Oil Revenue, Portfolio Investment and Economic Growth in Nigeria and United Arab Emirates

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Abstract
The general perception of resource-rich countries is that they are wealthy. Natural resources, however, do not automatically translate into economic growth and national transformation. The relationship between oil revenue, portfolio investment, and economic growth in Nigeria and UAE from 1970 to 2019 is therefore examined in this study. The study employed a structural vector autoregressive model (SVAR) for data analysis. Result shows a strong bidirectional relationship between oil revenue and economic growth in UAE at 5% level of significance. The study also found that portfolio investment in UAE yields a stronger positive influence on economic growth than in Nigeria in terms of magnitude and level of significance. Results also indicate that oil revenue has a favourable impact on economic growth in Nigeria and the United Arab Emirates, and the estimates are statistically significant at the 5% level of significance. The study infers that portfolio investment has a weak influence on economic growth in both countries while oil revenue strongly determines economic growth in Nigeria and UAE. Thus, there exists a positive but weak transmission running from oil revenue to economic growth in Nigeria and UAE through portfolio investment but with a relatively higher influence in UAE than that of Nigeria. It recommended among others that there is a need for various governments to double their efforts at improving the investment climate in the portfolio using proceeds from oil sales.

Keywords: Economic growth, oil revenue, portfolio investment

1 Introduction

The general expectation about resource-abundant nations is that they are wealthy. However, natural resources do not automatically translate into economic growth and transformation of the nation. Recent empirical findings in development economics have found resource abundant economies developing slower than economies with insufficient resources (Auty, 1993; Olomola, 2007, Asogwa & Okpongette, 2016; Omodero & Ehikioya, 2020). Such findings are also among the case studies by Gelb and Associates (1988) and have been backed up by other case studies by Karl (1997) as well as in econometric studies by Gylfason, Herbertson and Zoega (1999) and Busby, Isham, Pritchett and Woolcock (2005). In a comparative study, Fefa (2017) also found in the case of Nigeria that abundant oil resource in the nation has not translated into an effective wealth creating ventures to achieve the desired economic growth.

A theoretical explanation for this paradox is found in the *Dutch disease* model. The *Dutch disease* phenomenon emerges when the development of a natural resource-based sector, induced from sudden abundance or a price increase, occurs at the expense of a non-resource traded goods sector (Fefa, 2017). The deindustrialization and/or deagriculturalization, a sustained appreciation of the actual exchange rate, and reallocation of the factors of production are the most frequently noted effects of the Dutch plague. These observations come from what is refers to as the resource-movement and spending impacts in literature. Natural resources availability does not signify a resource curse or Dutch disease necessarily, countries with more resources fall behind resource-poor nations on average (Mikesell, 1997; Olomola, 2007). The spill-over effect of this phenomenon is observable in the low growth level of the economy and economic development abundant resource countries.

One of the factors responsible for the existence or not of the *Dutch disease* is the management of available resources through the flow of capital (Kuwimb, 2010) Capital inflows are a key source of funding and, consequently, investment in the recipient nations, promoting growth (Fernandez-Arias & Montiel 1996), promoting knowledge transfer in management and technology, and enhancing the functionality of domestic financial markets (Borensztein, De Gregorio & Lee, 1998).

Capital flows are divided into two types: foreign aid and foreign private investment. Foreign private investment is the most important source of foreign capital. Foreign private investment is further divided into Foreign Portfolio Investment and Foreign Direct Investment. Portfolio investment is a cluster of financial investment instruments. These financial instruments are easy to trade and are less eternal. These instruments are not a representation of long-run interest. They include stocks, bonds, debt securities, dividends and mutual funds of different businesses from abroad and domestic. Portfolio investments give the investors dividend payments, possible voting rights and ownership of a part of the company (Chaudhry, Farooq & Mushtaq, 2014). Portfolio investment leads to a capital structure of firms improving the managerial incentives and firm's value (Chaudhry, *et al*. 2014). When portfolio investment rises, it leads to improvement in the economy as it will improve opportunities of employment, business sector performance, per capita income, GDP growth, exchange rate stabilization, balance of payment improvement. Portfolio investment flows also increase foreign reserves with a positive impact on stabilization of exchange rate (Chaudhry, *et al*. 2014). Natural resources availability (for instance, oil) provides a level playing ground for the flow of international portfolio investment.

