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Crude Oil Price Shocks and Unemployment in Nigeria

[1] Tubotamuno Boma, [2] Adeyemi John Olarewaju

[1] Department of Economics, Faculty of Social Sciences, University of Port Harcourt, Nigeria

[2] Institute of International Trade and Development, Faculty of Social Sciences, University of Port Harcourt, Nigeria

Corresponding Author: **Tubotamuno Boma**

Abstract

The study examined crude oil price shocks and unemployment in Nigeria from 1980 to 2019. The study made use of annual data which were collected from CBN statistical bulletins and World Development Index (WDI). The major techniques of analysis adopted include Augmented Dickey Fuller (ADF) unit root test, Autoregressive Distributed Lag (ARDL) approach and Impulse Response Function (IRF). The ADF result showed that while crude oil export was stationary at level, others were stationary at first difference. The ARDL results showed positive long-run and short run effect of oil revenue on unemployment rate. Similarly, oil exports showed positive effect on unemployment rate in Nigeria while exchange rate is negatively related with unemployment rate during the period of study. Based on the results, it was concluded that there is positive response or symmetry shock between crude oil price and unemployment rate. Among others, it was recommended that given that a rise in oil price brings in more revenues to the government, it is important that the government channels realized fund from the sales of crude oil into investment in critical infrastructure facilities such as the building of more energy plants to improve electricity generation which will in turn boost employment generation.

Keywords: Crude Oil Price Shocks, Oil Revenue, Oil Exports Unemployment, Exchange Rate

1. Introduction

Oil price shocks are principally well-defined with respect to price variations occasioning from fluctuations in either the demand or supply side of the international oil market (Wakeford, 2006). These changes have been traditionally traced to supply side disruptions such as Organization of the Petroleum Exporting Countries (OPEC) supply quotas. Changes in global oil prices have significant consequences on the economy of oil-exporting countries. Due to its growth implications, oil exporters have always been concerned about changes in oil prices and even more so when changes are demand-driven, i.e. decline in oil prices is due to a global economy slowdown and technology advancements that reduce oil importers' dependence on oil imports. Oil price shocks are the unanticipated components of a substantial change in the price of oil which is defined as the differential between the expected and realized oil price (Kilian, 2009). The price of oil has witnessed significant fluctuations since 1970; it oscillates between $17per barrels and $26 at different times in 2002 and about $53 per barrel by October 2004 (Philip & Akintaye, 2006) [27]. For the year 2009, oil price average $61.73per barrel (Hassan & Zahid, 2011) [17] and by 2012 it average $72per barrel but falls to as low as $37 per barrel in 2016. The price of oil has continued to trend upward since 2003 as a result of the political crisis in the Middle-East, particularly, the revolutions in some Arab Countries including Tunisia, Egypt, Libya, Yemen and Syria as well as the Iranian nuclear crisis which led to a ban of import of Iranian oil by USA and European countries and the threats of repercussion from Iran (Ijomah, 2015) [20]. Nigerian economy is exposed to oil price shocks since oil contributes over 90% of the total revenues. This shock is so severe that the budget is even tied to a particular price of crude oil and the budget was adjusted in some occasions when there are sudden changes in crude oil prices such as the reduction of budget due to fall in oil prices during the last global financial crisis. This is even worsened due to the fact that despite the four refineries, Nigeria is still exposed to oil price shocks due to massive importation of refined crude oil products. As an oil exporter and importer of refined petroleum products, Nigeria is thus vulnerable to oil price volatility. Meanwhile, the fall in the crude oil price is expected to negatively affect macroeconomic variables in Nigeria in term of unemployment rates due to the mono-cultural nature of the Nigerian economy and the adverse impact is not only felt by the oil sector but also the non-oil sectors of the economy.

