OIL-PRICE SHOCKS AND ECONOMIC GROWTH: A REVIEW OF LITERATURE

Abstract

This study reviews oil-price shocks and economic growth with the aim of providing an in-depth knowledge based on the existing literature. The study uses content analysis coupled with trends analysis from 1981-2020. Brent crude oil price which represents a uniform substitute for oil price at the international oil market is used. Six (6) theories that links oil price and economic growth are considered. Out of the theories, the study anchors its theoretical framework on Dutch Disease Theory because the neglect of other sectors especially the developing oil-exporting/producing countries due to the discovery of natural resources (crude oil) has affected their economic growth. Documented evidences show that shocks in oil price hinder economic growth. The trend analysis also indicates unexpected movements in oil price (increase/decrease) whenever there is a shock. Based on this, necessitates the need for most oil-producing developing countries to look beyond the oil sector to prevent their economies from being mono-culturally based by developing indigenous products and in this process reduce the importation of those goods that can be produced locally.

Keywords: Oil-price Shocks, Economic Growth, Dutch Disease Theory, A Review of Literature

1.0 Introduction

The importance of crude oil as the main natural resources that represents an indisputable input for production, social development and economic growth is not deniable. In this regard, most developing oil-producing/exporting countries through international trade have been able to improve their earnings and economic growth through proceeds coming from crude oil export but in recent times, this has been truncated by frequent shocks occurring to the prices of oil. This study therefore rest on previous studies to provide a theoretical explanation on the review of oil-price shocks and economic growth.

1.1 Oil Price Shocks

Oil price denotes the average ratio of world nominal oil denominated in US dollars with the consumer price index of the US, while shocks in the oil price are majorly explained in terms of fluctuations in price which led to a sharp adjustment in either the demand or supply side of the global oil market (Akpan, 2009; Djebbouri, 2018; Wakeford, 2006). These changes could be due to supply-side interruption which can be supply quotas from the OPEC, political disruption within and outside the country, a meltdown in the global economy and the prevailing activities of the militant groups experienced in most countries. In this same direction, Aminu (2016) notes that oil price shocks arise from three main outcomes: shortfall in the supply of oil; an increase in oil demand and other factors which may be geological incidents or arising as a result of wars among countries.

The shocks could occur in two ways: positive (a rise) and negative (a fall) shocks (Bernanke, Gertler & Watson, 1997). The shocks can be quantifiable in absolute terms or as percentage changes based on the magnitude at which the price increase and could be the rate prices persistently increase which is the timing of the shocks. In line with the oil price trend, the first shocks in oil price began in the early 1970s which took place from 1973 to 1974 following the embargo from OPEC. During these periods, Hamilton (2011) documents that Egypt and Syria launched a military attack on Israel and as a result, the Arab group among the OPEC places a ban on those oil exporting countries that helped Israel and consequently, the production of oil declined thereby causing upward pressure on the price.

Following this period is the second oil shock which occurred from 1978-1979 due to the Iranian revolution. These periods witnessed a cut in oil production by the Iranian nation and consequently brought about a positive oil price shock. The third phase of oil shock came after the Iran-Iraq War (1980-1981). During the second and third phases of oil shocks (1978 and 1981), Hamilton (2011) and Kilian (2008) believe that the real price of oil had doubled. The fourth oil shock (1981 to 1986) that led to a sudden decline in oil prices can still be traced to the Iran-Iraq War. In the later part of 1986, Saudi Arabia had ramped the production of oil results in a sharp decline in oil prices from USD 27 per barrel to USD 12 per barrel (Aminu, 2016; Hamilton, 2011). The Gulf War of 1990-1991 leads to the fifth oil price shock. During this period, oil price witnessed a slight increase at the international level and this vanished within a short time.

The periods 1997 to 2000 also witnessed another decline in oil prices as a result of the Asian crisis caused by financial system problem that occurred in the East Asian countries. During this period, prices of oil fell reaching the lowest recorded level since 1972 in real terms (below USD 12). Another phase of oil shock happened in the second half of 2002 and the first half of 2003 following the unrest in Venezuela and the second Persian Gulf War. This shock was characterised by a short period of oil spike at the international level which eventually disappeared during the second half of 2003 (Aminu, 2016; Hamilton, 2011).