Nigeria is one of the top ten oil exporters in the world. However, its economy had been stagnant and failed to alleviate poverty (Budina, *et al*. 2007). As an illustration, in 1965, when oil revenues per annum were approximately US $33 billion, the per capita GDP of Nigeria was US $245. In 2000, when oil revenues were US $325 billion, the per capita GDP remained at the 1965 level, US $245 (Kablan & Loening, 2012). In 2012, when cumulative oil revenues were well over US $402 billion, the per capita GDP of Nigeria was US $1,630.00 (IMF, 2012) which was still considered negligible for enhancing the welfare of Nigerians. These statistics suggest that oil revenues, estimated at US $402 billion, did nothing to improve the standard of living in Nigeria and, in fact, may have degraded it. Even though with oil revenues, the annual real GDP growth in Nigeria was estimated to be 7.5% on the average over 2003-2011 (IMF, 2012), many researchers have reported that Nigeria is suffering from the Dutch disease (Roemer, 1994; Rudd, 1996; Gylfason, 2001; Olusi & Olagunju, 2005; Olomola & Adejumo, 2006; Olomola, 2007; Mehlum, Moene & Torvik, 2008; Kablan & Loening, 2012; Otaha, 2012; Bamiduro, 2012; Chambas, 2013; Jadhav, 2014). Portfolio investment in Nigeria has also remained low over the years. Low portfolio investments were recorded in Nigeria so many years between 1984 and 2015 (World Bank, 2017).

On the other hand, oil was discovered in Dubai in 1958 at the Offshore Fetch field. In 1971, the United Arab Emirates (UAE) was created with the intention of promoting wealth and security among its members. Since then, the UAE has successfully transformed into a rapidly modernizing nation that is quickly emerging as a significant economic hub and a crucial player on the global economic landscape (Nyarko, 2010; OPEC, 2021), partly as a result of the historical turning point (discovery of oil). With a booming economy the United Arab Emirates has emerged as a key economic player, whether it is in the field of tourism, investments made through its sovereign wealth funds, or the ownership of significant businesses like Dubai Ports (World Bank, 2017). Many political economic ideas contended that the existence of oil in nations like the United Arab Emirates might result in a more gradual restructuring of the economy. There are other instances of other nations that have wasted their substantial oil reserves and where the existence of oil has led to civil unrest and subpar economic growth (Nyarko, 2010). However, the UAE has been able to achieve political stability and robust economic growth because to policies like leveraging oil profits to hire foreign workers: high skilled labor, predominantly from the west, and low skilled labor, primarily from Asia. The UAE's economic strategy is, in many aspects, in line with what is recommended in a textbook on free market economics. Today, one of the biggest nations in terms of economic influence is the United Arab Emirates. These accomplishments have been made

despite relative poverty that was present only 50 years ago. The UAE's economy has impressively expanded at an average annualized real rate of 5.5% in the nearly 40 years since independence, and an average of around 6.1% over the previous two decades (World Bank, 2017). In terms of GDP per capita, the UAE is ranks among the richest nations in the world, frequently ranking in the top 20 nations and, by some measurements, frequently among the top five (International Monetary Fund, 2015).

Many resource-abundant nations that have been able to achieve high level of success in managing their resource wealth to achieve economic growth have almost always done so through specific targeted portfolio investments. In particular, Sovereign Wealth Funds are used as the channel for transmitting these portfolio investments to achieve growth as in Norway (Government Pension Fund Global), Saudi Arabia (Saudi Arabian Monetary Agency Foreign Holdings and Public Investment Fund), Botswana (The Pula Fund), Qatar (Qatar Investment Authority), Russia (Reserve Fund and the National Wealth Fund of the Russian Federation, Russia Direct Investment Fund, Russia National Welfare Fund and Russia Reserve Fund), and United States (Alabama Trust Fund and Alaska Permanent Fund Corporation) among others (Pouokam, 2021).

