



CRUDE OIL TRADE AND HUMAN WELFARE IN NIGERIA

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ABSTRACT

This study investigated the effect of crude oil trade on human welfare in Nigeria from 1981 to 2017. The data for the empirical analysis was sourced from secondary sources such as the CBN statistical bulletin. The study used Human Development Index (HDI) to capture human welfare as the dependent variable whereas Crude Oil Trade proxies by Crude Oil Revenue (COT) was used as the explanatory variables to capture crude oil trade while foreign direct investment into oil (FDO) and Exchange rate (EXR) were used as a check variable in the models. The study used descriptive statistics, co-integration and error correction mechanism (ECM) modeling techniques for the analyses. The results of the analysis reveals that crude oil trade (COT) has a positive and an insignificant impact on human welfare; foreign direct investment in to oil government expenditure in construction (FDO) has a negatively affected human welfare and exchange rate (EXR) devaluation negatively affected human welfare in Nigeria. Based on the above finding the study recommends that Government should make concerted efforts to revamp the real sectors through judicious use of oil revenue so as to create jobs and reduce poverty which will in turn promote human welfare in Nigeria. Also, the government should ensure transparency and accountability on the part of government officials in the administration of crude oil revenues so that it will promote human welfare development in Nigeria.

Keywords: Crude Oil, Trade, Human Welfare, Nigeria.

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INTRODUCTION

Human well-being according to Maku et al. (2018) is the satisfaction of needs such as food, drinks, accommodation and other things that contribute to body growth. The presence or absence of such satisfaction is certainly better measured by the health levels in the population than by income. Standard economic theory begins by assuming that the goal of a family (or an individual) is to maximize utility given certain constraints. Utility is a construction that represents nothing but the well-being of the home (Glewwe, 1991).

In order to promote human welfare in an economy especially in Nigeria, it has to be supported by the government through the provision of both social and economic amenities and enabling environment. One of the ways in which the government can do this is through the provision of revenue raised from the crude oil. In Nigeria, one of the major sources of revenue is crude oil. According to Ihua, Ajayi and Eloji (2010), oil revenue contributes about 80 percent of Nigeria national income and about 83 percent of federal government revenue.

The relationship between crude oil revenue or trade and human welfare in an economy is that when revenue are raised through crude oil, government usually use the proceeds to provide public goods, maintenance of law and order, defense against external aggression, ensure social and economic maintenance, create an enabling environment by providing infrastructural facilities, create jobs and so on, which will enhance the performance and growth of the of the economy which in turn will lead to economic growth and development as well as human welfare development. A close look at the Nigerian economy shows that crude oil revenue has been on the increase over the years. Total annual crude oil revenue increased on the average from 8.57 billion naira in 1981-1985 to 31.60 billion naira in 1986-1990 to 178.72 billion naira in 1991/1995 to 693.20 billion naira in 1996-2000 to 2625.98 billion naira in 2001/2005 to 4973.82 billion naira in 2006-2010 and by 2011/2017 it has reached 5877.40 billion naira (CBN, 2017).

It is expected that both in theory and practice that these increases in crude oil revenue from crude oil trade should promote the growth of the economy as well as promote human welfare in Nigeria. But in reviewing the Nigerian economy, Appah and Ogbonna (2012) posited that the economy has been bedeviled by perennial underdevelopment, poverty, increased debt burden resulting from poor energy supply and power outages, systematic collapse of industries and infrastructure, lack of proper turn around maintenance in the oil and gas industries, high rate of corruption, militant insurgences, criminal activities, etc. They maintained that the economy is really faced with poor economic indices as evidenced by high rate of perennial and persistent inflation, fluctuating and deficit balance of payment position, low per capita income, poor income distribution and sustained impoverishment. Mismanagement of abundant natural, human and material resources, insatiable greed and lust for excessive wealth, corrupt practices at all levels and political banditry have been the bane of the Nigerian economy.

