

Review

Oil Price Volatility and Economic Growth

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This study was carried out to examine the relationship between oil price volatility and Nigerian economic growth. The study covered the period 1970 to 2013 based on both empirical and conceptual literature review of the works of other researchers. This study attempts to answer the question of if the volatility of global oil prices is directly linked with the rate of economic growth in Nigeria and uses macroeconomic variables as determinants of economic growth. Secondary data were sourced from the works of other researchers in addition to those obtained from relevant government agencies, financial institutions and international organizations like the World Bank, United Nations and African development bank among others. The study reveals that in the short-run, Nigeria was able to have increasing economic 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 had a negative effect on Nigeria's economic growth. Thus, the study found that global oil prices volatility are the cause of Nigeria's unstable rate of economic growth. This is because oil price changes have considerable effect on government revenue and expenditure and thus the level of employment, rate of inflation, level of consumption and exchange rate movement. The study also found that Nigeria being a monoprodukt economy has a special case of the Dutch Disease, where a country seemingly good fortune proves ultimately detrimental to her economy. This study thus recommended that the Nigerian government should endeavor to have increase production in non-oil sector, diversifies and industrialize hereconomy, have fiscal prudence, reform in budgetary operations, export diversification, accountability and good corporate governance while at the same time avoid waste through privatization and commercialization of government owned corporations. It is our belief that when these measures are put in place, Nigeria will be able to have sustainable economic growth that is not susceptible to the vagaries of oil price volatility.

Key words: Oil price, volatility, inflation, economic growth, and fiscal policy

INTRODUCTION

Oil is a commodity with special characteristics. These include its unique role as the common natural heritage of a country and the motor of global industrialization, its depletability, its price volatility and consequent boom-bust cycles, its especially high capital intensity and technological sophistication, its enclave nature, and the exceptional generation of profits that accrue to the state and to private actors (Karl, 2004).

Most oil price movements, especially up to the mid-1980s' and earlier, consisted in price increases. However, the pattern has changed. There are large price increases

and decreases reflecting a substantial rise in the volatility of the real oil price which creates market uncertainties that induce companies to postpone their investments (Ogiri, Amadi, Uddin and Dulong, 2013).

In recent years, several factors have led to the current state of the oil market, which is characterized by volatile prices for crude oil and petroleum products. These factors include: Rise in demand in emerging economies, global financial crises, strikes, wars and decreased oil production, Decline in global investment in the industry; Lack of expansion in refinery capacity; Supply bottlenecks and uncertainties associated with domestic problems (for example, in Nigeria), and international politics (Iran, Iraq, Venezuela, and Russia) that impact supply; Supply uncertainties associated with extreme

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weather events (such as hurricanes); Lack of a dominant actor in the market to manage excess supply and demand; and Commoditization of world oil (African Development Bank and African Union, 2009).

It is because of this volatility in oil prices and Nigeria's dependence on oil revenue as the means of achieving her quest for rapid economic growth that many economists raise concern about the future of the economy. The mono product growth strategies being followed by Nigeria and many developing countries with abundance of natural resources appear not to be working, while developed countries follow industrialization and diversification strategies which have led to economic growth.

The objective of this study is to find out if the volatility of global oil prices is directly linked with the rate of economic growth in Nigeria and the influence it has on the macroeconomic variables affecting economic growth.

CONCEPTUAL LITERATURE

Oil price volatility

In relation to crude oil price, volatility is the measure of the tendency of oil price to rise or fall sharply within a period of time, such as a day, a month or a year (Ogiri, Amadi, Uddin and Dulon, 2013). Price volatility" refers to the degree to which prices rise or fall over a period of time. In an efficient market, prices reflect known existing and anticipated future circumstances of supply and demand and factors that could affect them. Changes in market prices tend to reflect changes in what markets collectively known or anticipate. When market prices tend to change a lot over relatively a short time, the market is said to have high volatility. When relatively stable prices prevail, the market is said to have low volatility. In energy markets, assets represent huge investments, typically hundreds of millions if not billions of dollars. The ability of those investments to earn a return depends upon the ability to produce fuels or power and sell it at a viable price (Metric of the month, May 2012)

The price of oil has attracted a considerable degree of attention for many decades. Various attempts have been undertaken to explain the changes of oil price as well as to assess the macroeconomic consequences of oil price movements. Apero and Ijeoma (2013) stated that the price of oil oscillates between \$17 and \$26 at different times in 2002 hovered around \$53 per barrel by October 2004 and moved further to \$55 in 2005. By July 2008, the price of oil rocketed to a record \$147 per barrel and thereafter, a sharp drop to US \$46 a barrel. In fact, the price of oil has witnessed profound fluctuations since 1974. Persistent oil price volatility could have severe macroeconomic implications, thus inducing challenges for policy making - fiscal or monetary in both the oil exporting and oil importing countries. A number of factors have been identified as triggers of oil price volatility. These factors range from demand and supply of crude oil,

OPEC decisions, transportation problems, differences in information asymmetry, crises, and wars to economic downturn.

