Forecasting Nigeria Agricultural Growth in the Era of Dwindling Oil Price

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Abstract

The persistent volatility in the price of crude oil has intensified the comparable challenges to generate jobs and foster inclusive growth in oil-exporting countries. The non-oil sector such as agriculture tends to be low and was subsequently the only source of growth and jobs. While a country like Nigeria has the forward and backward linkages of agriculture as the impetus for growth, the impact of dwindling oil prices on agricultural growth remains grossly understudied in extant literature. This study focuses on examining the impact of oil price on agricultural output growth in Nigeria over 1995-2019 through the quantile regression technique. This methodology provides a more robust estimate against outliers in response measurement of the nexus between indices of oil price and agricultural output growth. Our findings indicate that crude oil prices have a negative effect on the performance of the Nigerian agricultural sector and have been consistent with the results of the OLS assessment. The policy implication of this finding implies that agricultural production in Nigeria can be amplified by diversifying the economy; shifting emphasis away from the crude oil export only and focused more on the domestic production of agricultural output to compensate for the loss of revenue emanating from oil wealth. Also, the government as well as the private firms should team up to address the infrastructural deficit by investing in the agricultural sector to optimize the agricultural value chain for growth and development of the nation.

Key words: agricultural output growth, oil revenue, quantile regression, Nigeria
J.E.L. classification: C21, Q14

1. Introduction

The persistent volatility in the price of oil and perhaps the outbreak of COVID-19 has affected Nigeria's finances. The coronavirus epidemic has posed serious challenges to the global economy, causing stock-market and supply chain instability across the globe. Nonetheless, there has been a considerable amount of volatility in the oil industry since the beginning of oil price shocks 2014. While prices currently average at $30/barrel, the uncertainty about its continued survival is still overwhelming as Nigeria's governance problems are further heightened. The decrease in oil prices not only poses a strategic danger to the increasing significance of the country in the global economy but has become the latest impetus behind its domestic predicaments, such as rising unemployment, poverty, and continued insurgency inflow into the country. As the oil price shocks and COVID19 continued to harm the economy globally, various arms of government have begun to explore alternatives for diversifying the economy especially in light of the current economic situation largely caused by the decrease in crude oil revenue. In divergent to general views, Nigeria's economy is not oil-dependent because it is undiversified: oil only contributes about 10% of gross domestic product (GDP), an amount smaller than the contributions of both agriculture and manufacturing. Relatively, oil dictates the path of Nigeria's economy as it offers about 80% of total exports and, subsequently, utmost Nigeria's foreign exchange earnings. Given the foregoing, the government and several stakeholders in oil sectors are equally considering an investment in the non-oil sectors.

Globally, agricultural trade has been a driver for development, especially in developing countries where it is the leading source of wealth and generates employment (PWC, 2019). The persistent decrease in oil price would not only shrink the foreign reserves, perhaps it would make the foreign exchange rate more expensive, and firms will begin to struggle to source the for the factor inputs required for production. Thus, diversifying exports would reduce the country's sensitivity to oil prices and put the economy on a stronger footing. Nigeria's relatively diverse climatic conditions and vast areas of arable land make it possible to develop a wide range of crops as well as various livestock farming which tends to expand the government goal of food self-sufficiency (Ogbechie, 2017). An example of a prospect is the current intervention in rice and wheat production and processing, as the Nigerian government seeks to cut imports that cost the nation $4 billion annually. After all, with an estimated population of 200 million, an abundance of other natural resources including arable land, and a diverse workforce, Nigeria poses the tremendous potential for an untapped or under-tapped agricultural market. Over the years, agriculture contributes to this much-needed diversification. An estimate from Nigeria Statistical Bureau (2018) suggests that Nigeria's agricultural sector provides 23% of the country's GDP and employs approximately 70% of the labour force, which is relatively higher than the 9% contribution from the oil and gas sector. It is imperative to note that compared to the oil and gas sector or solid minerals, agriculture does not inherently require huge start-up investments. The agricultural sector contributed positively and regularly to the aggregate output in Nigeria (Ewetan & Okodua, 2013). Similarly, oil and gas companies are used to take high-risk activities while agriculture poses a lower or manageable risk profile. Consequently, it is evident that agriculture has not realized its full potential, particularly in the face of its growing population. The agricultural sector still can generate over $40 billion in exports (PWC, 2019). But despite this potential, Nigeria exported under $1 billion in agricultural products in 2019, which represents less than 1.4% of the country's total exports. Agriculture's poor performance in both productivity and competitiveness in Nigeria presents a significant structural challenge for the government and its people, who must cope with its ongoing demographic change and compete in an increasingly globalized and highly competitive marketplace for agricultural products.