However, the issues in oil price volatility and its effect on macroeconomic performance have continued to generate controversies among economic researchers and policy makers. While some scholars such as Ijomah (2015) [20], Akpan (2009) [2] and Aliyu (2009) [5] argued that oil price shock promotes economic growth or has the potential of doing so, others (Alley, Asekomeh, Mobolaji & Adeniran, 2014; Cerralo, 2005) [6, 8] were of the view that oil price shock can inhibit growth. The former were of the view that for net-oil exporting countries, a price increase directly increases real national income through higher export earnings. Whereas, the latter cited the case of net-oil importing countries where oil prices increase lead to inflation and increase input costs. Meanwhile, empirical evidence provides that crude oil which accounts for about 90 per cent of total export earnings, and about 70 per cent of government revenue in annual budgets is expected reduce the rate of unemployment in Nigeria but the reverse is the case. For instance, statistics from the NBS (2017) revealed that unemployment rate which was 23.9% in 2013 rose to 32.6% in 2018. This means that the rise and fall in the prices of crude oil has translated into increase in unemployment (Ewubare & Obayori, 2019; Obayori, Udeorah & Aborh, 2018) [14, 25]. Given the scenario above, one could conclude that, crude oil discovery has had certain impacts on the Nigeria economy both positively and adversely. But the negative impacts outshine the positive. In view of the above, this study carefully examined crude oil shocks and unemployment rate in Nigeria from 1980 to 2019.

2. Literature Review

2.1 The Dutch Disease Model

The Dutch disease theory was coined by The Economist magazine in1977 when the publication analyzed a crisis that occurred in the Netherland after the discovery of vast natural gas deposit in the North Sea in1959. The Dutch disease theory which is also known as the paradox of plenty postulates that higher oil prices would generally alter the production structure of the oil-exporting country to ensure that it concentrates more on oil production and exploration while ignoring the growth of the other sectors of the economy. In other words, the Dutch disease is the failure of many resource-rich countries to maximize benefit from their natural resource wealth to effectively respond to the welfare of the people. The Dutch disease is one of the many frustrations faced by resource rich developing countries in the world today. This is because large proportion of the said oil rich countries are characterized by persistence rise in the general price level, increase level of unemployment, and income inequality amongst others. Rather than contributing to development and inclusive growth, rich deposits of oil has often brought tyranny, misery, and insecurity to these nations (Collier & Hoeffler, 2005) [9]. Put differently, the Dutch Disease indicates that windfalls from a sharp surge in oil price cause inflation in most developing countries because the economy is not well diversified to absorb the inflow of foreign earnings. Therefore, resource pull and spending effects occur when large inflow from oil export hits a less diversified economy (Mieiro & Ramos, 2010) [22]. Meanwhile, the link between oil price and the Nigerian economy can be explained by Dutch disease in this wise. Accordingly, the Dutch disease theory averred that, the oil revenue increases with rising oil price which leads to increase in aggregate demand and subsequent increase in prices and profitability in the non-tradable sector compared to the tradable sector. It causes inflow of capital and labor to the non- tradable sector and accordingly, non-tradable sector becomes stronger than weak tradable sector (Eltejaei & Afzali, 2012) [12]. As a result, the oil price unexpected shock leads to decline in the domestic currency and increase in the exchange rate. This problem can reduce production in various economic sectors and the country's competitiveness in the international arena (Jahadi, 2011) [21]. Moreover, as the oil revenues are in foreign currency, the exchange rate variation affects the economic activities. On one side, the economic and foreign policies are greatly influenced by the exchange rate. On the other side, the exchange rate can affect a country's economic performance and indicators. Also, export is a function of the exchange rate and domestic price level. The exchange rate can affect the price level through the export, import and thus production channels. Increasing of the exchange rate or decreasing of the national currency makes import become more expensive, thus the government will reduce the amount of imports and instead of imports, domestic production will be absorbed. On the other hand, the cheaper export goods lead to attract the most of the markets of other countries and thus increase the competitiveness and export rate (Hosseini & Mirkazemi, 2010) [18]. Of course, the net effect of import and export depend on the elasticity of export and import. According to Marshall Lerner condition, if the sum of the elasticity of export and import are >1, then depreciation of the currency (increase the exchange rate) improves the trade balance and the GDP consequently, but if the sum of the elasticity of export and import are smaller than 1, then the trade balance is better by increasing the value of money (Delavari, Bakhsh & Bozorgi, 2008) [10]. In addition, the influence of investment is through the cost of imported capital goods. The cost of imported intermediate inputs in production increases with raising the exchange rate (devaluation of national currency) which increases the price of goods and therefore increase the price level in the countries. So, the amount of investment has reduced in the countries and it has a negative impact on economic growth. Overall theoretically, the oil price and the exchange rate volatility have different effects and opposite direction on economic growth and the total effects depend on the outcome of both negative and positive effects.