Even though Nigeria started commercial oil production in 1956 and UAE started in 1960, both countries benefited from the proceeds of the first oil boom in 1970s (Pouokam, 2021). UAE is however, one of the top 20 richest economies in the world, while Nigeria in contrast is still ranked among the twenty-five poorest economies (World Bank, 2020). There is something similar that exists between Nigeria and UAE. When oil was just discovered, both countries were ranked as low income countries (IMF, 2020). Also, both countries benefited from a sudden and phenomenal rise in oil wealth arising from unprecedented increases in crude oil prices of the early 1970s (Nyarko, 2010).

The Nigeria Sovereign Investment Authority (NSIA) was also founded in Nigeria as a replacement for the Excess Crude Account (ECA) in 2011 to manage the Future Generation Fund, Nigerian Infrastructure Fund and Stabilization Fund (Ahmed, 2019). The primary goal of these funds is to invest in a diverse portfolio of suitable growth assets in order to give the next generation of Nigerians a strong savings basis, as well as to invest in infrastructure and stabilize Federation revenue during economic turbulence. NSIA, however, is still considered to have one of the lowest portfolio investment values among the world's smallest sovereign wealth capital of $1.704 billion in 2016 (World Bank, Index Mundi, 2019).

While there are many empirical studies on oil revenue and Nigerian economic development (Asogwa & Okpongette, 2016; Alley, Asekomeh, Mobolaji & Adeniran, 2015; Odularu, 2008) with few comparisons between Nigeria and Norway (Fefa, 2017). Thus, how United Arab Emirates has been able to achieve oil independence has not been properly investigated. It therefore makes empirical sense to examine how Nigeria too can achieve oil independence through portfolio investment. In addition, for the fact that Nigeria has been caught in the resource and capabilities curses (Fefa, 2017), the use of oil revenue as a direct link to the growth of Nigerian economy can be temporarily exempted. This point to the need to assess the possible channels of transmission of oil revenue to achieve economic growth in Nigeria. Proceeds from oil exports in other oil rich countries such as Norway, Azerbaijan, United Arab Emirates have been re-invested in portfolio investment to raise capital formation. It therefore suffices to ask whether portfolio investment could be an important channel for transmitting oil revenue to achieve growth of the economy in Nigeria as investigated. The, study also investigated how Nigeria and United Arab Emirates have differently managed their oil revenue through portfolio investments to achieve economic growth.

The study is significant because it presents an opportunity for a further review of the portfolio investment theory and the resource curse hypothesis. The results of this study's research will expand and extend the resource curse hypothesis and the theory of portfolio investment towards the political economy of Nigeria and United Arab Emirates by taking into consideration. The result has immense benefit to policy makers and economic planners especially in Nigeria in terms of using its findings to formulate appropriate policies on Nigeria's management of oil revenue for economic growth.

2 Theoretical Framework

Relevant to this study are resource curse thesis and portfolio investment theory. In his 1993 book Sustaining Development in Mineral Economics: The Resource Curse Thesis, Auty originally presented the resource curse thesis. The book's introductory paragraphs were written. According to Auty (1993), a favourable natural resource endowments may not be as advantageous for developing nations with low and middle income levels as previously thought. The new research suggests that many resource-rich developing nations may not only benefit from their fortunate endowment but may actually outperform others with less endowment. According to the resource curse hypothesis, economic expansion that results from a natural resource boom does not always lead to Dutch sickness or the natural resource curse (Sachs & Warner, 1997; Collier & Hoeffler, 2002). According to the notion behind oil-led development, nations who are fortunate enough to have this resource can use it to support their economic growth (Yakubu, 2008; Hoffman, 1999). However, the experience of nearly all oil-exporting nations, particularly Nigeria, to date, only displays a handful of these advantages (Terry, 2000).