However, the rise in demand without a corresponding increase in supply is seen as a major factor responsible for the positive oil price shock experienced during 2007 to 2008. The hard-hit witnessed in the world due to the unexpected drain in the liquidity of 2008 in the global financial system following financial and economic crisis led to this shock. This causes oil prices to plummet reaching 44 USD per barrel in the earlier part of 2009 leading to the rapid crash in the flow of oil price (Aminu, 2016; Hamilton, 2011; Ikechi & Anthony, 2020). The oil shocks of June 2014 and March 2015 were caused by the rapid increase in the supply of oil among the European economies while the demand for oil among the emerging markets falls (Akpan, 2009). As of 2019, the future of the global crude oil market remains uncertain as the average price stood at 60.05 USD per barrel. However, in 2020, crude oil plummets again due to the shortage caused by the wave of the covid-19 pandemic. This results in the short down of global operations which affects the physical delivery of crude oil internationally (Ikechi & Anthony, 2020).

However, each of these shocks results in movements in the economic variables and invariably with the growth of the economy among nations of the world (Eagle, 2017; Stern & Cleveland, 2004). The effect of this increase that cannot translate to meaningful economic growth and development among countries especially the developing nations producing oil lead to the paradox of plenty which is the basis for Resource-Curse Theory and the Dutch disease syndrome of oil-producing developing countries.

On a global level, analysis of price movements in crude oil can be grouped into three sub-periods, with each of those periods' centering around the determination of price (Nkomo, 2006). The first period witnessed the era when the prices of crude oil were fixed by the international oil companies. The period was characterised by irregular price shocks against frequent shocks in oil price. The period lasted until the OPEC producers in 1974 took over the responsibility of fixing the reference price and act in that capacity until 1986. However,

1986 witnessed another dimension in the determination of crude oil as the prices were determined in London and New York in the features exchange for West Texas Intermediate. The resultant effect among the crude oil traders is the fear of future development leading to uneasiness about the security of supplies.

1.2 Oil Price Movements

Oil price movement refers to an upward or downward adjustment in the prices of crude oil. However, there are various barrels of oil price quoted at the international oil market which includes: West Texas Intermediate (WTI); OPEC basket price; Brent Blend and the New York Mercantile Exchange (NYMEX) futures price among others. Among all these, Brent crude oil price which represents a uniform substitute for oil price according to Akinsola and Odhiambo (2020) was used to illustrate the movement in oil price because it serves as a major benchmark in the global world market. This trend is, however, illustrated in Table 1 as well as Figure 1

Specifically, considering the period under review (1981-2020) world oil price has been fluctuating over time. This fluctuation is evident as revealed in Figure 1. In 1981, oil price stood at 35.93 USD; this keeps dropping till it reaches 14.43 USD in 1986. The reason adduced to these shocks could be linked to the Iran-Iraq war. A slight increase in world oil price was also experienced in 1987 when the price of oil stood at 18.44 USD. This could not be sustained till the following year as the oil price changed again to 14.92 USD. From 1990-2001, the world witnessed another irregular fluctuation in oil price as the prices stood at 18.23, 23.73, 20, 19.32, 16.97, 15.82, 17.02, 20.67, 19.09, 12.72, 17.97, 28.5 and 24.44 (USD) respectively. Oil price increased again in 2002 to 25.02 USD till it reached 97.26 USD in 2008. However, the unexpected drain that leads to a shortfall in the liquidity of the financial system at the end of 2008 caused oil prices to experience another fall reaching 61.67 USD in 2009. These trends in oil prices continued till they reached 64.21 USD in 2019 and eventually dropped to 41.84 USD in 2020 due to the wave of the covid-19 pandemic.