In sum, the Dutch Disease model is the basis on which this study hinged. This is because the theory states the basic significance of effective utilization of crude oil revenue in order to achieve macroeconomic target such as increase in economic growth, stable exchange rate and reduction in inflation. But the ups and downs in the prices of oil lead to a disease in the economy that will bring about increase in inflation and unemployment amongst others. Also, as a result the oil price, unexpected shock leads to decline in the domestic currency and increase in the exchange rate. Therefore, the Dutch disease is the theoretical foundation on which the study is based.

2.2 Empirical Review on Crude Oil Price Shocks

Tubotamuno and Ewubare (2022) [29] examined crude oil price shocks and selected macroeconomic variables in Nigeria from 1980-2019. Annual data were collected from CBN statistical bulletins and World Development Index (WDI). The main technique of analysis is the Impulse Response Function (IRF). The technique of Augmented

Dickey Fuller (ADF) unit root test was used to ascertain the order of integration of the variables before they were subjected to the IRF. The empirical results showed that, there is a symmetric shock between crude oil price and gross domestic product. But an asymmetric shock between crude oil price and inflation rate.

Ewubare and Tubotamuno (2022) [13] examined crude oil and economic growth in Nigeria from 1980-2019. The study utilized annual secondary data collected from Central Bank of Nigeria Statistical Bulletin and utilized the unit root test and autoregressive distributed lag (ARDL) model. The result showed that; there is positive long-run and short run relationship between crude oil revenue and gross domestic product. But a negative relationship exists between crude oil exports and economic growth in Nigeria during the period of study.

Ibrahim (2020) [19] applied a nonlinear approach to explore the asymmetric impact of oil price on inflation in Egypt from 1960-2017. The results of the nonlinear ARDL model, confirmed the existence of co-integration which means that there is a long-run equilibrium relationship between inflation, oil prices, GDP, and money supply, in the Egyptian economy. Results also captured short-run and long-run asymmetric impacts of oil price increases and decreases on inflation. These results impose challenges that minimize the ability of the Central Bank of Egypt in controlling inflation rates in the short-run because changes in oil prices, which positively affecting inflation, are determined globally and outside the effective area of domestic monetary policy.

Raifu, Aminu and Folawewowe (2020) [28] investigated the effect of changes in oil prices on unemployment rate in Nigeria, using real oil prices of Brent and West Texas International with linear and nonlinear autoregressive distributed lag (NARDL) estimation methods. Findings from linear ARDL show that changes in oil prices have little or no significant effects on unemployment rate. The NARDL results indicate that an increase and a decrease in oil prices have an insignificant positive effect on unemployment in the short run. However, in the long run, an increase in oil prices worsens unemployment situation, while a decrease has insignificant reducing effect. We also find evidence of a long-run asymmetric relationship between oil prices and unemployment.

Nusair (2020) [24] examined the asymmetric effects of oil price changes on employment in Canada and the USA using ARDL and NARDL estimation methods. The results based on ARDL showed that changes in oil prices had a significant effect on employment in the long run. However, there was no or minor effect in the short run. In the case of NARDL, the results reveal that positive changes in oil prices had a long-run significant and positive effect on the unemployment rate in all cases. The negative effect of oil price changes was only significant on the unemployment rate in the short run.

Alenoghena (2020) [4] used structural vector autoregression (SVAR) approach to examine the effect of oil price shocks on the macroeconomic performance of the Nigerian economy from 1980 to 2018. The results revealed that oil price shocks have significant and negative effects on economic growth and industrial output. Furthermore, while the results show that oil price shocks have a significant positive effect on inflation, the effect is also positive on interest rate and exchange rate, but it is not significant. The results of impulse response function showed a negative effect on output growth, it is positive on inflation, but mild and indeterminate on industrial production, interest rate and exchange rate. Based on findings in this study, the Renaissance theory and the Dutch Disease theories of economic growth apply to the Nigerian economy.

Onyeiwu and Oguntade (2018) [26] examined the impact oil prices on the Nigerian economy from 1980 to 2016 with the use of unit root test, co-integration to test and the OLS. The research found that there is a significant and positive relationship between oil price changes and economic growth in Nigeria. In the short-run, Nigeria was able to have increasing growth because of the high global oil prices, but in the long-run, the inconsistency of oil prices and lack of diversification of the productive base has not really helped the Nigeria economy.