In recent years, there has been a lengthy empirical investigation on the nexus concerning oil price shocks and various macroeconomic factors ranging from output growth, and to large extent, focus on the disaggregated sector variables. Remarkably, the majority of the studies focus mainly on price relations and volatility spillovers suggests that high oil prices increase the costs of producing agricultural outputs. A recent series of empirical research on the state of the relationship between prices of oil and prices of agricultural commodities using various methodologies indicates that a different indirect relation is formed between prices (Esmaeili & Shokoohi 2011). While using a general equilibrium model with clearly defined macro-economic relations, Gohin and Chantret (2010) reported negative effects of oil prices on agricultural prices. In divergent to the erstwhile empirical investigation that concentrated on the direction of dwindling oil prices and agricultural output prices, the scanty empirical investigation has been recorded concerning the direction of oil prices and agricultural growth. Few of these studies (see Akpan, 2009; Binuomote & Odeniyi, 2013; Ikram & Waqas, 2014, amongst others) affirmed that the crude oil prices exert a negative and significant impact on agricultural output. Thus, given the foregoing, the nexus concerning oil price fluctuations and agricultural output growth seems to be diverse. Beginning with methodology standpoint, numerous explanations may be expounded for differences ranging from sample adopted, call for alternative sources of energy, and the estimation techniques. Further, the paper contends that these empirical conclusions may be biased presumptuous that the distributional heterogeneity of agricultural output growth returns is disregarded. Economic theory suggests that oil price shifts directly impact agricultural prices through cost-push effects by increasing the cost of production and transportation costs (Nazlioglu & Soytas, 2012). The other impact is expressed by agriculture commodity prices in the form of consumer prices. The increase or decrease in oil price is transferred by the firms that used agricultural output as input in production to consumers.

To the best of our knowledge, no empirical literature ought to have established the nexus between oil price fluctuations and agricultural output growth behaviour exploring the quantile regression model framework in Nigeria and possibly in Africa. **T**he paper contributes knowledge in three ways. In divergent to all studies that predominantly focused on oil price-output growth, the

study examines whether the persistent changes in oil prices would impact the agricultural output growth noting the underlying problem of how the effects of fluctuations in oil prices vary across economic sectors and how they may have changed is of particular importance. Secondly, in divergent to the existing studies, this paper adds to the literature by examining the effects of oil price fluctuations on agricultural output growth for a net oil-exporting country, Nigeria. The paper explores a quantile regression (QR) model to examine the effects of oil price changes on both the mean and the conditional distribution of agricultural output growth returns. By and large, the paper aims at investigating how agricultural output growth response to the price of oil shifts. The reason for employing quantile regression on the equation of oil price changes relies on the fact that QR possesses the capability to explain whole conditional dispersal of agricultural output growth returns. Therefore, the paper conceivably will gauge how oil price changes influence agricultural output growth allowing to their location on the conditional dispersal of agricultural output growth returns. While the threat to agriculture currently exists in Nigeria, the government has pledged to revive the economy through agriculture, amidst dwindling oil revenues and subsequently spillover effects. There are plenty of opportunities to be created in Nigeria if governments focus on maintaining agricultural growth and captivating the deviations in inventories. Indeed, oil-exporting countries such as Nigeria have the forward and backward linkages of agriculture as the stimulus for development, and the effect of dwindling oil prices on agricultural growth remains poorly understood in the current literature. Hence, this study focuses on examining the impact of oil prices on agricultural growth in Nigeria. Section two reviews the literature on oil price-agricultural sector analysis. Section three resolves around the methodology. Section four focuses on empirical analysis while section five concludes, summarizes, and offers policy recommendations.

