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Empirical Analysis of the Nexus between Crude Oil Price Volatility and Selected Economic Sectors in Nigeria

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Abstract: *Fluctuations in the global price of crude oil has become a major concern for many economies who depend majorly on oil export for foreign exchange earnings. This study therefore investigates the impact of crude oil price volatility on some selected economic sectors (transport, agricultural and manufacturing sectors) in Nigeria from 1981q1 to 2015q4. Adopting the exponential generalized autoregressive heteroskedasticity (EGARCH) model, the empirical result shows that a certain period of low volatility is followed by another period of low volatility. Meanwhile, a period of high volatility is followed by another period of high volatility. Crude oil price has a negative impact and is statistically significant to transportation sector, manufacturing output, and agricultural sector respectively. Based on the findings, the study recommends that the government should reform the economy and diversify her export revenue base as a means of minimizing reliance on crude oil and petroleum product. Some of these reforms include fiscal prudence, reform in budgetary operations, export diversification, revival of non-oil sectors, which will further shield the economy from the impact of oil price fluctuations. The study further recommends that policy makers of net oil exporting countries like Nigeria should give support to the restructuring of their economies in such a way that their non-export will boost their domestic economy.*

Keywords: Agriculture; ARCH and GARCH; crude oil price; transportation; manufacturing output
JEL Classification: E31; E32; L90; O14; Q10; Q31

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1. Introduction

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Crude oil plays a vital role in every economy, as it remains a primary source of energy for transportation, agriculture and manufacturing industries. This makes a rise in the price of oil a significant influence on economic conditions. Crude oil price changes result from the interaction of the forces of demand and supply of oil in the global commodity markets (Arezki et al., 2017). Hamilton (2009) documented an inverse relationship between oil price changes and the growth rates of real GDP.

Volatility can also be articulated as a percentage and computed as the yearly standard deviation of the percentage change on a daily basis (Orji, A, Ogbuabor, J.E and Anthony-Orji, O.I. 2016 and Obodoechi, Orji & Anthony-Orji, 2018). By inference, the higher the degree and the number of changes in price over time, the higher the occurrence of volatility. According to Chen and Hsu (2012), fluctuation in the price of crude oil may produce future uncertainty about the path of the price of oil, causing a consumer to defer permanent purchases of long-lasting goods and delay investments. As an outcome, the increase in the price of oil has a tendency to lessen the profits of non-exporting firms, leading to a decline in their fundamental values.

In the 19th and early 20th century, seven oil giants formed a cartel in 1920 known as the rise of the seven sisters to exert power over the price of oil. Following this, the Organisation of Petroleum Exporting Countries (OPEC) was formed comprising several national oil companies. Between the 1920s and 1960s, international oil companies kept the price of crude oil stable, notably below \$40 per barrel until the 1970s when OPEC started its plan to control crude oil price. The year 1973 marked the first attempt the cartel sought to exercise its control over crude oil prices. The crude oil price rose from the first time in Nigeria from \$3 to \$11.6 per barrel in response to the uncertainties created by the Grab-Israel war, which erupted in October 1973. The resultant rise in the price of crude petroleum generated a total of about N9.2 billion in revenue for Nigeria in 1994 as the country exported 108 million tonnes of crude oil in the same year.

According to Erygit (2009), the urbanisation and transformation of the international economy have led to an increase in the demand for oil because oil is the livelihood of the economy. As a result of the daily use of oil, there was an increase in its demand. To this effect, the crude oil market has and continues to experience ongoing changes because it is crucial to the world and its market (Ogundipe, Ojeagaa and Ogundipea, 2014). According to Guo and Kliesen (2005), oil price shocks raise doubt about future prices of oil and thus delay business outlay. In Elder and Serletis (2010), indecision about oil price is argued to induce optimising firms to postpone irreversible investment decisions as long as the expected value of information surpasses the expected short-run return to current investment. Therefore, both positive and negative shocks in the price of oil increase uncertainty in the economy, thereby causing investment to stagnate.