Eagle (2017) [11] examined the relationship between oil price volatility and macroeconomic performance in Nigeria and Angola between 1990 and 2014. The study made used of Structural Vector Autoregressive model, E(GARCH) and Granger Causality Test as estimation techniques. Results from both impulse response function and variance decomposition showed that oil price volatility had marginal impact of Growth Rate of Gross Domestic Product which was used to proxy economic growth. The E (GARCH) result showed that oil price was relatively volatile during the study periods. Also, Pairwise Causality Test showed a bi-directional relationship between oil price and macroeconomic variables in Nigeria, while it showed a unidirectional relationship in Angola.

Akram and Mumtaz (2016) [3] the impact of oil price fluctuations in the economy Norway since the 1980s. They show that oil price fluctuations have contributed to sizable volatility in the economy variables over the period starting from the 1980s. In like manner, Wei and Guo (2016) an empirical analysis of the relationship between oil prices and the Chinese macroeconomic (1996-2014). They found that Interest rate and output responds dramatically to the shocks in oil price. Oil prices changes are found to be useful for forecasting the China's exports in the periods shorter than about two years.

Caldara, Cavallo and Iacoviello (2016) [7] examined that shock in oil supply account for 50 percent of oil prices fluctuation, shocks to global demand account for 30 percent of oil price shocks; they also examined that a lower in oil prices driven by supply shocks depresses economic performance in emerging economies, while it boosts economic activity in advanced economies, thus helping explain the muted effects of oil price changes on global economic activity; they also found the selection of oil market elasticity is essential to understanding the nature of oil price volatility and to measuring the size of the complications of oil price on economic activity.

Akinlo and Apanisile (2015) [1] investigated the impact of the volatility of oil price on economic growth in 20 Sub-Saharan African countries from the period of 1986-2012. These countries were divided into Group A and Group B. Group A consists of 10 oil exporting countries, while Group B consists of non-oil exporting countries in sub-Saharan Africa. Panel data were used for the analysis. Panel pooled OLS, panel fixed effect model and generalized method of Moment model were employed in the estimation for both oil exporting and non-oil exporting countries. The estimation of panel a model consisting of the oil exporting countries

showed that the OPV has a positive and significance effect on the economic growth of oil exporting countries. The result of panel B consisting of non-oil producing countries showed that the volatility of oil price also has a positive and insignificant impact on economic growth.

3. Methodology

This study adopted the quasi-experimental research design. This study utilized annual time series data on the selected variables, covering the study period 1980 to 2019. The data were collected from annual report of World Development Index (WDI), Central Bank of Nigeria Statistical Bulletin as well as the National Bureau of Statistics (NBS).

Model Specification

Sequel to the arguments presented in the theoretical framework and empirical literature, the model for this study was built on the Dutch Disease model. In addition to this, the study applied ARDL and IRF methodological framework. The modified model is specified below:

$$\Delta UEP_t = \alpha_0 + \sum_{i=1}^{p} \beta_{11}\Delta UEP_{t-1} + \beta_{12}\Delta COP_t + \sum_{i=1}^{p} \beta_{12}\Delta COP_{t-1} + \beta_{13}\Delta COE_t + \sum_{i=1}^{p} \beta_{13}\Delta CEP_{t-1} \ldots + \varepsilon_{3t} \quad 3.1$$

Where;

COP= Crude Oil Price Shocks, UEP= Unemployment Rate, = α's and β's are parameter estimates, Δ= Change, t-1= Time Lag, εt = Disturbance Term, Σ= Summation

Analysis Techniques

The unit root test is followed by the test for cointegration to check whether or not the underlying variables have long run relationship. The bounds test approach to cointegration is the approach considered for determining if long run relationship exists between the dependent and independent variables. Formula for test of co-integration is as follows:

- ARDL(p,q)

$$y_t = \alpha x_t + \sum_{i=1}^{p} \beta_i y_{t-i} + \sum_{j=1}^{q} \gamma_j x_{t-j} + \varepsilon_t, y_t \text{ and } x_t \text{ are } I(0)$$

- ARDL(p,q) with a term trend

$$y_t = \alpha x_t + \sum_{i=1}^{p} \beta_i y_{t-i} + \sum_{j=1}^{q} \gamma_j x_{t-j} + \phi t + \varepsilon_t, y_t \text{ and } x_t \text{ are } I(0)$$