Harry Markowitz (1952) presented a portfolio selection theory. It highlights the idea that higher risk is a required ingredient of higher gain and is based on the idea that risk-averse investors can build portfolios to optimize or maximize expected return given a specified degree of market risk. It is among the most significant and well-known economic theories with regard to money and investing. The "efficient frontier" of ideal portfolios that provide the best predicted return for a particular amount of risk can be created, according to MPT, also known as "portfolio theory" or "portfolio management theory." Diversification, commonly known as not placing all of your eggs in one basket, has advantages that are quantified by MPT. The theory assumes that the process of selecting a portfolio is divided into two stages. The first stage starts with observation and experience and ends with beliefs about the future performances of available securities. The second stage starts with the relevant beliefs about future performances and ends with the choice of portfolio

Söhnke and Gunter (2001) expanded the theory of portfolio investment to include the entire world. Due to the numerous advantages of investing globally, the concept of doing so initially sounds thrilling and full of promise. The risks and limitations of foreign portfolio investment must not be disregarded, despite the fact that these benefits could seem alluring. Financial investments in a global context are constrained by a range of institutional barriers, notable among them a variety of tax regulations. While being lessened by technology and legislation, these limitations strengthen the argument for globally segmented securities markets, with associated advantages for those who do so successfully.

3 Empirical Review

Omodero and Ehikioya (2020) looked Nigeria's oil and non-oil revenue over the years 2005–2019. The study used time series data that was subjected to vector error correction mode analysis. Exchange rate and oil revenues based on estimates exacted considerable detrimental influence on infrastructure. Also, the revenue from non-oil has a significant impact on the country's infrastructure development. Between 1981 and 2014, Oil revenue and output growth in Nigeria were examined by Asagunla and Agbede (2018). Using fully modified ordinary least squares approach, with the Beghebo and Atima model, findings showed that Nigeria's economic activities are not immediately impacted by oil money. However, this policy's long-term effects were genuine on some level, as it turned out that Nigeria's economy will eventually grow as oil revenues continue to rise. With analytical difference, Nyang'oro (2017) used a framework of generalized methods of moment (GMM) models and investigated the effect of capital flows on economic growth in sub-Saharan Africa using data from 1980 to 2011. According to result of the study, while debt and private equity are harmful for economic growth, portfolio equity was beneficial. Growth was favourably benefited by total gross inflow volatility and total net inflow volatility, but growth was negatively impacted by total capital inflows, both gross and net.

To show how foreign portfolio equity investments impacted economic growth, Tsaurai (2017) analyzed using panel data from 14 developing Asian and European countries. For a time period extending from 1998 to 2015, the potential endogeneity problem between foreign portfolio investments and economic growth as well as the dynamic character of economic growth data were taken into account using Generalized Methods of Moments (GMM). Based on the outcome, foreign portfolio equity investments had insignificant impact on economic growth. Using the Wald causality technique. In a different study, Fefa (2017) compared Norway's and Nigeria's economic growth using a comparative analysis method to evaluate oil revenue. The research made used of data obtained between 1970 and 2014. The vector autoregressive (VAR) and Johansen cointegration models were employed in the investigation of the long-term effects of oil revenue on economic growth in Nigeria and Norway. The research discovered that oil revenue had significant long-lasting negative impact on Nigeria's economic growth, unlike the significant long-run impact on Norway's. The channels of oil revenue transmission used to promote economic growth in Nigeria revealed that the Norwegian economy was a "healthy-producing economy" and the Nigerian economy was a "diseased consuming-economy". In the end, it was determined that Nigeria, in contrast to Norway, lacked the capacity to manage its oil earnings and was victim to the resource curse.

Adopting a different methodology, Asogwa and Okpongette (2016) examined how Nigeria's macroeconomic performance is impacted by oil revenue in light of the oil revenue stream and the nation's weak pace of economic growth with the data between 1981 and 2014. Using the Granger Causality test and the Ordinary Least Squares (OLS) techniques, results showed a statistically significant correlation between oil revenue and Nigeria's economic expansion as well as a favorable relationship between both. Granger's causation test, however, reveals that oil revenue does not, in fact, drive economic growth.