2. Literature review

Literature is abounding concerning the nexus between agriculture and output growth. It appears largely in the literature that there are three empirical standpoints. The first category focused predominantly on the role of the agriculture sector to the output growth (Aminu & Anono, 2012; Tolutope & Chununso, 2013; Bakare, 2013; Abogan, Akinola, & Baruwa, 2014; amongst others. These studies suggested a linkage concerning the agriculture input al sector and economic growth. For instance, Oje-Okoro (2011) resolved through multiple regression analyses that there is a positive relationship between economic growth and the agricultural sector. The author also emphasized that domestic savings, as well as expenditure incurred by the government on agriculture, contributed eighty-one percent (81%) to the economic growth (GDP) result. Also, the findings of the empirical examination by Bakare (2013) revealed that past agricultural production values may be explored to predict the impending actions of Nigeria's rural growth**.** The investigation was followed by an analysis of the effects of non-oil exports on Nigeria's economic development from 1980 to 2010, by Abogan, Akinola, & Baruwa (2014). The authors used the co-integration methodology and reported that non-oil exports had a moderate economic growth effect as unit growth in non-oil exports increased their productive potential by 26%. Syed, Muhamma, and Rana (2015) focused on another recently published study on the macroeconomic effects of Pakistan's agricultural exports from 1972 to 2008. The authors found that agricultural exports had a negative relationship with economic growth, while non-agricultural exports had a positive relationship with economic growth.

However, it is evident that empirical investigation has shifted focus to the nexus between the global oil market and relevant industries, and contended that volatilities in oil price noticeably have diverse impacts on diverse industries. Manufacturing firms responded to volatilities in oil prices owing to the transmission through which oil price shocks impacted the industry. Besides, some studies contended that there exists nexus between the oil price and agricultural output prices (see Farzanegan & Markwardt, 2009; Fowowe, 2016). Oil price shocks have divergent impacts on agricultural output prices at diverse times. Oil price shocks contributed to insignificant changes in agricultural commodity prices before the food crisis from 2006 to 2008. Oil price fluctuations impact agricultural commodity prices by increasing the costs of production and transportation costs. Nevertheless, there exist divergent views on the nexus between which oil price shocks and agricultural commodity prices.

For example, Zhang and Qu (2015) explored the impact of oil price volatility on Chinese agricultural products. The findings have been described by the cluttering and jumping behavior of oil prices. Results showed that oil price shocks had a significant impact on agricultural commodities in various ways, and asymmetrical. Consequently, Ikram and Waqas (2014) investigated the impacts of oil price instabilities on agriculture output development in Pakistan. The authors relied on the time series data from 1980 to 2003 and explored co-integration and error-correction techniques to examine the nexus. The findings of the study revealed that oil prices and excess intake of fertilizer hurt agricultural output growth in Pakistan. Also, the effects of oil prices on agricultural production in Nigeria from 1981 to 2010 were analyzed by Binuomote and Odeniyi (2013) using the same methods. The findings revealed that oil prices negatively linked to agricultural productivity in Nigeria. The results further stated that a 10 percent increase in oil prices will result in a 0.4 and 0.34 percent decrease in agricultural productivity in the short- and long-run respectively. The authors affirmed that crude oil prices exert a negative and significant impact on agricultural output in Nigeria.

Thus, despite the vast literature on the subject to date, the theoretical models on the channel of transmission of oil price-macroeconomy have been assessed using different methodologies. Authors have applied the vector autoregressive (VAR) technique, Granger causality, Bayesian analysis, Toda–Yamamoto causality model, impulse response function analysis, cross-correlation analysis, the vector error correction model, etc. (Farzanegan & Markwardt, 2009; Gohin & Chantret, 2010; Nazlioglu & Soytas, 2011; Nazlioglu & Soytas, 2012; Liu, 2014; amongst others). Also, both single country and panel studies exist with each study considering the macroeconomic effects of oil price variations using different macroeconomic factors, largely due to the availability of data on selected variables. Meanwhile, there is also a reasonable volume of literature on modeling oil price volatility. Some of the recent studies on the subject cover some areas and issues, and some studies showed that the time series of crude oil prices were described by volatility clustering and asymmetry (Morana, 2001; Chan & Maheu, 2002; Hamilton, 2003; Cunado & Perez De Gracia, 2014; Zhang & Chen, 2015; amongst others). However, given the lengthy body of literature that focuses on nexus between oil prices and economic output, only a few efforts have been made with regards to specific commodities like agriculture, manufacturing, etc. Similarly, to the best of our knowledge, no study in this regard has explored a quantile regression (QR) model to examine the effects of oil price changes on both the mean and the conditional distribution of agricultural growth returns.