Oil price volatility and Nigeria economic growth

It is estimated that Nigeria has 37.2 billion barrels of oil reserves (as of 2011) and produces an average of 2.13 million barrels per day (EIA, 2013). The hydrocarbon sector also accounts for more than 75 per cent of the federal government's revenue. This suggests that Nigeria is heavily dependent on the oil sector for the majority of government spending, infrastructure and most economic development activities (EIA, 2013).

Estimating the consequences of oil price volatility on growth is particularly relevant in the case of Nigeria. As a small open economy, it has no real influence on the world price of oil, whereas, it is greatly influenced by the effect of oil price volatility both as an exporter of crude oil and importer of refined petroleum products. It thus implies by simple reasoning that oil price volatility whatever the nature (either a rise or fall) can both benefit and hurt the economy at the same time. Changes in the price of crude oil usually force government to adjust its expenditures in line with such changes. This creates a dilemma especially for capital expenditures because they are entirely financed by oil revenues. For example, from 1972 to 1975, government spending rose from 8.4 percent to 22.6 percent of GDP. By 1978, it dropped back to 14.2 percent of the economy (World Bank, 2002). The nation's development plans and public projects since 1960, as a result have been defected. It can be recalled that Nigeria increased her spending when oil prices and public revenues increased in the 1970s and early 1980s as export revenues were spent on the domestic economy.

With Nigeria's rapid growth currently becoming stagnant at around 7 percent and oil prices which continue to be volatile, there is much discussion on the topic of what can be done to ensure continuous economic growth regardless of the global market. This volatility of oil price is traceable to global financial crises, strikes, wars and decreased oil production. It is because of this volatility in oil prices and Nigeria's dependence on oil as a monoprodut that many economists raise concern about the future of the economy. The resource based growth strategy followed by Nigeria and many developing countries with an abundance of natural resources appear not to be working. Most Latin American and African countries still struggle to develop, while developed countries follow industrialization and diversification strategies which have led to economic growth.

Oil price volatility and macroeconomic growth variables

The variables affecting economic growth include: fiscal

policy, balance of payments, inflation and distributional effect.

Fiscal policy and oil price volatility

Fiscal policy is linked to asymmetry in the effects of oil price volatility. In a study of six major net oil-exporting developing countries, Moshiri and Banihashem (2011) finds that a reduction in oil prices leads to economic stagnation in four countries, but that an increase does not lead to sustained economic growth in any country. In addition, the impacts of positive and negative oil price volatility follow different paths of transmission. These results are explained not only by the procyclical character of fiscal policy but also by factors such as spending beyond the economy's absorption capacity, the impossibility of reverting some of the public expenditures made during the period of price increases and poor management and rent-seeking behaviour in the allocation of increased revenues. Government projects are therefore not sustainable in the long term and may be left unfinished when oil prices stabilise, failing to contribute to economic growth (Moshiri and Banihashem, 2011).

Inflation and oil price volatility

The increase in oil prices up to 2008 led to inflationary pressures in many developing economies. These pressures were especially severe in net oil-exporting countries. In the period 2003–7, the inflation rate in these countries was always higher and more volatile than in other countries, whereas in 2007–8, the growth in inflation was also considerably higher (Habermeier *et al.*, 2009). However, this is not explained by a higher share of fuel in aggregate consumption in oil-exporting countries, but by the propensity of these countries to apply expansionary fiscal policies. The sensitivity of each country to inflation pressures derived from the oil shock also depends on the exchange rate regime. Inflation pressures were particularly marked in countries with soft exchange pegs, where monetary policy was subject to the aim of maintaining the exchange rate target (Habermeier *et al.*, 2009).