The persistence of these problems in spite of the various policy measures adopted by various government to stabilize the economy and promote human welfare and also the dearth of literature on the impact of crude oil revenue on human welfare of countries especially in Nigeria, given rise to the basic question: To what extent does crude oil revenue impact on human welfare in Nigeria. The paper is organized into five sections. First, is the introduction, following is the literature review and theoretical framework. Third, the method of study and model estimation is discussed. Fourth is the discussion of results, and finally, conclusion and recommendations.

THEORETICAL LITERATURE

Mercantilist Trade Theory

The Mercantilists were practical men, mainly merchants, who provided the earlier idea on foreign trade. The doctrine was made up of many features. It was highly nationalistic and considered the welfare of the nation as of prime importance. According to the theory, the most important way for a nation to be become rich and powerful is to export more than its import. According to Akpakpan (1999) some of the key figures of mercantilism were Sir Thomas Mum,

a merchant and a director of the East India company, Gerald Malynes, a merchant and government official, Jean Baptise Colbert, Thomas Hobbes, Edward Misselden and Antonio Serra who was the first to analyze and fully use the concept of the balance of trade. It was therefore understood that the most important way in which a country could be wealthy was through the acquisition of precious metals such as gold. This was achieved by ensuring that the export volume was better than the import volume.

Trade must be controlled, regulated and limited. The country was expected to achieve a favorable balance of payments. Mercantilism has proposed tariffs, quotas and other trade policies to minimize imports to protect a nation's trade position. Mercantilism did not favor free trade. Mercantilist belief was a world of conflict, in which the state of nature was a state of war. The need for regulation to maintain order in human and economic matters has been taken for granted. For mercantilists, the world's wealth was fixed. A nation's profit from trade was at the expense of its trading partners. In other words, not all nations could benefit from trade simultaneously. Towards the end of the eighteenth century, the economic policies of mercantilism suffered a strong attack. David Hume criticized the favorable trade balance as a short-term phenomenon that could automatically eliminate overtime. The other nation is likely to withdraw. Mercantilism was also attacked for its static view of the world economy. Adam Smith also criticized the idea that the wealth of the world is made up of the advantages of specialization and division of labor. With specialization and division of labor, the overall level of productivity within a country will increase.

Despite the criticisms behind mercantilism, mercantilism is still alive today. The new mercantilism now emphasized employment rather than having gold. They also postulate that exports are beneficial because jobs are provided nationally. Job supply will lead to a fall in the unemployment rate, suggesting that the production of goods and services would increase, which would imply economic growth. Imports are considered bad since jobs are eliminated and transferred to foreign workers. For the new mercantilist, trade is a zero-sum activity that one country must lose in order to win the other. And that it is not recognized that trade can offer benefits to all countries (Akeem, 2011; Enu et al., 2013).

The Dutch Disease Theory

The Dutch Disease theory originates in the late 1950s when natural gas discoveries in the Netherlands eventually hurt the competitiveness of the Dutch manufacturing sector. The country faces the risk of a de-industrialization process. It is also referred to as the adverse effects on manufacturing of natural resource discoveries. Dutch theory of disease states that the discovery of a (primary) natural resource has negative consequences that result from a large rise in exchange rates, including foreign direct investment, foreign aid or a substantial increase in the prices of natural resources. The impediments of oil revenue to economic growth and development of oil-dependent states at the neglect of other sectors is what is cumulatively called Dutch Disease in the literature of development economics (Ottawa, 2001). The enormous influx of cash resulting from oil tends to foster, overzealous and imprudent expenditure. High oil revenue raises exchange rates, promotes adverse balance of payment as the cost of imports rises. In fact, it kills incentive to risk investment in non-oil sectors, the competitiveness of all non-oil sectors such as agriculture and manufacturing industries would be crowded out.

Specifically, when a country experiences a resource boom due to a tradable resource discovery and/or to an increase in a resource price, it normally undergoes a real appreciation of

its exchange rate and, as a result of rising wages, a relocation of some of the labour force to the resource sector. A real appreciation reduces the international competitiveness of other tradable sectors because resource-based exports crowd out commodity exports produced by those sectors (Krugman, 1987).