3. Research methodology

This paper explored the quantile regression model piloted by Koenker and Bassett (1978) to forecast the impact of indices of oil price on agricultural growth in Nigeria between 1995 through 2019. Quantile regression is an approach focused on estimating conditional quantile functions. This technique overcomes the problems with variance heterogeneity in ordinary linear regressions on the various conditional quantile of the outcome variable scope (Koenker & Bassett, 1978). Given that changes in oil price impact agricultural output in the form:

$$q_r(AGW_t|\Delta OP_t) = \alpha(\tau) + \beta(\tau)\Delta OP_t + \varepsilon_t(\tau) \quad (1)$$

Where AGW_t and ΔRV_t are defined as agricultural growth and oil price, respectively, at time t, and $\varepsilon_t$is the residual. The resulting equation (1) shows that the quantile regression methodology helps us to assess the link between agricultural output and the price of oil, rather than to capture the average relationship, as in the OLS regression at different levels of distribution of agricultural growth. However, erstwhile studies on oil price-economic output nexus predominantly examine two diverse characteristics namely oil price shocks and oil price volatility. These two methodologies diverge in the modus in which they integrate oil prices into their models. Some of the existing studies explored exchange rates in transforming oil prices into domestic oil prices, hence; the paper followed Huiming, Hui, Cheng and Yan (2016) to gauge crude oil price changes as follows:

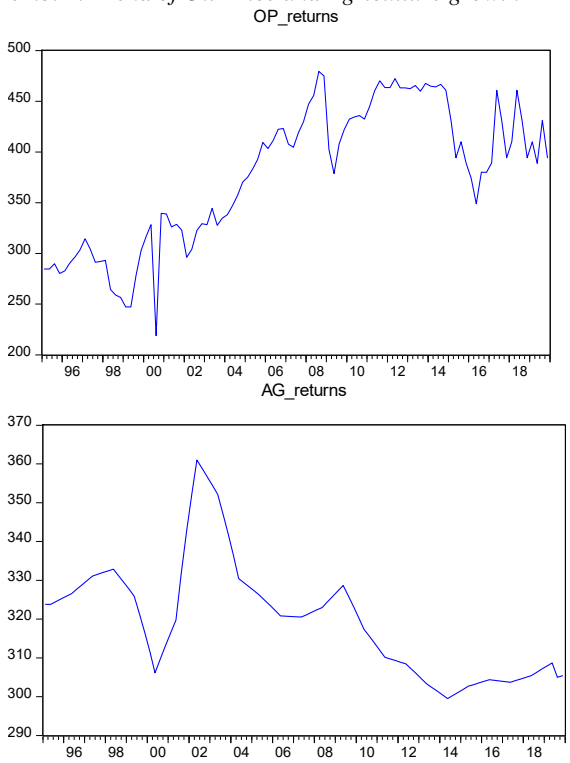
$$OPr = 100 * (lnP_t - lnP_{t-1}) \quad (2)$$

where P_t signifies the oil price at time t . The agricultural growths are well-defined in a related way. Thus, equation (2) is then incorporated into equation (1) to become

$$q_r(AGW_t|\Delta OPr_t) = \alpha(\tau) + \beta(\tau)\Delta OPr_t + \varepsilon_t(\tau) \quad (3)$$

Nigeria's oil prices are sourced from OPEC Statistical Bulletins. Agricultural growth index is sourced from World Bank Development Indicator. Graphical depictions of the selected data are presented in Figure 1. These figures provide that crude oil prices have been highly volatile over the years. Perhaps, the contributing factor that leads to persistent volatility in oil prices is linked to comparative fluctuations in oil supply relative to demand. Besides, the change from crude oil to greener and more efficient sources also contribute to the volatilities in the oil prices. Figure 1 also demonstrates the government neglect of the agriculture sector.