Table 1: Brent Crude Oil Price Movement (1981-2020)

YEAR	OIL PRICE (USD)
1981	35.93
1982	32.97
1983	29.55
1984	28.78
1985	27.56
1986	14.43
1987	18.44
1988	14.92
1989	18.23
1990	23.73
1991	20
1992	19.32
1993	16.97
1994	15.82
1995	17.02
1996	20.67
1997	19.09
1998	12.72
1999	17.97
2000	28.5
2001	24.44
2002	25.02
2003	28.83
2004	38.27
2005	54.52
2006	65.14
2007	72.39
2008	97.26
2009	61.67
2010	79.5
2011	111.26
2012	111.67
2013	108.66
2014	98.95
2015	52.39
2016	43.73
2017	54.19
2018	71.31
2019	64.21
2020	41.84

Source: British Petroleum (BP) Statistical Review of World Energy Consumption, (2021)

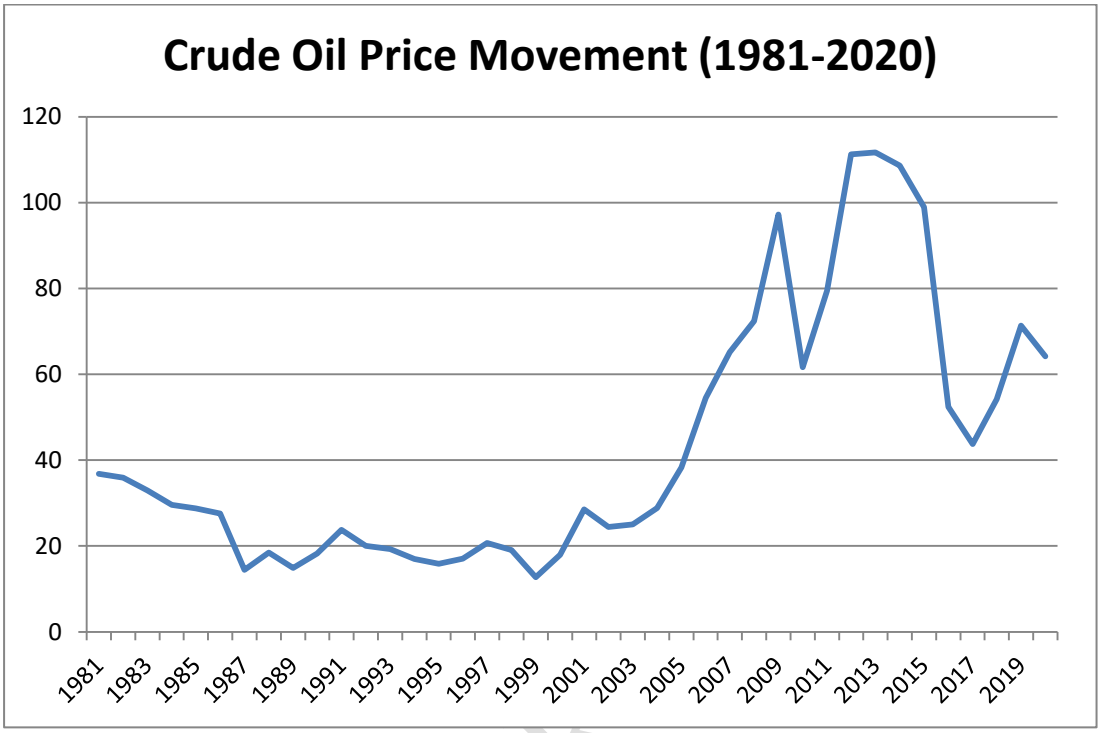

Figure 1 Oil Price Movements

Source: E-views, Version 12 (2022)

From the foregoing, it is indicated that world oil prices had experienced sharp jumps and drops which invariably had an impact on the growth of the economy.

1.3 Economic Growth

As noted by Eta and Anabori (2015), economic growth occurred when there is an increase in the GDP potentials or output of a country. In the view of Audu and Okumoko (2013), a country experienced growth when the output level of goods and services increased over a given period. In the determination of economic growth, a rise in GDP is usually used in measuring it. In real terms, it is calculated as a netting inflation effect on the producer's commodity price. Economic growth is observed for both shorter periods and longer periods. The short-period variation refers to a business cycle, at this stage, economies witness frequent recessions, while the longer periods of growth might not be easily determined in the sense that seemingly recorded small rates of growth could have a great effect. When output experiences growth, the situation can be categorised into two. The first one is the growth

recorded through increased input while the second is the one recorded through productivity improvements. Assuming that capital and labour input is constant over time, to accelerate the living standard in the long run, technological progress is needed (Audu & Okumoko, 2013).