In order to determine how Nigeria's oil revenue, non-oil revenue, and state debt divided into domestic and external debt affected the nation's economic growth, Okwori and Sule (2016) used data from 1986 to 2013 while cointegration Test was employed for analysis. Findings revealed that oil revenue, non-oil revenue) with the exception of domestic debt, have a long-term beneficial relationship with Nigeria's economic growth. Khalid and Azrai (2015) looked into the effects of oil revenue and the Sudan's service GDP from 2000 to 2012. The findings show a connection between oil revenue (an independent variable) and service GDP (dependent variables). According to the findings of regression analysis, oil revenue favorably influences the GDP of the service sector. Kwasi and Sulemana (2010) further investigated the contribution of oil to the economic development of Ghana with particular emphasis on foreign direct investment and government policies. The study made use of data covering 2000 to 2008. Using OLS, The study found that the availability of natural resources (oil) and its ability to attract foreign investment does not guarantee economic development. The establishment of appropriate institutions, mechanisms and policies would ensure efficient use of oil revenue for sustained economic growth. The study, however, fell short of any empirical investigation as it is only a descriptive analysis. The study also focused on foreign direct investment with considering foreign portfolio investment. However, the study's primary focus was focused on the service GDP, which does not necessarily indicate that the overall economy is growing. From the reviewed studies, the transmission channel involving portfolio investment and oil revenue was not addressed in the previous study. Thus a gap on how economic growth respond to oil revenue through portfolio investment still exist

4 Methodology

Kinds and Sources of Data

The kinds of data required for the study are basically secondary which were collected on real Gross Domestic Product (absolute values and growth rate), oil revenue, portfolio investment, oil exports and oil revenue growth rates ranging from 1970 to 2019. The data was gathered from the works of the Nigerian Central Bank, Knoema (CBN), Fraser Institute for Economic Freedom World Database, Transparency International, OPEC, IMF and World Data Bank.

Model Discussion and Specification

By virtue of the fact that Nigeria has been caught in resource curse, it becomes doubtful whether revenue from oil has a direct effect on the Nigerian economy. Portfolio investment therefore becomes a possible link between oil revenue and economic growth. According to Esfahani, Mohaddes and Pesaran (2012), natural resource availability (for instance oil) provides a level playing ground for the flow of international capital (including portfolio investment). The study therefore set portfolio investment as a function of oil revenue, as follows:

$$PI = f(OiREV) \quad 1$$

Where; PI is portfolio investment and OiREV is oil revenue.

The theory of portfolio investment, according to Sohnke and Gunter (2001), allows for investment in the development of other nations. Similarly, other major oil exporting countries such as Norway, United Arab Emirates, Azerbaijan have acquired massive capital stock by re-investing the proceeds from oil exports into portfolios.

To examine the transmission from oil revenue to achieve growth in Nigeria and United Arab Emirates economies through portfolio investment, the relevant SVAR(p) model for the study is expressed. Thus, Oil revenue boom is expected to improve the ease of doing business. Increase in the ease of doing business is a significant pull factor for foreign investment. Foreign investment in turn increases the investment component of the GDP. Thus, rise in oil revenue is expected to lead to economic growth through increase in foreign portfolio investment. The portfolio investment channel of economic growth through oil revenue can therefore be expressed symbolically as:

$$OiREV_t \longrightarrow PI_t \longrightarrow RGDP_t$$

Using (p) as the ideal lag length, the general SVAR(p) model can be written as:

$$A_0 Y_t = A_1 Y_{t-1} + A_2 Y_{t-2} + \cdots + A_p Y_{t-p} + \varepsilon_t \quad 2$$

where A_0 is a matrix of contemporaneous coefficients.