Figure no. 1: Trend of Oil Price and Agriculture growth



Source: Author's computation

The econometric analysis involves two basic steps. These include pre-estimation which focuses on the examination of the structural breaks in the nexus between agricultural growth and oil price volatility. The second phase deals with estimation and post- estimation. The regression model is measured as:

$$AGW_t = \alpha + \rho_t\beta(\tau)\Delta OPr_t + \varepsilon_t(\tau) \quad (4)$$

where AGW_t and ΔOPr_t depict agricultural growth and oil price returns, respectively, at time t; ρ_t is a dummy variable, and τ represents the likely break date. Nevertheless, for each possible break date, structural breaks are confirmed one after the other using the sequential technique suggested by Bai and Perron (1998). The procedure requires an assessment of a full sample of structural breaks. Upon identification of the structural break, the sample is divided at the expected break date; structural break tests are then estimated separately for each sub-sample. Then, equation (4) is incorporated into equation (3) to become a quantile regression model with structural breaks:

$$q_r(AGW_t|\Delta OPr_t) = \alpha(\tau) + \beta_1(\tau)d_1\Delta OPr_t + \beta_2(\tau)d_2\Delta OPr_t + \beta_3(\tau)d_3\Delta OPr_t + \varepsilon_t(\tau) \quad (5)$$

4. Empirical results and discussion

This paper focuses on the examination of the effect of distributional variations in oil prices on agricultural growth in Nigeria. Descriptive statistics are presented in Table 1. Table 1 shows the average value of 319.6 and 377.8 for agricultural growth and oil price returns respectively for the period of review. The paper relied much on the statistics from Skewness, Kurtosis, and the unit root tests. The results demonstrate that the oil price returns are negatively skewed while agricultural growth returns are positively skewed. All indicators have mild kurtosis, indicating that all distributions are non-normal and asymmetric, consistent with the characteristics of frequent shifts in the markets for oil and agricultural outputs. This observation satisfactorily ascertains the need for examining the impacts of dwindling oil prices on agricultural output growth returns at diverse quantiles. Thus, we employ the quantile regression methodology to examine the dependence between the oil price and Nigeria's agricultural growth in equation (5), a method which can explain the magnitude of reliance more flexibly. Besides, Table 1 further presents the summary of the results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) Unit roots test. The results reveal that all variables explored in the paper were stationary at a 1% level of significance respectively.

Table no. 1: Descriptive Statistics and Stationary Tests

	AG_RETURNS	**OP_RETURNS**
Mean	319.6605	377.8694
Median	320.7120	391.0372
Maximum	360.9974	479.5543
Minimum	299.5245	218.8296
Std. Dev.	14.53049	68.55724
Skewness	0.767646	-0.301675
Kurtosis	3.287634	1.915034
ADF	-3.115 (0.002)*	-12.18 (0.000)*
PP	-3.826 (0.004)*	-13.75 (0.001)*

Note: * significant at 1%
Source: Author's Computation using E-Views 10

Using the OLS technique and the quantile regression model with structural breaks, the empirical results of changes in oil prices are presented in this sub-section for the impact on agricultural growth throughout each quantile of the distribution of agricultural growth. The Multiple structural breaks technique piloted by Bai and Perron (2003) were used. The result reveals remarkable heterogeneity in the selected variable. The result demonstrates that the structural break occurred at the following dates: 2010Q4; 2005Q4 and 2001Q3. The three breaks established in Nigeria may be related to the U.S. housing economic collapse that prompted the worldwide financial meltdown of 2007, resulted in banking consolidation, and to a persistent fluctuation in crude oil prices in 2003. Table 2 offers the results of the ordinary least square (OLS) and quantile regression estimation. The OLS estimation results for the nexus between changes in oil prices and agricultural growth in Nigeria reveals that the coefficient of oil prices is significant and negative at the 5 percent level of significance. This indicates an inverse nexus between oil prices and agricultural growth in Nigeria, suggesting that a percent change in oil prices will decrease agricultural growth by 12.5%. The results of the diagnostic tests show that the adjusted R-squared is 0.750, suggesting that about 75 percent of the total variation in Nigeria's agricultural growth is explained by changes in oil prices between 1995 and 2019. The F-statistic clarifies the instantaneous significance of all parameters and the result demonstrates that oil prices have simultaneous significant impacts on agricultural growth level in Nigeria between 1995 and 2019 at a 1% critical level.