Empirical Literature

Very few studies have been carried out on the relationship between crude oil trade and human welfare of countries. Most of the studies looked at the effect of crude oil revenue on economic growth, and very few looked at it with poverty level. For instance, Adedokun (2012) studied the “relationship between oil export revenue and economic growth in Nigeria for 35 years spanning from 1975 to 2009”. The study adopted the Ordinary Least Squares (OLS) method of multiple regression to analyze the data. The study revealed that oil export revenue has a positive and a significant impact on economic growth both in the short-term and long-term in the country. The study further revealed that the primary determinant of foreign exchange earnings in Nigeria was changes in the world crude oil prices.

Abayomi et al. (2015) studied the relationship between oil exportation and economic growth in Nigeria from 1970 to 2012. They employed the co-integration test and VECM modeling technique for the analysis. The study found that “there exist a long run relationship between the dependent variable and the explanatory variables. The study therefore concluded that “exports should not be promoted at all cost, but rather the utilization and allocation of the physical resources and labor complement of the country in the most advantageous combination as between production for the local and foreign markets and that diversification should be seen as an economic management strategy aimed at ensuring stability of incomes.

Adelowokan and Osoba (2015) examined the impact of oil revenues and public spending on the poverty rate in Nigeria from 1970 to 2013. The study used Augmented Dickey Fuller, Engel Granger's co-integration, ordinary least squares and Granger causality to analyze data. The study found that gross domestic product and oil revenues had a negative effect on the poverty rate in Nigeria during the period considered. This revealed that oil revenues, being the main source of income in Nigeria, have a greater impact in ensuring an equitable distribution of income as a means of reducing the level of poverty among its citizens. Unfortunately, these revenues are not channeled in the right direction compared to public spending on capital projects and recurring expenses.

Cuiping (2016) examined the effect of crude oil price fluctuation and economic growth of Kazakhstan using Granger causality and VAR modeling technique for the analysis. The result of the analysis found that the impact of oil price fluctuation on Kazakhstan national economy mainly include gross domestic product (GDP), which will not change, but can make the economic growth slow, through the pull of aggregate supply and cost reduce two ways to make price level rise, increase long-term unemployment, and the effects of monetary policy effectiveness. Overall, although the international price of crude oil and Kazakhstan, the relationship between economic variables are complex, but through the automatic adjustment and the government's macroeconomic regulation and control of the market, oil prices, money supply, price level, Economic growth and unemployment, which is composed of five relevant economic variables such as Kazakhstan economic system is relatively stable in the long run.

Asogwa and Okpongette (2016) used econometric method of OLS and granger causality to analyze the relationship between oil revenue and Nigeria macroeconomic performance from

1981 to 2014. The study found that “oil revenue has a positive and significant effect on economic growth in Nigeria”. The study also showed that oil revenue does not granger cause economic growth. The study therefore recommended the implementation of the petroleum industry bill with alternative sources of revenue for greater economic performance.

Nweze and Edame (2016) empirically investigated the effect of oil revenue on economic growth in Nigeria from 1981 to 2014. The study employed the unit root test, Johansen co-integration test and Error Correction Mechanism (ECM) to analyze the data. The study revealed that “all the variables except lag of government expenditure exerted significant impact on economic growth in Nigeria”. The study concluded that “government should use the revenue generated from petroleum to invest in other domestic sectors such as agriculture and manufacturing in order to expand the revenue source of the economy and further increase the revenue base of the economy.

Lawrence and Victor (2016) used a dynamic analysis of co-integration and granger causality to analyze the relationship between oil revenue and the Performance of the agricultural sector in Nigeria from 1981 to 2014. The study revealed that “oil revenue was not statistically significant in explaining the level of economic growth. The result of the granger causality test indicates that oil revenue does not granger cause agricultural output”. The study therefore recommended that “government should make concerted efforts to revamp the agricultural sector through judicious use of the dwindling oil revenue and foreign investors should be encouraged to go into the agricultural sector in Nigeria.