The SVAR(p) model can be described in the following manner to reflect the contemporaneous effect;

$$\begin{aligned} RGDP_t = {} & \Pi_{11}^1 RGDP_{t-1} + \Pi_{12}^1 PI_{t-1} + \Pi_{13}^1 OiREV_{t-1} + \Pi_{11}^2 RGDP_{t-2} + \Pi_{12}^2 PI_{t-2} + \Pi_{13}^2 OiREV_{t-2} + \cdots \\ & + \Pi_{11}^p RGDP_{t-p} + \Pi_{12}^p PI_{t-p} + \Pi_{13}^p OiREV_{t-p} + \Pi_{12}^0 PI_t + \Pi_{13}^0 OiREV_t \\ & + \varepsilon_{1t}. \quad 3 \end{aligned}$$

$$\begin{aligned} PI_t = {} & \Pi_{21}^1 RGDP_{t-1} + \Pi_{22}^1 PI_{t-1} + \Pi_{23}^1 OiREV_{t-1} + \Pi_{21}^2 RGDP_{t-2} + \Pi_{22}^2 PI_{t-2} + \Pi_{23}^2 OiREV_{t-2} + \cdots \\ & + \Pi_{21}^p RGDP_{t-p} + \Pi_{22}^p PI_{t-p} + \Pi_{23}^p OiREV_{t-p} + \Pi_{21}^0 RGDP_t + \Pi_{23}^0 OiREV_t \\ & + \varepsilon_{2t} \quad 4 \end{aligned}$$

$$\begin{aligned} OiREV_t = {} & \Pi_{31}^1 RGDP_{t-1} + \Pi_{32}^1 PI_{t-1} + \Pi_{33}^1 OiREV_{t-1} + \Pi_{31}^2 RGDP_{t-2} + \Pi_{32}^2 PI_{t-2} + \Pi_{33}^2 OiREV_{t-2} + \cdots \\ & + \Pi_{31}^p RGDP_{t-p} + \Pi_{32}^p PI_{t-p} + \Pi_{33}^p OiREV_{t-p} + \Pi_{31}^0 RGDP_t + \Pi_{32}^0 PI_t \\ & + \varepsilon_{3t} \quad . \quad 5 \end{aligned}$$

Equations 3.38, 3.39, and 3.40 are rearranged to obtain equations 3.41-3.43 as stated below.

$$\begin{aligned} & RGDP_t - \Pi_{12}^0 PI_t - \Pi_{13}^0 OiREV_t \\ & = \Pi_{11}^1 RGDP_{t-1} + \Pi_{12}^1 PI_{t-1} + \Pi_{13}^1 OiREV_{t-1} + \Pi_{11}^2 RGDP_{t-2} + \Pi_{12}^2 PI_{t-2} + \Pi_{13}^2 OiREV_{t-2} \\ & + \cdots + \Pi_{11}^p RGDP_{t-p} + \Pi_{12}^p PI_{t-p} + \Pi_{13}^p OiREV_{t-p} \\ & + \varepsilon_{1t} \quad 6 \end{aligned}$$

$$
\begin{aligned}
&-\Pi_{21}^{0}RGDP_t + PI_t - \Pi_{23}^{0}OiREV_t \\
&\quad = \Pi_{21}^{1}RGDP_{t-1} + \Pi_{22}^{1}PI_{t-1} + \Pi_{23}^{1}OiREV_{t-1} + \Pi_{21}^{2}RGDP_{t-2} + \Pi_{22}^{2}PI_{t-2} + \Pi_{23}^{2}OiREV \\
&\quad - \Pi_{31}^{0}RGDP_t - \Pi_{32}^{0}FPI_t + OiREV_t \\
&\quad = \Pi_{31}^{1}RGDP_{t-1} + \Pi_{32}^{1}PI_{t-1} + \Pi_{33}^{1}OiREV_{t-1} + \Pi_{31}^{2}RGDP_{t-2} + \Pi_{32}^{2}PI_{t-2} + \Pi_{33}^{2}OiREV_{t-2} \\
&\quad + \cdots + \Pi_{31}^{p}RGDP_{t-p} + \Pi_{32}^{p}PI_{t-p} + \Pi_{33}^{p}OiREV_{t-p} \\
&\quad + \varepsilon_{3t} \qquad 7
\end{aligned}
$$