Table no. 2: Estimation results for the quantile regression and OLS regression

Parameter/ Quantile	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	OLS
α	320.3*	353.2*	353.8*	359.5*	362.5*	363.3*	363.5*	364.7*	370.2*	359.7*
OPr_t	-0.04	-0.12*	-0.12*	-0.13*	-0.13*	-0.13*	-0.13*	-0.12*	-0.13*	-0.13*
d_1	0.04**	0.05**	0.04**	0.06**	0.02	0.02	0.03***	0.03**	0.04**	0.04*
d_2	0.018	0.01	0.01	0.003	0.05***	0.06**	0.065*	0.06*	0.06	0.03**
d_3	-0.01	-0.01	-0.01	-0.02	0.02	0.02	0.01	0.00	-0.00	-0.01

Note: *, **, *** denote statistical significance at the 1%, 5%, 10% levels, respectively.
Source: Author's Computation using E-Views 10

Table 2 painstakingly explains the impacts of distributional changes in oil prices on agricultural growth returns. The quantile regression results show that oil price coefficients are negative and significant across all quantiles, a finding consistent with the results through OLS estimation. It was noticed that the values of the parameter estimates at the 0.4 quantiles are close to those of the OLS. This outcome of this paper is no doubt of the economic framework in Nigeria. Remarkably, our finding is in tandem with studies such as Binuomote & Odeniyi (2013), Ikram & Waqas (2014), affirmed that the crude oil prices exert a negative and significant impact on agricultural output. The coefficients in sub-period 1 (d_1) are low and significant in almost all quantiles but are insignificant in the 50th and 60th quantiles. The estimates for sub-period 2 (d_2) remain low and insignificant from the 10th to 40th quantiles. The results reveal further that sub-period 2 yields a significant and low impact which is not that different from findings in sub-period 1. Relatively, the findings suggest that all estimate coefficients are low and insignificant across all quantiles. However, it is interesting to note that the estimate is also small and significant for all parameters, except for sub-periods 2 and 3.

Table no. 3: Estimation results for the Quantile Slope Equality and Symmetric Quantiles Tests

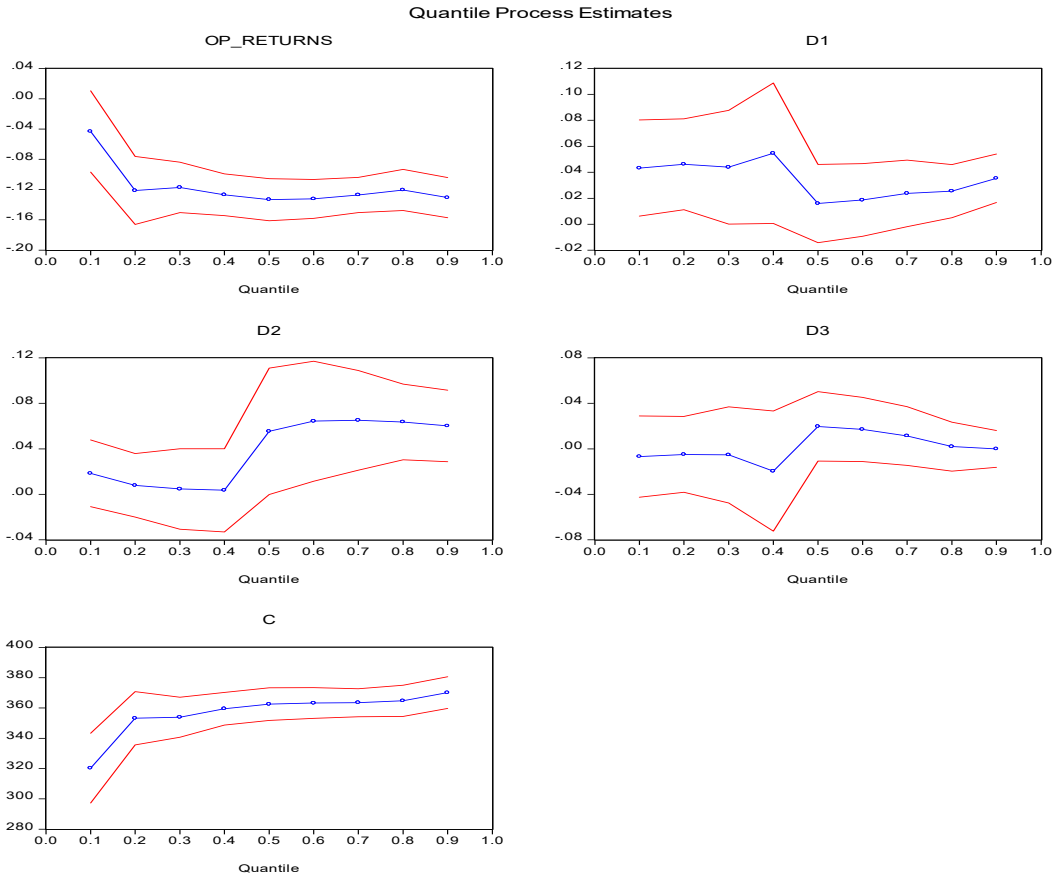
	Quantile Slope Equality		Symmetric Quantiles	
	Chi-Sq. Statistic	Prob.	Chi-Sq. Statistic	Prob.
Wald Test	65.29832	0.0005	24.18816	0.2343