Balance of payments and oil price volatility

Oil price volatility affect the terms of trade, by changing the ratio between the value of imports and exports, with repercussions on countries' balance of payments. The rise in oil prices in 2007–8 indeed weakened the balance of payments of net oil-importing developing countries. One study (IMF, 2008) shows that the balance of payments impact of oil price increases in this period was four times as large as that of food prices, which reflects the higher share of fuel in total imports.

Deterioration in the balance of payments has effects on

economic growth, although some countries are successful at absorbing shocks (Funke *et al.*, 2008). These effects tend to be more acute in small countries dependent on oil imports and with a limited export base and low reserves, as the trade deficits linked to oil price increases have to be financed by foreign exchange reserves, which limits the scope for investment in machinery and equipment, thus affecting economic growth (Jayaraman and Lau, 2011).

Distributional effects and oil price volatility

Due to the effect oil price volatility has on employment, food and transport prices, it also has important distributional impacts within a country. Estimates from several institutions show that the global Triple F (financial, food and fuel) crisis in 2008–9 is responsible for an increase of between 75 and 130 million in the world population under the extreme poverty line (FAO, 2008; World Bank, 2008; WFP, 2008). Evidence shows that the recent oil price volatility have increased food insecurity (Headey, 2009) and poverty levels in developing countries (Poveda and Martínez, 2011; Twimukye and Matovu, 2009). However, some segments of the population have a higher degree of vulnerability to these shocks, including the poor, the landless, informal sector workers and female-headed households. Evidence from household surveys in several countries shows that oil price shocks tend to have a stronger effect on poorer households, as a higher proportion of their expenditure goes on oil products (Tevelde, 2007).

THEORETICAL LITERATURE

Dominant theories of economic growth have suggested that significant relationship exist between national income and economic growth. That is, when income is invested in an economy, it results in the growth of that economy. Harrod (1939) and Domar (1946) models as cited in Igberaese (2013), growth is directly related to savings (unspent income). For example, Sachs and Warner (1997) using a sample of 95 developing countries that included Indonesia, Venezuela, Malaysia, Ivory Coast and Nigeria, found that countries that have a high ratio of natural resource exports to GDP appears to have shown slower economic growth than countries with low ratio of natural resource export to GDP. Igberaese (2013) the phenomenon of slow growth in underdeveloped countries remains a topic researched by many economists over the years. It is this phenomenon that has caused economists to take sides on understanding as well as solving the problem of poor growth. While Adam Smith, David Ricardo and mainstream economists argued for the doctrine of comparative advantage, structural economists argued against comparative advantage and in favour of

diversification and industrialization.

This literature review will cover previous studies by mainstream economists that reference comparative advantage according to the Heckscher-Ohlin model of factor endowment. This literature will also examine new institutional economists who believe in comparative advantage but focus on the role of weak institutions, rent-seeking and corruption. The literature on structural economists will focus on the effects of commodity price volatility, volatility of terms of trade and specialization on growth.

Hamilton (2012) states that one of the most elegant theories in economics is Hotelling's (1931) characterization of the price of an exhaustible natural resource. From the perspective of overall social welfare, production today needs to be balanced against the consideration that, once consumed, the resource will be unavailable to future generations. One option for society would be to produce more of the commodity today, invest the current marginal benefits net of extraction costs in some other form of productive capital, and thereby accumulate benefits over time at the rate of interest earned on productive capital. An alternative is to save the resource that can be used in the future.

Mainstream economics argues that countries should produce and export according to their comparative advantage. The theory of comparative advantage suggests a country gains the greatest economic benefit relative to other countries by producing at lower overall cost commodities which a country has in abundance or can be easily produced. Other trading countries will therefore benefit if they accept the cost advantage of the trading country and focus on producing a commodity in which they have an advantage. It is this theory which guides mainstream economists belief in free trade, specialization and the international division of labour. This is their reasoning behind why some countries produce agricultural and mineral commodities while others produce industrial goods (O'Toole 2007). The doctrine of comparative advantage according to the Heckscher-Ohlin (HO) theory states that countries produce and export the commodities which require the use of its abundant productive factors intensely (Feenstra, 2003). This model is based on two countries, two goods and two factors and assumes that both countries have identical technologies, identical tastes, free trade in goods and different factor endowments. As long as two countries have different factor endowments, they will benefit from trade. It is the difference in factor endowments that leads to specialization and exporting goods in which a country has a comparative advantage. Mainstream economists believe that this process allows for efficient use of resources which lead to more gains from trade (WTO, 2010).

