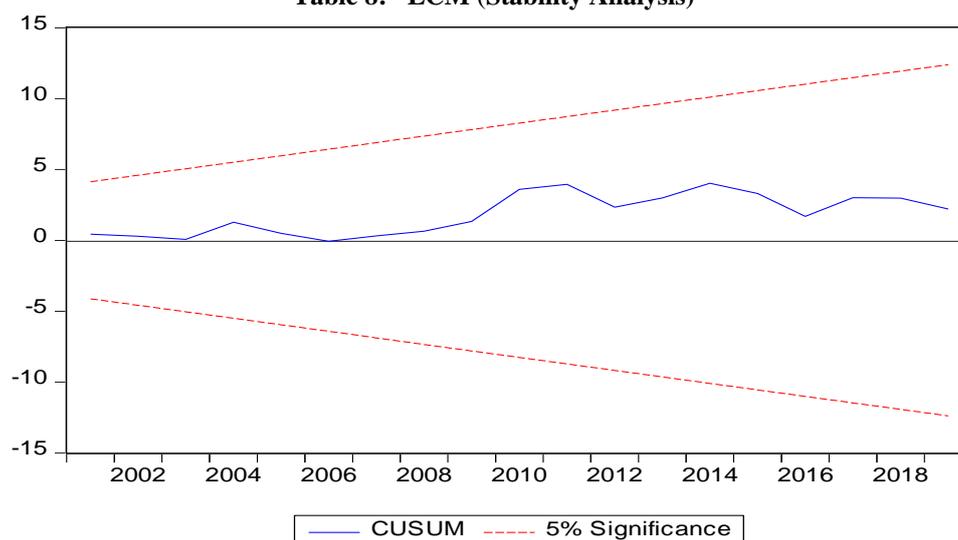
Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: No serial correlation at up to 1 lag

| | | | |
|---------------|----------|---------------------|--------|
| F-statistic | 0.896143 | Prob. F(1,18) | 0.3564 |
| Obs*R-squared | 1.565013 | Prob. Chi-Square(1) | 0.2109 |

Source: Authors computations using eview 10⁺

The above showed that there is no serial correlations among the variables used in the analysis.

Table 8: ECM (Stability Analysis)

The above showed that our model is stable, since the above line is within the bound region

V. Conclusion and Recommendations

The study analyzed accounting implications of oil price, interest rate and unemployment on Nigeria economic growth using data from 1981 to 2019 Indexmundi and statistical bulletin of Nigeria by employing the ARDL model and ECM. Our findings revealed there is a long and short run relationship between our variables, which imply that exchange rate, oil price and unemployment have a great impact on our GDP.

Therefore we recommended that:

- Better economy policy should be put in place by government to curb unemployment because this have a long and short run implication on GDP, and if not properly managed can lead to economic and social vices;
- The government should formulate policy that are economically friendly in order to encourage local production to boost our export and improve our local currency (Naira) such that as exchange rate increase local production and firms, this will create employment opportunities for our teaming populations; and
- Increased in the oil price has really helped in boosting our GDP, however the economy should be diversify because any drastical drop in our oil price will definitely affect our GDP drastically both in the short and long run.

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