Quantiles	Variable	Restr. Value	Prob.
0.1, 0.9	OP_RETURNS	0.092601	0.0053
	D1	0.046832	0.1190
	D2	-0.032080	0.5432
	D3	-0.046361	0.1214
	C	-34.54302	0.0103
0.2, 0.8	OP_RETURNS	0.024727	0.3326
	D1	0.039792	0.1160
	D2	-0.039274	0.4130
	D3	-0.042392	0.0951
	C	-7.062633	0.4757
0.3, 0.7	OP_RETURNS	0.022263	0.2332
	D1	0.035763	0.1089

	D2	-0.040901	0.3237
	D3	-0.033394	0.1344
	C	-7.646271	0.2926
0.4, 0.6	OP_RETURNS	0.007235	0.5710
	D1	0.041492	0.0596
	D2	-0.042797	0.1885
	D3	-0.041961	0.0556
	C	-2.193115	0.6577

Source: Author's Computation using E-Views 10

Table 3presented the results of the slope and symmetric quantiles. The Wald test result of the slope equality test is 65.29832 which is statistically significant at a 1% level of significance, suggesting that slope equality is a difference across quantile levels. Hence, the inter-quantile range could not reject the null hypothesis of equality at 5%, indicating that slope equality does not differ. Also, Baur (2013) indicates that quantile regression can have asymmetric and time-varying dependencies. Given this assertion, the Wald statistics of the symmetric quantiles test are 24.18 which are not statistically significant at a p-value of 0.234. This suggests evidence of symmetry. However, the result of the oil price returns coefficient restriction test values reveal evidence of asymmetry at the quantile level 0.1 and 009s. This finding means that, in different economic situations, governments and businesses will take different measures to deal with different changes in oil prices. Figure 1 shows the estimated quantile conditions of agricultural returns for growth and fluctuations in oil prices with structural breaks in the quantile regression model. Significantly, in each case, part of the quantile regression estimates decline below the normal regression confidence interval.



5. Conclusions and policy implication

Despite the boom in the oil sector in recent years, the robust fluctuations in oil prices have continued to exacerbate comparable challenges in creating jobs and fostering inclusive growth in oil-exporting countries. While countries like Nigeria have the forward-l and backward linkages of agriculture as a driving force for growth, the impact of oil prices on agricultural growth remains grossly understudied in the existing literature.

This study was designed to examine the impact of the price of oil on agricultural growth in Nigeria between 1995 and 2019. This paper leans on quantile regression methodology to explore the effect of oil price changes on Nigeria's agricultural growth.

Our quantile regression results show that oil price coefficients are negative and significant across all quantiles, a finding consistent with the results through OLS estimation. Remarkably, our finding is in tandem with studies such as Binuomote & Odeniyi (2013), Ikram & Waqas (2014), affirmed that the crude oil prices exert a negative and significant impact on agricultural output. The coefficients in sub-period 1 (d_1) are low and significant in almost all quantiles but are insignificant in the 50th and 60th quantiles. The estimates for sub-period 2 (d_2) remain low and insignificant from the 10th to 40th quantiles.

The results reveal further that sub-period 2 yields a significant and low impact which is not that different from findings in sub-period 1. The presence of low impacts in varying periods is linked to the adoption of different monetary strategies to enhance agricultural output and to the reinforcement of exports from a variety of activities that have an impact on economic systems, resulting in their complexity changing over different periods.

The paper concludes that oil price has a negative and significant impact on agricultural growth in Nigeria.

The policy implication of this finding implies that agricultural production in Nigeria can be amplified by diversifying the economy and change the emphasis away from the crude oil export only and focused more on the domestic production of agricultural output to compensate for the loss of revenue emanating from oil wealth. Also, the government as well as the private firms should team up to address the infrastructural deficit by investing in the agricultural sector to optimize the agricultural value chain for growth and development of the nation.

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