Literature on comparative advantage and the HO model attempts to show evidence that growth is dependent on a country's comparative advantage. For

mainstream economists, as long as developing countries continue to produce and export the commodities in which they possess and can produce intensely, a country will inevitably grow. However, many questions are raised by economists on the literature of comparative advantage because markets and information are not perfect as most of the previous studies assume.

New institutional economics (NIE) is a sub group of mainstream economics which suggests that mainstream economists assumptions of perfect information, no transaction costs, perfect competition and unbounded rationality are not always valid. NIE instead studies the written and unwritten rules and laws which govern society and government and are meant to control society and reduce uncertainty. They assume individuals do not have perfect information and due to their limited mental capacity create formal and informal institutions to reduce the risk of uncertainty and transaction costs. Individuals develop systems of organization to motivate agents. Therefore, the performance of the economy is dependent on the formal and informal institutions (Menard and Shirley, 2008). While mainstream economics focus on prices and outcome, NIE considers the effect of institutions. According to NIE, transaction costs are dependent on the institutional setting; therefore, the political institutions are influential in rules, laws and contracts (Menard *et al.*, 2008). However, both NIE and mainstream accept the assumptions of competition and scarcity (Menard *et al.* 2008). NIE attempts to answer the question surrounding the inability of countries to foster sustainable growth and looks to the role of institutions for the answer. According to NIE, countries with high transaction costs have less trade, specialization, investment and productivity. NIE ultimately believes that the quality of institutions will fundamentally determine the countries which experience good economic growth and the countries which do and not (Frankel, 2010).

Structural economists promote the idea of industrialization and less reliance on the production of primary products (O'Toole, 2007). They refute many of the claims of mainstream economists. In comparison to mainstream economists, structural economists believe that the economy is influenced by power and politics and markets were controlled by the elite who did little to create growth. Similarly while mainstream economists argued for free trade, structural economists argue that free trade leads to high development in the centre (developed countries) while harming less developed countries. As a solution to free trade, structural economists encourage developing countries to trade among themselves in order to reduce reliance on industrialized economies. The underlying theme of structural economics is the notion that developing countries are all characterized by free market failures therefore there is a role for the state to play to ensure development (O'Toole 2007). Prebisch and Singer (1950) as cited in Igberaese (2013) focused on diversification into manufacturing as the key to growth.

They and all structural economists argued that diversification is key to growth but diversification into manufactured goods will lead to long run sustainable growth. While the rapid growth in East Asian countries has been associated with the regions transformation from a primary commodity exporter to industrial sector exports, countries in Latin America and Sub Saharan Africa have not moved towards manufacturing and are primarily still resource based economies (Gelb, 2010).

Structural economists argue against many of the assumptions of mainstream and new institutional economist but do not disagree with the importance of institutions. They emphasize the importance of sustained growth and admit that only in the short run can growth be achieved through resource dependency. However, this study focuses on their argument for industrialization and manufacturing as the solution to poor growth. It is necessary for countries to industrialize and diversify its economy into manufacturing sector in order to ensure sustained economic growth.

REVIEW OF EMPIRICAL STUDIES

Studies in the past have discussed oil dependency and its effect on Nigeria's economic growth, which have provided evidence that there is indeed a relationship between the two. However, those studies did not clearly emphasize the importance of diversification, industrialization, privatisation and commercialization; hence there is a gap to be filled by this study. The belief is that the debate about oil dependency and economic growth is most useful when discussed with diversification, industrialization, privatisation and commercialization strategies.

Related empirical studies on Oil price volatility and economic growth conducted for some time now dealt on experiences garnered from scholars in developed countries and developing countries like Nigeria with various findings. Akide (2007) investigated the impact of oil price volatility on economic growth indicators in Nigeria using quarterly data from 1970 to 2000. He found out that within the period of study oil price shocks did not affect output and inflation in Nigeria, but significantly influenced real exchange rate. Ani, Ugwunta, Oliver and Eneje, (2014) investigated oil price volatility and economic development, for the period 1980 – 2010, the results suggest that in the short run, changes in the gross domestic product (GDP) is not influenced by oil price volatility, nor do we find evidence of influence on key macroeconomic variables. Again the findings indicate that there is a positive but insignificant relationship between oil price and the Nigerian Gross domestic product. Overall oil prices have no significant impact on real GDP and exchange rate in Nigeria. The result suggests that Nigeria has a special case of the Dutch Disease, where a country seems good fortune proves ultimately detrimental

to its economy.