Rana and Barua (2015) view economic growth as when per capita GDP increases or a rise in the measurements of aggregate income. To curtail the distorting effects of the oil shock, Audu and Okumoko (2013) explain that growth is mainly accessed in actual terms. This denotes a rise in the production outputs of an economy. To measure future economic welfare, per capital income increase is usually used. Therefore, to Rana and Barua (2015), a rise in per capita income serves as a good indicator of economic growth.

When there is a change in real output, economic growth is said to occur. These changes are usually expressed as percentage changes on annual basis (Baye & Jansen, 2006; Aretis, Baddeley, John & McConibie, 2007). The growth of an economy by Agbo and Nwankwo (2018) depends on some factors that occur in the long run. Those factors are the growth of the nation's stock of capital, the growth recorded both capital and labour productivity capital, the use of human resources, and improvements in technology. Rashti, Araghi and Shayeste (2014) view economic growth as the efforts made by separate economic agents to achieve a higher and better status of human welfare.

However, the growth of an economy for a long time has been viewed as an important goal of economic policy with numerous researches focusing on how this goal can be accomplished (Fadare, 2010). In the work of Khorravi and Karimi (2010), the growth of an economy is greatly connected with capital and labour being the factors of production. The roles played by other factors of production in explaining economic growth have been questioned with the emergence of the endogenous growth theory (Eta & Anabori, 2015). Economic growth measurements occurred when there are sustained population accompanied by product per capital.

2.0 Theoretical Literature

Numerous theories explaining the transmission mechanism through which shocks in oil price engender economic growth have been documented in the literature. However, this study is concerned with the theories that mostly explain the topic under consideration. That is, the theories that link oil price shocks and economic growth together. In what follows, the study attempts to highlight briefly six (6) of such theories, namely: Dutch Disease Theory;

Renaissance Growth Theory; Transmission Channels Theory; The Asymmetry Theory of Economic Growth, The Linear/Symmetric Growth Theory and Real Business Cycles (RBC) Theory. Explanations for these theories are thus provided.

2.1 Dutch Disease Theory

The classic economic model of "Dutch disease theory" was propounded in 1982 authored in Corden and Neary work. The theory explains the damages caused to the country's production system as a result of the boom in natural resources. It implies that an increase in natural resources will affect the economy through advancement in asset and spending effect. In other words, it denotes the structural disparity of the economy that results in unbalances of oil and non-oil sectors.

Corden and Neary (1982) classify economic sectors into two: the booming, otherwise referred to as the non-traded sector, and the traded sector. The formal (booming sector) represents the oil sector while the latter (lagging sector) denotes the agricultural and manufacturing sectors of the economy. When it is abundant, the economy can be affected from two angles: "spending effect & resource movement effect". The resource boom in the resource movement effect will push labour demand causing production to move away from the lagging sector to the booming sector. In such an instance, economy can be affected due to low employment created. The spending effect happens due to the additional revenue generated which pushes up labour demand in the non-tradable, causing labour to be shifted away from the lagging sector. Movement between these two sectors, according to Onakoya and Agunbiade (2020), is known as "indirect deindustrialisation". The rise for non-traded goods jacked up the price and because the price in this sector is determined internationally, it could not be easily changed (Akalpler & Nuhu, 2018; Olomola, 2007; Onakoya & Agunbiade, 2020).

For the past four decades, most oil-exporting countries in developing countries particularly in Africa have experienced the Dutch Disease Syndrome which according to Budina and Wijnbergen (2008) has created an avenue for structural imbalances for their economies. It is on this note that Mehlum, Moene and Torvik (2006) contend that a well-diversified economy might not likely experience this Dutch disease phenomenon while most countries in Africa due to their heavy reliance on oil revenue are easily afflicted by this disease. Therefore, this study anchored its theoretical framework on this theory because the impact brought due to the

discovery of natural resources (crude oil) on the economic growth of oil-exporting countries in Africa and other developing countries cannot be overemphasised.

2.2 The Renaissance Growth Theory

One of the advocates of the Renaissance Growth theory is Lee (1998). The theory serves as a fall-out/by-product of both symmetry and asymmetry effects of oil price shocks and economic growth. The Renaissance growth model emphasises that oil price shift produces negative effects on economic growth in varieties of ways (Ogboru, Rivi & Idisi, 2017; Oriakhi & Iyoha, 2013). The proponents of the theory discovered that both in the advanced and emerging economies, oil price impacts economic growth, though, the level of impact among countries varies significantly from each other. The degree of this variation among countries depends on the internal mechanism put in place for its stabilisation.