The matrix form of the SVAR (p) model for the savings channel is given below.

$$
\begin{aligned}
&\begin{bmatrix} 1 & -\Pi_{12}^{0} & -\Pi_{13}^{0} \\ -\Pi_{21}^{0} & 1 & -\Pi_{23}^{0} \\ -\Pi_{31}^{0} & -\Pi_{32}^{0} & 1 \end{bmatrix} \begin{bmatrix} RGDP_t \\ PI_t \\ OiREV_t \end{bmatrix} \\
&\quad = \begin{bmatrix} \Pi_{11}^{1} & \Pi_{12}^{1} & \Pi_{13}^{1} \\ \Pi_{21}^{1} & \Pi_{22}^{1} & \Pi_{23}^{1} \\ \Pi_{31}^{1} & \Pi_{32}^{1} & \Pi_{33}^{1} \end{bmatrix} \begin{bmatrix} RGDP_{t-1} \\ PI_{t-1} \\ OiREV_{t-1} \end{bmatrix} + \begin{bmatrix} \Pi_{11}^{2} & \Pi_{12}^{2} & \Pi_{13}^{2} \\ \Pi_{21}^{2} & \Pi_{22}^{2} & \Pi_{23}^{2} \\ \Pi_{31}^{2} & \Pi_{32}^{2} & \Pi_{33}^{2} \end{bmatrix} \begin{bmatrix} RGDP_{t-2} \\ PI_{t-2} \\ OiREV_{t-2} \end{bmatrix} + \begin{bmatrix} \cdots \\ \cdots \\ \cdots \end{bmatrix} \\
&\quad + \begin{bmatrix} \Pi_{11}^{P} & \Pi_{12}^{p} & \Pi_{13}^{p} \\ \Pi_{21}^{p} & \Pi_{22}^{p} & \Pi_{23}^{p} \\ \Pi_{31}^{p} & \Pi_{32}^{p} & \Pi_{33}^{p} \end{bmatrix} \begin{bmatrix} RGDP_{t-p} \\ PI_{t-p} \\ OiREV_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \qquad 8
\end{aligned}
$$

Following the recursive approach, which is prominently applied in empirical literature,$-\Pi_{12}^{0}$,$-\Pi_{13}^{0}$ and $-\Pi_{23}^{0}$ will be restricted to zero for the SVAR(p) model to be identified. Thus, the recursive SVAR(p) model can be stated below;

$$
\begin{aligned}
RGDP_t &= \Pi_{11}^{1}RGDP_{t-1} + \Pi_{12}^{1}PI_{t-1} + \Pi_{13}^{1}OiREV_{t-1} + \Pi_{11}^{2}RGDP_{t-2} + \Pi_{12}^{2}PI_{t-2} + \Pi_{13}^{2}OiREV_{t-2} + \cdots \\
&\quad + \Pi_{11}^{p}RGDP_{t-p} + \Pi_{12}^{p}PI_{t-p} + \Pi_{13}^{p}OiREV_{t-p} \\
&\quad + \varepsilon_{1t} \qquad 9
\end{aligned}
$$