Apere and Ijeoma (2013) investigate the time-series 1970 to 2009 relationship on the impact of oil price volatility on macroeconomic activity in Nigeria using exponential generalized autoregressive conditional heteroskedasticity (EGARCH), impulse response function and lag-augmented VAR (LA-VAR) models and found evidence that a unidirectional relationship exists between the interest rate, exchange rate and oil prices, with the direction from oil prices to both exchange rate and the interest rate. However, a significant relationship between oil prices and real GDP was not found.

Igberaese (2013) attempts to answer the question of, if the volatility of global oil prices is directly linked with the volatility of economic growth in Nigeria and uses GDP as the key variable for economic growth. An exploratory data analysis is employed using secondary data to examine the relationship between oil and GDP and the effect it has had on Nigeria's growth since 1961. The research found that there is a significant and positive relationship between oil dependency and economic growth in Nigeria. In the short-run, Nigeria was able to have increasing, yet volatile 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 had a negative effect on Nigeria's economic growth. Aremo *et al.* (2012) Investigate oil price shocks and fiscal policy management; Implications for Nigerian economic planning and the results showed that oil prices have significant effect on fiscal policy in Nigeria within the study period of 1980 to 2009. The study also revealed that oil price shock affects government revenue and GDP first before reflecting on fiscal expenditure. The study suggests strongly that diversification of the economy is necessary in order to minimize the consequences of oil price fluctuations on government revenue, by implication government expenditure planning in the country.

Oriakhi and Osaze (2013) examine the consequences of oil price volatility on the growth of the Nigerian economy within the period 1970 to 2010. Using quarterly data and employing the VAR methodology, the study finds that of the six variables employed, oil price volatility impacted directly on real government expenditure, real exchange rate and real import, while impacting on real GDP, real money supply and inflation through other variables, notably real government expenditure. This implies that oil price changes determine government expenditure level, which in turn determines the growth of the Nigerian economy. This result seems to reflect the dominant role of government in Nigeria.

This study agrees with the findings of Aremo *et al.* (2012) and Oriakhi and Osaze (2013) that oil price volatility affects the macroeconomic variables that determine the rate of economic growth. In other to minimize the negative effects of oil price volatility and ensure sustainable economic growth, Nigerian government should endeavor to have increase production

in non-oil sector, diversifies and industrialize her economy, have fiscal prudence, reform in budgetary operations, export diversification, accountability and ensure good corporate governance.

CONCLUSION AND RECOMMENDATIONS

This study examined the effect of oil price volatility on Nigeria's economic growth. The findings from previous studies vary with some concluding that oil price volatility has no real influence on the rate of Nigeria's economic growth. Other studies however suggest otherwise. As an oil exporter, Nigeria has pursued a resource based growths strategy since independence but has been unable to achieve sustainable economic growth. Although current growth rates average 7 percent, the country remains dependent on oil revenues to transform the economy. Volatility in oil prices have negative or positive impact on the revenue generated and by extension on economic performance.

Empirical and conceptual literature studies revealed that Oil dependency has been the basis of economic growth in Nigeria since the 1960s. Between 1970 and 2000, growth rates were very volatile in much the same way as oil prices. From 2000 onwards, oil prices increased resulting in increased economic growth in Nigeria. Oil dependency in the short run resulted in volatile, yet rapid economic growth in Nigeria, however in the long-run oil dependency has caused the Nigerian economy to become stagnant. This is due to Nigeria's inability to diversify its economy, address issues of employment, low productive capacity, endemic corruption and implement privatization and commercialization policies effectively. Nigeria's recent rapid growth is due to the increase in oil prices. Oil dependency based growth was found not to be successful for Nigeria on the long run. While growth was achieved on the short run, the Oil dependency based growth strategy has not led to continuous and consistent growth for the economy thereafter.

This study provides consideration for the Nigerian government for increase production in non-oil sector, diversifies and industrializes its economy, fiscal prudence, reform in budgetary operations, export diversification, revival of the non-oil sector of the economy, accountability and corporate governance while at the same time avoid waste through privatization and commercialization of government owned corporations. It is our belief that when these measures are put in place, Nigeria will be able to have sustainable economic growth that is not susceptible to the vagaries of oil price volatility.

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