The choice of Renaissance growth theory of economic growth is informed by the close correlation it has with both oil price shocks and economic growth. More so, the theory was carved out from both symmetric and asymmetric in effect theories and as such supersedes the two theories.

2.3 Transmission Channels Theory

This theory originates from the work of Friedmon and Schwartz (1963). The theory is seen as a tool employed in linking the actions and outcomes of a group or factor within a country or outside the country. In the real sense, the channels of transmission could be transfer of income (from oil consumers to oil producers), sectoral shifts and could also be through endogenous monetary policy response (Weliswa, 2013). The supply-side view of the classical economist explained that crude oil represents the basic input used in production; an attempt to increase oil prices affects output due to a rise in the cost of production which reduces productivity in the country. A low rate of productivity declines real wage and triggers the rate of unemployment (Brown & Yucel, 2002; Kiani, 2008).

The transmission channel entails a wealth transfer effect that involves a transfer of income between two countries (oil-importers and exporters). The theory explains that when oil prices increase, countries that export oil get more income from countries that import oil. Weliswa (2013) observes that the impact of this income transfer is more felt on trade balance because

of the low consumption rate of the oil-exporting country; this boosts savings, therefore enhancing investment, while the rate of investment for oil-importing country decreases.

In the view of Brown and Yucel (2002), the stickily downward price reduces crude oil production and this reduces the growth rate of gross domestic product for countries producing oil. Another part of the transmission channel is the real balance effect as explained by Mork (1989). This occurs when an oil price increase results in a rise in money demand. This can also increase the inflation rate with the prevailing money supply which reduces the number of real balances. Reduced real balance produces recessions and then increases the rate of interest resulting in low aggregate investment and concomitant reduction in growth of the economy.

The sectoral movement/shifts according to Loungani (1992) explain that shift in oil prices provides a better explanation on the likely variation in the growth of output. Based on this, shocks in oil prices result in transient adjustment in aggregate unemployment inasmuch as workers in the affected sectors may choose frictional unemployment and wait until there is an improvement in their sectors.

2.4 The Asymmetry Theory of Economic Growth

This theory originates from the work of Mark (1989) and was later popularised Ferderer (1996). Explained in the theory are the asymmetry impact and the strength of oil price shocks on economic growth. The advocates of this theory, Ferderer (1996) concentrates on three possible ways such as sectoral shocks, counter-inflationary monetary policy and the uncertainly that provide in detail the asymmetric mechanism through which shocks in oil price influence economic growth (Eagle, 2017; Ogunsakin & Oloruntuyi, 2017; Igbinedion, 2019). The theory is based on a submission that relies solely on monetary policies cannot sufficiently revive the real effect of oil price fluctuations on economic growth. This assertion necessitates the use of fiscal policy to cushion this effect. This position was also supported by Igbinedion (2019).

2.5 The Linear/Symmetric Theory of Growth

The theory pioneered by Hamilton (1983) in his work conducted on the US economy contends that a significant inverse relationship subsists between oil price shocks and economic growth. Other proponents of this theory are Hooker (1986); Lee, Ni, and Ratti (1995); Gisser and Goodwin (1986) and Laser (1987). The theory hinges on what happened

at the international oil market in the year 1948-1972. After Hamilton (1983) discovery, scholars such as Igbinedion (2019) and Hooker (1986) discover that about 0.6% reduction in the growth rate of the gross domestic product resulted in a 10% increase in oil price. In the same vein, Laser (1987), who later came to join the symmetry school of thought, arrives at a similar conclusion that an increased shocks of oil price propels a reduction in gross domestic product and the effects vary from country to country. The resultant effect of such a sudden and unanticipated rise in price of oil according to Igbinedion (2019) and Rotemberg and Woodford (1996) is also seen in significant and asymmetry effects on macroeconomic variables and other forms of earnings.