Nagmi and Moftah (2016) examined the effect of fluctuations of oil price on economic growth of Libya from 2000 to 2015 using Vector Auto Regressive (VAR) and co-integration modeling techniques to analyze the data. The results indicate that “both series are integrated of order one I (1), having a long-term relationship between crude oil price and growth. The estimates suggest that higher oil price has a positive and statistically important impact on the economic growth of Libya. The study recommends that the country’s policymakers should provide the enabling policies that could lead to the diversification of the nation’s economy from oil export (that is, lessen its reliance on petroleum trade) to non-oil export products.

Okonkwo, and Madueke (2016) investigated the impact of petroleum revenue on economic development of Nigeria from 1980 to 2013 using the Ordinary Least Squares (OLS). The results showed that petroleum revenue has an insignificant effect on economic development of Nigeria in the short run. In the long run there is no significant correlation between petroleum revenue and economic development of Nigeria. There is no causal relationship between petroleum revenue and economic development of Nigeria. Government must therefore diversify the economy via promotion and creating enabling environment for non-oil sector development in Nigeria; reduce the size of the public sector and increase budgetary capital expenditure especially in the areas of providing sustainable power supply and means of transportation as well as information technology; intensify efforts aimed at combating corruption; and encouraging the federating units to contribute to the revenue of the country.

Olayungbo and Adediran (2017) examined the effects of oil revenues and institutional quality on economic growth in Nigeria using annual data from 1984 to 2014. The ARDL model used shows that there is a long-term balance between oil revenues, institutional quality and economic growth. The short-term analysis indicates that the institutional quality measured by the corruption index promotes economic growth, while the institutional quality delays long-term economic growth. In addition, oil revenues promote short-term economic growth and reduce it in the long term, confirming the existence of the resource curse hypothesis in Nigeria. Impulse

response analyzes further support ARDL results. Therefore, the article concludes that institutional quality is important for explaining the relationship between oil revenues and economic growth in Nigeria. We recommend the government to establish anti-corruption policies to mitigate corruption and improve institutional quality in the country in order to ensure sustainable per capita growth, protect existing investments and attract new investments in the country in general.

Etelawi et al. (2017) examined the effect of crude oil on the Libyan economy from 1980 to 2012. The study used capital, labor, domestic consumption of oil and oil exports as the explanatory variables whereas gross domestic product (GDP) was used to capture the Libyan economy. The study found that all the explanatory variables were significant at the 0.05 level except the log of labor, which was significant at the 0.0613 level. The signs associated with the variables were consistent with economic theory. The adjusted R square was 0.912 indicating that approximately 91 percent of variation in GDP was explained by the independent variables. There was only limited multicollinearity in the model as all Variance Inflation Factors (VIF) values were less than 10. Breusch Pagan and Anderson-Darling test results indicated a constant variance and that the errors were normally distributed respectively. Similarly, the Durbin-Watson statistic indicated an absence of autocorrelation at the 0.05 level. The resulting elasticities were positive and strongly inelastic, indicating that large changes in each of the variables would be required to dramatically increase GDP. Nevertheless, it is clear that oil will continue to play a leading role in future economic growth and development.

Nwoba and Abah (2017) examined the impact of crude oil revenue on the growth of the Nigerian economy between 1960 and 2010. The study used GDP to proxy economic growth and employed Ordinary Least Squares (OLS) method of analysis to analyze the data. The results of the analysis found that “the extent of economic growth impacted by the oil industries was significant”. The study also found “a long run positive relationship between oil revenue and gross domestic product. It also found that crude oil proceeds and that multinational oil companies in Nigeria have impacted positively on economic growth and development in Nigeria through oil production activities including employment generation both directly and indirectly through value-chain additions.

Trang et al. (2017) analyzed the influence of oil prices on the macroeconomic variables of Vietnam from 2000 to 2015 using a vector auto regression modeling technique. The study found that “a rise in oil prices would lead to higher inflation and budget deficit in Vietnam while its impacts on the gross domestic product growth and unemployment are unclear.