- ARDL in first differences

$$\Delta y_t = \alpha_0 + \alpha_1 \Delta x_t + \varepsilon_t, y_t \text{ and } x_t \text{ are } I(1), \text{ and } y_t \text{ and } x_t \text{ are not cointegrated}$$

x_t and y_t = constant terms
a = long run multiplier
B = short dynamic coefficient of the regressors

The null hypothesis of no long run relationship is tested against the alternative hypothesis of long run relationship. The bounds test is carried out with the application of Wald test or f-test. The null hypothesis (H_o)is to be rejected if the calculated F-statistic exceeds the upper critical bounds at 5 percent level. If the computed f-ratio lies between the lower and upper critical bounds, the test is to be regarded as inconclusive. But if the calculated f-statistic is less than the lower critical bound, it suggests that the series are not cointegrated.

4. Results and Discussion

Table 1: Descriptive Statistics for Underlying Series

Year	UEP	COP	COE
Mean	8.999231	0.457127	48.18725
Median	8.500000	0.313050	16.49400
Maximum	14.60000	1.166930	178.4590
Minimum	4.000000	0.139810	0.012000
Std. Dev.	2.938741	0.308323	56.34592
Skewness	0.349155	1.044228	0.820072
Kurtosis	2.145196	2.927521	2.231410
Jarque-Bera	1.979783	7.096212	5.331303
Probability	0.371617	0.028779	0.069554
Sum	350.9700	17.82797	1879.303
Sum Sq. Dev.	328.1755	3.612401	120644.8
Observation	39	39	39

Source: Researcher's Computation from (EViews 12)
Note: UEP= Unemployment rate, COP= Crude oil price and COE= Oil export

The analysis of descriptive statistics of the series in Table 1 indicated that, the mean of unemployment rate (UEP) is approximately 9% while the corresponding standard deviation is 3%. The approximate mean of crude oil price (COP) is 0.46%, while the corresponding standard deviation is 0.31%. Similarly, the approximate mean of oil exports (COE) is 48.19% while the corresponding standard deviation is 56.35%. Based on the analysis above, the standard deviation of UEP and COP were not higher than their respective mean; thus, the variables are normally distributed. But, the standard deviation of the variables COE is higher than it means. Thus, the variable does not converge around its mean. The Skewness test result showed positive values for all the variables. Moreover, based on the analysis of the kurtosis, all the variables were platykurtic relative to normal, since the approximate values for kurtosis are less than 3. This suggested that, the variables have short and thin tails, and their central peaks are lower and broader. Therefore, it was concluded from the statistical properties of the time series that, the variables were largely not normally distributed, which may have resulted from the problem of unit root. This necessitated stability via ADF unit root test.

ARDL Co-integration and Bounds Test

The ARDL Bounds test for co-integration help to determine the long run relationship among the variables in the estimated model. In doing this, the Pesaran and Shin ARDL Bounds test for co-integration was applied in order to determine if the null hypothesis of no co-integration is rejected or otherwise. The results of the ARDL bounds test and long run test are presented in Table 2 below:

Table 2: ARDL Bounds Test Results

Model		F-Statistic = 9.098742
F(COP), (COE)		K = 2
Critical Values	**Lower Bound**	**Upper Bound**
10%	2.592	3.454
5%	3.100	4.088
1%	4.310	5.544

Source: Researcher's Computation from (EViews 12)
Note: INF=Unemployment rate, COP= Crude oil price, COE= Crude oil exports

The bound test for co-integration, using unemployment rate (UEP) as the dependent variable showed that, the f-statistic value of 9.098742 is higher than the upper bound critical value of 4.088 at 5% level of significance using restricted intercept and no trend in specification for the model. The result showed that the explanatory variables (COP and COE) as well as unemployment rate (UEP) are bound by a long run relationship in Nigeria. This means that, the variables included in the model shared long-run relationships among themselves.