2.6 Real Business Cycles (RBC) Theory

The theory of RBC postulated by Kydland and Prescott (1982) advocates that large fluctuations of business cycles affected by market dynamic can lead to innovative technology. The theory claims that fluctuation and economic crises emanated from external innovative technology. This could also be triggered by other economic and political factors such as oil shocks, a pandemic caused by a natural disaster, instability in government and many more (Murshidi & Aralas, 2017). This theory relates with the current study in that the price shocks of oil in this case represent the external shocks that may affect the growth of the economy.

However, two other factors could enhance the transmission of monetary to the real business cycle theory. The first one being supply shocks is associated with the 1970s increase in oil price by OPEC. This increases the awareness of the macroeconomist to the relevancy of supply-side factors in unfolding macroeconomic instability (Gazda, 2010). The second one suggests that in revealing the path of economic growth over some time, real shocks could be more beneficial than monetary shocks.

3.0 Empirical Review

3.1 Empirical Review across Countries

Employing Panel Auto Regressive Distributive Lag on samples of low-income countries in SSA, Akinsola and Odhiambo (2020) examine economic growth and asymmetry impact of oil price. The result shows that when a longer period was reached, a significant negative correlation is found between oil price and economic growth among the selected countries;

furthermore, decomposing oil price into net rise and decrease, the result shows that oil price decrease leads to a direct significant impact on economic growth while the reverse is the case for an oil price increase. Therefore, the study recommends inclusive modern technology at all levels to mitigate the risk inherent in oil price.

Chen, Jin, Ouyang, Ouyang and Wen (2019) conduct a study on oil price shocks, uncertainty in economic policy and China's economic growth. The study employs granger causality and VAR estimation techniques covering 2000-2017 monthly data. The result shows a bidirectional causal link between global oil prices and industrial economic growth in China. The asymmetry effect of oil price depicts a significant effect on the industrial economic growth of China.

Brucal and Roberts (2018) employ a structural decomposition method of analysis among the forth-eight (48) contiguous U.S. states to examine how oil price shocks affect both local and aggregate economies. The study discovers that shock in the oil price to different states varies depending on the magnitude of their dependence on oil. From the study, aggregate demand shocks exhibit an inverse relationship on the growth of the state economies irrespective of the oil production-consumption ratio. They, therefore, recommend better market integration to boost and ensure the stability of the regional economies.

Izekor and Aigbovo (2018) investigate causal implications between oil price shocks and foreign reserves in Nigeria from 1993-2017. In line with the Granger causality test, the study discovered that foreign reserves' depletion was caused by wrong policies initiated and implemented by the government and not caused by oil price shocks. Therefore, recommend the implementation of policies that would reduce the outflow of capital that may harm Nigeria's foreign reserves such as medical vacations for government officials and check the activities in the parallel market.

In a comparative study, Monjazeb, Souri and Shahabi (2013) examine if links exist between shocks in oil price and output growth among twenty-six (26) oil-exporting economies for the periods 1990 – 2009. They employ panel regression models that considered both fixed and random approaches. From their findings, shocks in oil price indicate a significant positive relationship on the growth rate of a gross domestic product while the reverse is the case when considering fixed effect results.

4.0 Conclusion and Recommendations

The concept of oil price, economic growth, movement in oil prices are illustrated with trend analysis. Six (6) theories that links oil price and economic growth are considered while empirical reviews from other scholars are also documented in the study. The study uses content analysis coupled with trends analysis. Brent crude oil price which represents a uniform substitute for oil price at the international oil market is used from 1981-2020. From the reviewed literature, the study shows that shocks in oil price affect the smooth operations of the economy especially the oil-producing/exporting countries. The trend analysis also indicates unexpected movement in oil price (increase/decrease) whenever there is a shock. The study concludes that world oil prices had experienced sharp jumps and drops which invariably had impact on economic growth. Based on this, necessitates the need for most oil-producing developing countries to look beyond the oil sector to prevent their economies from being mono-culturally based by developing indigenous products and in this process reduce the importation of those goods that can be produced locally.

COMPETING INTERESTS DISCLAIMER:

Authors have declared that no competing interests exist. The products used for this research are commonly and predominantly use products in our area of research and country. There is absolutely no conflict of interest between the authors and producers of the products because we do not intend to use these products as an avenue for any litigation but for the advancement of knowledge. Also, the research was not funded by the producing company rather it was funded by personal efforts of the authors.

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