Maku et al. (2018) investigated the impact of petroleum pump price on human welfare in Nigeria over the period 1990 to 2015 using autoregressive distributed lag (ARDL) modeling technique. The result showed that “premium motor spirit price and dual purpose kerosene price exert a long-run negative and significant impact on human welfare in Nigeria while premium motor spirit price, dual purpose kerosene price and inflation rate exert a short-run negative and significant impact on human welfare in Nigeria. The study recommended that Government and it agencies should ensure that petroleum pump prices should be regulated because they have a long way on the market. An increase in the price of petroleum products will lead to market failure because most products use either of these products. Since inflation rate worsen the welfare of people, the policy maker should find a way of control inflation in the system so that the welfare of the people will improve (better-off).

Asagunla and Agbede (2018) examined the contribution of the oil revenue to Nigerian output growth between 1981 and 2014” using the fully modified ordinary least squared method

(FMOLS) to examine the relationship. The study therefore discovered that oil revenue does not have short run impact on the economic activities of Nigeria. However, the long run impact of this policy gave a sterling story, as it was revealed that the persistence rise in oil revenue will ultimately lead to future economic growth of the country. It is however recommended that the government should effectively and efficiently utilize the oil fund into strategic developmental projects so as reduce the rate of poverty and facilitate output growth.

Summary of Reviewed Literature and Research Gap

The study examines the effect of Nigeria's crude oil trade on human welfare in Nigeria from 1981 to 2017. From the literature reviewed, it was observed that some of the works reviewed either examined the effect of crude oil revenue on economic growth, or on macroeconomic performance, or on the industrial output, or on agricultural productivity. This study deviates from these scholars by examining the effect of effect of crude oil revenue on human welfare in Nigeria by regressing crude oil revenue, foreign direct investment into oil and exchange rate from 1981 to 2017. This is the gap the study filed in literature.

METHODS

Data Required and Sources

The data required to examine the effect of crude oil trade on human welfare in Nigeria is tested based on time series data spanning from 1981 to 2017. Accordingly, the data were sourced from the central Bank of Nigeria (CBN) statistical bulletin and national Bureau of Statistics (NBS).

Analytical Framework and Model

The analytical framework of this study mimiced the previous studies such as Maku et al. (2018) with further modifications, who studied the impact of petroleum product price on human welfare in Nigeria. Their model is stated as follows:

$$\text{HDI} = f(\text{PMS}, \text{AGO}, \text{DPK}, \text{INF} \ \& \ \text{INT}) \quad (1)$$

Where:

HDI = Human Development Index (measure in %) a proxy for human welfare;

PMS = Premium Motor Spirit per litre (Commonly Referred to as Petrol or Fuel or especially in the U.S as Gas or Gasoline);

AGO = Automotive Gas Oil litre (popularly known as Diesel);

DPK = Dual Purpose Kerosene litre (popularly known as Kerosene);

INF = Inflation Rate (using consumer's price index and it is measure in %); and

INT = Interest Rate (measure in %).

But the present deviates from these scholars by looking at the effect of crude oil trade on human welfare by using crude oil revenue as a proxy for crude oil trade, foreign direct investment into oil and exchange rate.

Hence, the functional model is specified as:

$$\text{HDI} = f(\text{COT}, \text{FDO}, \text{EXR}) \quad (2)$$

Where:

HDI = Human development index a proxy for human welfare

COT = Crude oil trade proxy by crude oil revenue

FDO = Foreign direct investment into oil

EXR = Exchange rate

Based on equation (1) the explicit econometric form of the model is stated as:

$$\text{HDI} = \beta_0 + \beta_{1t}\text{COT} + \beta_{2t}\text{FDO} + \beta_{3t}\text{EXR} + \mu_t \quad (3)$$

Where; β_0 = the intercept

$\beta_1 - \beta_3$ are the coefficients of independent variables and μ_t = Error term.