Table 3: ARDL Long Run Test Results

Regressors	Coefficient	t-Statistic	P-Value
COP	10.58136	0.741314	0.4708
COE	-0.124323	-0.875129	0.3963
C	1.740956	0.389355	0.7029

Source: Researcher's Computation from (EViews 12)

Table 3 showed the estimated ARDL long run coefficients to determine the relationship between the independent variables (crude oil price and crude oil exports) and the dependent variable - unemployment rate (UEP) in Nigeria. The estimated result showed that, crude oil price (COP) has a positive but insignificant relationship with unemployment rate (UEP) in Nigeria. This means that, a percentage increase in crude oil price (COP) increases unemployment rate (UEP) by 10.58136%. Similarly, the estimated result showed that, crude oil exports (COE) has negative but insignificant relationship with unemployment rate (UEP). This means that, a percentage increase in crude oil exports (COE) will decrease unemployment rate (UEP) by 0.124323%. Given the empirical findings above, none of the explanatory variables impacted on unemployment rate in Nigeria during the period of study.

Short-Run ARDL Estimates

The essence of the error correction estimate of the ARDL model is to determine the dynamic short-run behaviors of the independent variables and as well determine the speed of adjustment of the estimated model. The ARDL estimates and short-run parameters for the estimated model is presented in Tables 4:

Table 4: Error Correction Representation Dependent Variable UEP; ARDL Selected Lags (4, 4, 4)

Regressors	Coefficients	t-Statistic	P-Value
D(UEP-1))	-0.297095	-1.942145	0.0725
COP	17.90520	3.655109	0.0026
COE	-0.20193	-2.746646	0.0157
ECM (-1)	-0.374749	-2.533867	0.0239
C	-0.652422	-0.291462	0.7750
Adjusted R^2 = 0.6494	Prob(F-statist) = 0.0003	Durbin-Watson Stat	2.3398

Source: Researcher's Computation Using E-views 12
Note: UEP=Unemployment rate, COR= Crude oil price and COE= Oil exports

The short-run dynamic model presented on Table 4 showed that, the coefficient of adjusted R-squared is 0.6494. Meaning that, the dynamic model is a good fit. Thus, the variation in unemployment rate brought about by the explanatory variables is about 65%. Therefore, the explanatory power of the estimated model is 65%. Also, the coefficient of the ECM which theoretically must be negative and statistically significant at 5% level of significant, has the hypothesized negative sign and statistically significant at 5% level. Thus, the deviations from the short-term in unemployment rate adjusted to long run equilibrium with the speed of 0.3747. This showed that, the disequilibria in unemployment rate in the previous year were corrected for in the current year at a speed of 37.47%. Moreover, the coefficient of the Durbin Watson (DW) test is 2.3398 which is not too far from 2.0 bench mark; based on rule- of-thumb, it implies that, the model is free from positive first order correlation. Thus, the explanatory variables in the model are not serially dependent (correlated). Therefore, the model is valid for policy making and implementation.

In the meantime, the coefficient of crude oil price (COP) is positively related with unemployment rate (UEP) and statistically significant. This means that a percentage change in crude oil price will increase unemployment rate (UEP) by 17.90520%. Also, given that the probability value of the t-statistic (0.0026) for the coefficient of crude oil price is less than the p-value at 5%; the study concludes that, there is a significant relationship between crude oil price and unemployment rate (UEP) during the period of study.

Meanwhile, the coefficient of crude oil exports (COE) is negatively related with unemployment rate (UEP) and statistically significant. This means that, a percentage change in oil exports will decrease unemployment rate (UEP) by 0.20193%. Also, the probability value of the t-statistic (0.0157) for the coefficient of crude oil exports is less than the p-value at 5%; this implies that there is a significant relationship between crude oil exports and unemployment rate (UEP) during the period of study. The implication of this result is that, revenue from oil exports serves as an injection to the Nigerian economy during the period of study and hence its judicious use will bring about reduction in unemployment rate.

Impulse Response FunctionsResults to Analyse the effect of Symmetric/Asymmetric Crude Oil Price Shocks on Unemployment Rate in Nigeria, 1980-2019