Techniques of Analysis

This study adopts descriptive statistics, unit root test, co-integration, and error correction mechanism (ECM) to estimate the link between crude oil trade and human welfare in Nigeria. The study adopts the descriptive statistics because it is used to ascertain the stationarity of the variables. Also, the study employed the cointegration in order to determine the long run relationship of the variables of interest (crude oil trade) of the study on the human welfare (HDI) while the ECM was used to check the short run dynamics of the model, that is, the speed of adjustment.

PRESENTATION AND DISCUSSION OF RESULTS

The results of the analysis are presented and analysed in four phases. First, is the descriptive statistics to ascertain the stationarity of the variables. Secondly, is the stationarity test to confirm whether the series are stationary or not? Thirdly, is the co-integration test and lastly, the short run dynamics (ECM).

Descriptive Statistics

Table 1 below presents the result of the descriptive statistics of the variables employed in the estimations of the model in this study.

Table 1: Descriptive Statistics Results

	HDI	COT	FDO	EXR
Mean	0.236757	2262.194	289.8827	82.78627
Median	0.000000	724.4200	152.4100	92.69340
Maximum	0.532000	8878.970	1124.100	305.7901
Minimum	0.000000	7.250000	3.620000	0.610000
Std. Dev.	0.247949	2694.879	349.8963	80.40635
Skewness	0.085111	0.949420	1.091725	0.713608
Kurtosis	1.044519	2.628912	2.810409	2.868118
Jarque-Bera	5.939860	5.770924	7.405238	3.167107
Probability	0.051307	0.055829	0.024659	0.205244
Sum	8.760000	83701.19	10725.66	3063.092
Sum Sq. Dev.	2.213235	2.61E+08	4407387.	232746.5
Observations	37	37	37	37

Source- Author's Computation Using e-view 9.0

From Table 1, the result shows that the standard deviation calculated for crude oil trade (COT) was the most volatile in the series with a value of 2694.879 while human development index (HDI) was the least volatile variable with a value of 0.247949. The calculated values for the skewness statistic for all the variables; HDI, COT, FDO and EXR were positively skewed, suggesting that their distributions have a long left tail. Also, the kurtosis statistics for all the variables were platykurtic, meaning that their distributions were flat relative to normal distribution. Based on these observations, it therefore means that there is unit root (non-stationarity) in the series. Thus, estimating these variables at level might not give good results, hence, the need to conduct the unit root test. The unit root test is conducted to test whether or not the variables were stationary. The study adopts the Augmented Dickey Fuller (ADF) unit root tests procedures.

Unit Root Test

The results of the unit root test using the ADF are reported in Table 2. The result shows that all the variables HDI, COT, FDO and EXR were not stationary at level but all were stationary in their 1st difference as shown in the table below.

Table 2: Unit Root Test Results

Augmented Dickey Fuller (ADF) Test				
Variables	Level	1 st Difference	Status	Remarks
HDI	-0.252738	-9.976592	I(1)	Stationary
LOG(COT)	-1.419280	-5.986497	I(1)	Stationary
LOG(FDO)	-0.991733	-4.693464	I(1)	Stationary
LOG(EXR)	-1.908968	-5.108212	I(1)	Stationary
Critical Values	Level	1 st Difference		
1%	-3.626784	-3.639407		
5%	-2.945842	-2.951125		
10%	-2.611531	-2.614300		

Source- Author's Computation Using e-view 9.0

Co-integration Test Result and Analysis

Since the series are integration of order one, that is, I(1) we then proceed to conduct the co-integration using the Engle-Granger two step procedure. The result of the Engle-Granger Co-integration test is presented in Table 3 below.

Table 3: Engle and Granger Co-integration Test Result

Variable	Level	5% Critical Values	Order of Integration	Remarks
RESID(ECM)	-4.782053	-2.945842	I(0)	Co-integrated
Stationary at both 1%, 5% and 10% Level of Significance				

Source- Author's Computation" Using e-view 9.0

From Table 3, the Engle and Granger (1987) two stage co-integration procedure of the model depicts that the residual from the regression result are stationary at 5 percent level of

significance. This means that all the explanatory variables (COT, FDO and EXR) are co-integrated with human welfare (HDI) in Nigeria within the period under consideration (1981-2017). In order words, there is a long run relationship between the dependent and independent variables.

Parsimonious ECM test result and Analysis

In order to confirm the existence of a co-integrating vector among the variables, the ECM was employed. This is based on the general-to-specific rule and the results are presented on table 4 below.

Table 4: Parsimonious ECM Result

Dependent Variable D(HDI)				
Method Least Squares				
Date 04/14/19 Time- 11:01				
Sample (adjusted) 1984 2017				
Included observations- 34 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.046456	0.024125	1.925625	0.0652
D(HDI(-1))	-0.461517	0.169183	-2.727918	0.0113
D(HDI(-2))	-0.444610	0.128631	-3.456483	0.0019
DLOG(COT)	0.055104	0.046068	1.196139	0.2424
DLOG(FDO(-1))	-0.168993	0.073838	-2.288703	0.0305
DLOG(EXR)	-0.142683	0.061828	-2.307721	0.0292
DLOG(EXR(-1))	0.114659	0.062608	1.831388	0.0785
ECM(-1)	-0.578484	0.180855	-3.198601	0.0036
R-squared	0.755876	Mean dependent var		0.015647
Adjusted R-squared	0.690150	S.D. dependent var		0.165772
S.E. of regression	0.092276	Akaike info criterion		-1.725745
Sum squared resid	0.221386	Schwarz criterion		-1.366601
Log likelihood	37.33766	Hannan-Quinn criter.		-1.603267
F-statistic	11.50045	Durbin-Watson stat		1.946747
Prob(F-statistic)	0.000001			

Source- Author's Computation Using e-view 9.0

Table 4 shows that the coefficient of crude oil trade (COT) has a positive relationship with human welfare (HDI). This implies that an increase in crude oil trade (COT) increases human welfare (HDI) in Nigeria within the period of study. The coefficients of crude oil trade (COT) conform to a priori in line with economic theory. The value of crude oil trade (COT) is not statistically significant at 5 percent level.

Furthermore, the results indicate that the coefficient of past lag 1 of foreign direct investment in oil (FDO) is negatively related with human welfare (HDI) and it impacts significantly on it, suggesting that an increase in foreign direct investment in oil (FDO) reduces human welfare (HDI) in Nigeria within the period of study. The coefficient of human welfare (HDI) does not conform to our a priori in line with economic theory and it impacts significantly on it in Nigeria. The negative effect of foreign direct investment in oil (FDO) on human welfare (HDI) within the period of study could be as a result of over dependent on the oil sector or may as a result of corruption.

Again, the coefficient of exchange rate (EXR) is negative and it impacts significantly on human welfare (HDI), suggesting that a devaluation of the naira against the dollar decreases human welfare (HDI) in Nigeria within the period of study. The coefficient of exchange rate (EXR) does not conform to our a priori in line with economic theory and impacts significantly on human welfare (HDI) in Nigeria.

The result also shows that the calculated Adjusted-R square is 0.690150, indicating that the regressors in the model account for about 69 percent of the total variation in human welfare (HDI). The remaining 31 percent are due to factors exogenous to the model but covered by the error term. Also, the overall regression result of the dynamic model is significant at 5 percent level as shown by the F-calculated of 11.50045. The ECM is positive that is, rightly signed (that is, negative) and is also significant. It shows about 58 percent disequilibrium in human welfare (HDI) in the previous year is corrected in the current year since the data used are annual. Also, the Durbin-Watson (D-W) statistics value is 1.9467, meaning that there is absence of serial autocorrelation in the model.