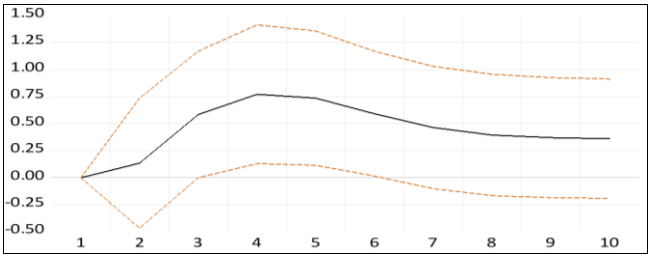

Fig 1: Response of Unemployment Rate to Crude Oil Price

The impulse response analysis using Cholesky (d.f. adjusted) factors showed that, the responses of unemployment rate (UEP) to crude oil price shocks in the periods 1, 2, 3, 4, 5, 6, 7, 8, 9 and 10 are 0.000, 0.14, 0.135, 0.584, 0.77, 0.735, 0.591, 0.463, 0.394, 0.37 and 0.359 respectively. From the figure above, a one standard deviation (SD) shock (COP) innovation to UEP has no noticeable impact on UEP in the first period. But from the 2nd periods to the 5th periods, there was steady and gradual increase in the response. But a gradual decrease occurs between the 6th and the 10th periods. Thus, a one standard deviation (SD) shock (COP) innovation to UEP increases over the periods. Despite the decline experienced, the

decline is positive, as it never goes below the 0.0 point. Meaning that, the value remains in the positive region.

In conclusion, there is positive response or symmetry shock between COP and UEP. Thus, innovations and responses are consistent with intuition, economic theory or a priori expectations.

Therefore, the result is consistent because with increase in crude oil price, there will be corresponding increase in gross domestic product (GDP). The result is in line with the empirical work of scholars such as Ijomah (2015) [20]; Akpan, (2009) [2] as well as Aliyu (2009) [5] who argued that oil price shock promotes economic growth or has the potential of doing so. This is because for net-oil exporting countries, a price increase directly increases real national income through higher export earnings, though part of this gain would be later offset by losses from lower demand for exports generally due to the economic recession suffered by trading partners. Moreover, the impulse response function (IRF) analysis showed that, a one standard deviation (SD) shock (COP) innovation to unemployment rate (UEP) increases over the periods. Despite the decline experienced, the decline is positive, as it never goes below the 0.0 point. Meaning that, the value remains in the positive region. Thus, there is positive response or symmetry shock between COP and UEP. Therefore, innovations and responses are consistent with intuition, economic theory or a priori expectations.

On the contrary, the result is against the finding of Alley, Asekomeh, Mobolaji and Adeniran, (2014) [6] who were of the view that, crude oil price can inhibit growth. This is because, for net-oil importing countries like Nigeria, oil prices increase lead to; inflation, increase input costs, reduced non-oil demand and lower investment.

Post Estimation Tests Results

The study employed the Breusch-Godfrey (B-G) Lagrange Multiplier (LM) test for serial correlation and normality test, heteroskedasticitytest, Wald test, stability test and normality test as the post-estimation tests to validate the ARDL short and long run estimations tests.

Table 5: Post-Estimation Tests Results for Serial Correlation, Heteroskedasticity, Stability and Wald Tests

Test type	Test Stat.	p-value	Critical Value
Serial Correlation	Chi Square (X^2)	0.1095	0.0500
Heteroscedasticity	Chi Square (X^2)	0.2625	0.0500
Stability	t-Statistics	0.5198	0.0500
Wald Test	F-Statistics	0.0000	0.0500

Source: Researcher's Computation from (EViews 12)

The various diagnostic test results conducted to validate the estimated long and short runs ARDL model in the estimated models as presented in Table 5 showed that serial autocorrelation does not exist in the ARDL model. In the same way, the result of Heteroskedasticity test showed that heteroskedasticity is not a problem. Also, the stability test results showed that the estimated ARDL models are stable. Lastly, the Wald test conducted showed that explanatory variables are significant in explaining the depended variables in the ARDL estimated models are upheld.

5. Conclusion and Recommendations

The study used both ARDL model and impulse response function to examine the effect of crude oil price shocks on unemployment in Nigeria from 1980 to 2019 and concluded that; there is a positive and significant relationship between crude oil price shocks and unemployment rate in Nigeria. Thus, crude oil price shocks caused an increase in unemployment rate in Nigeria. It can therefore be said that, the responses of unemployment rate to crude oil price are symmetry. Similarly, crude oil export has negative relationship with unemployment in Nigeria during the period of study in both short run and long-runs. Thus, revenue from oil export will bring about reduction in unemployment rate. Based on the findings, the study recommended that, given that a rise in oil price brings in more revenues to the government via crude oil export, it is important that, government channels realized fund from the sales of crude oil into investment in critical infrastructure facilities such as the building of more energy plants to improve electricity generation which will in turn boost employment generation. Also, there is the need for proper coordination of fiscal and monetary policy for controlling and reducing unemployment in Nigeria.

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