Diagnostic Testing Results

Table 5 below presents the results of the post estimation test. It shows the Normality test (using Jarque-Bera Statistics), Serial Correlation test (using Breusch-Godfrey Serial Correlation LM Test), Heteroscedasticity test (using Breusch-Pagan-Godfrey Test) and Stability test (using CUSUM & CUSUMSQ test). The study reveals that the model passes the entire post estimation test as presented in Table 5 below. Also, the model passes the stability test as shown in figures 1 and 2 below. This is so because the plots of the CUSUM and CUSUMSQ remained within the critical 5 percent limit.

Table 5: Diagnostic Test Results

Test	Result	Prob.
Normality Test	2.609924	0.2712
Breusch-Godfrey Serial Correlation LM Test	0.093199	0.9113
Heteroskedasticity Test	0.435173	0.8710
Linearity Test	0.395475	0.6958

Source- Author's Computation Using e-view 9.0

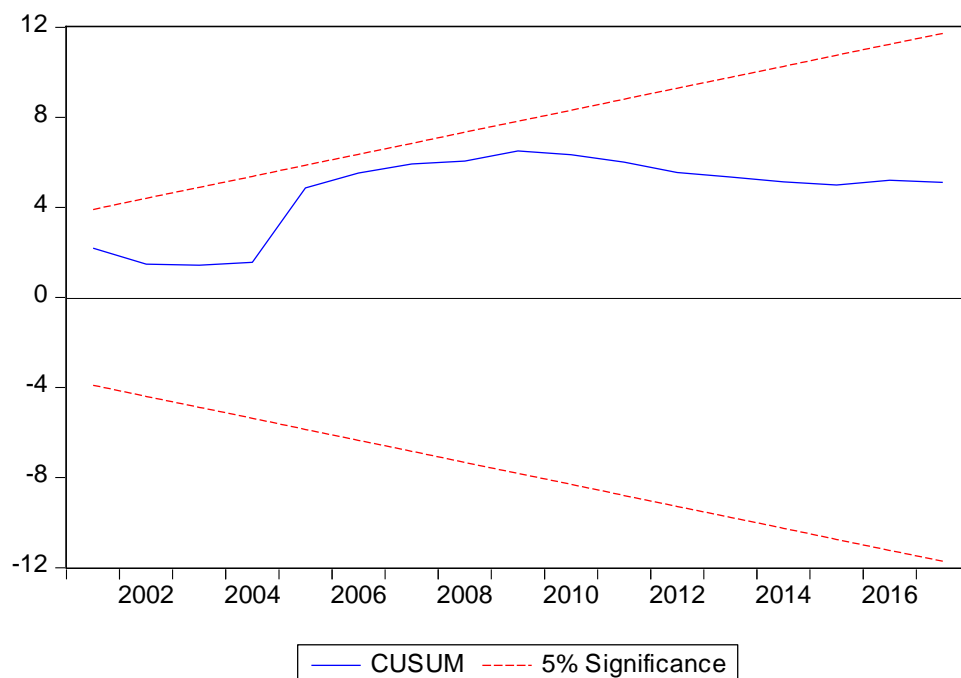


Figure 1- Stability Test Result based on CUSUM

CONCLUSION

This paper empirically examined the effect of crude oil trade on human welfare in Nigeria from 1981 to 2017. The study adopts descriptive statistics, Engle-Granger Co-integration and Error Correction Modeling techniques for the analysis. The data for the empirical analysis were sourced from secondary sources like CBN Statistical Bulletin. The results of analysis indicated that a long run relationship exists among the variables. Furthermore, the study revealed that crude oil trade (COT) has a positive and an insignificant impact on human welfare; foreign direct investment in to oil government expenditure in construction (FDO) has a negatively affected human welfare and exchange rate (EXR) devaluation negatively affected human welfare in Nigeria within the period under review. Based on the above findings, the paper recommends as follows:

- Government should make concerted efforts to revamp the real sectors through judicious use of oil revenue so as to create jobs and reduce poverty which will in turn promote human welfare in Nigeria; and
- Government should ensure transparency and accountability on the part of government officials in the administration of crude oil revenues so that it will promote human welfare development in Nigeria.

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