$$
\begin{aligned}
&-\Pi_{21}^{0}RGDP_t + PI_t \\
&\quad = \Pi_{21}^{1}RGDP_{t-1} + \Pi_{22}^{1}FPI_{t-1} + \Pi_{23}^{1}OiREV_{t-1} + \Pi_{21}^{2}RGDP_{t-2} + \Pi_{22}^{2}PI_{t-2} \\
&\quad + \Pi_{23}^{2}OiREV_{t-2} + \cdots + \Pi_{21}^{p}RGDP_{t-p} + \Pi_{22}^{p}PI_{t-p} + \Pi_{23}^{p}OiREV_{t-p} \\
&\quad + \varepsilon_{2t} \qquad 10 \\
&-\Pi_{31}^{0}RGDP_t - \Pi_{32}^{0}FPI_t + OiREV_t \\
&\quad = \Pi_{31}^{1}RGDP_{t-1} + \Pi_{32}^{1}FPI_{t-1} + \Pi_{33}^{1}OiREV_{t-1} + \Pi_{31}^{2}RGDP_{t-2} + \Pi_{32}^{2}FPI_{t-2} \\
&\quad + \Pi_{33}^{2}OiREV_{t-2} + \cdots + \Pi_{31}^{p}RGDP_{t-p} + \Pi_{32}^{p}PI_{t-p} + \Pi_{33}^{p}OiREV_{t-p} \\
&\quad + \varepsilon_{3t} \qquad 11
\end{aligned}
$$

In matrix form, the recursive model is expressed as:

$$
\begin{aligned}
&\begin{bmatrix} 1 & 0 & 0 \\ -\Pi_{21}^{0} & 1 & 0 \\ -\Pi_{31}^{0} & -\Pi_{32}^{0} & 1 \end{bmatrix} \begin{bmatrix} RGDP_t \\ PI_t \\ OiREV_t \end{bmatrix} \\
&\quad = \begin{bmatrix} \Pi_{11}^{1} & \Pi_{12}^{1} & \Pi_{13}^{1} \\ \Pi_{21}^{1} & \Pi_{22}^{1} & \Pi_{23}^{1} \\ \Pi_{31}^{1} & \Pi_{32}^{1} & \Pi_{33}^{1} \end{bmatrix} \begin{bmatrix} RGDP_{t-1} \\ PI_{t-1} \\ OiREV_{t-1} \end{bmatrix} + \begin{bmatrix} \Pi_{11}^{2} & \Pi_{12}^{2} & \Pi_{13}^{2} \\ \Pi_{21}^{2} & \Pi_{22}^{2} & \Pi_{23}^{2} \\ \Pi_{31}^{2} & \Pi_{32}^{2} & \Pi_{33}^{2} \end{bmatrix} \begin{bmatrix} RGDP_{t-2} \\ PI_{t-2} \\ OiREV_{t-2} \end{bmatrix} + \begin{bmatrix} \cdots \\ \cdots \\ \cdots \end{bmatrix} \\
&\quad + \begin{bmatrix} \Pi_{11}^{P} & \Pi_{12}^{p} & \Pi_{13}^{p} \\ \Pi_{21}^{p} & \Pi_{22}^{p} & \Pi_{23}^{p} \\ \Pi_{31}^{p} & \Pi_{32}^{p} & \Pi_{33}^{p} \end{bmatrix} \begin{bmatrix} RGDP_{t-p} \\ PI_{t-p} \\ OiREV_{t-p} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1t} \\ \varepsilon_{2t} \\ \varepsilon_{3t} \end{bmatrix} \qquad 12
\end{aligned}
$$

In order to prevent autocorrelations, spill-over shocks, and cross-error correlations, we set
$A_0 Y_t = \mathrm{B}U_t$ 13

Where Y is the matrix of endogenous variables, B is variance matrix, and U is the matrix of error terms. This can be presented in matrix form as follows;

$$\begin{bmatrix} 1 & 0 & 0 \\ -\Pi_{21}^0 & 1 & 0 \\ -\Pi_{31}^0 & -\Pi_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} RGDP_t \\ PI_t \\ OiREV_t \end{bmatrix} = \begin{bmatrix} \delta_1 & 0 & 0 \\ 0 & \delta_2 & 0 \\ 0 & 0 & \delta_3 \end{bmatrix} \begin{bmatrix} U_{1t} \\ U_{2t} \\ U_{2t} \end{bmatrix} \quad 14$$

This implies that
$A_0 E_t = \mathrm{B}U_t$ 15
where E represents the first impulses' matrix (i.e., initial shocks in the endogenous variables). As mentioned in equation 3.52, this can be written as a matrix.

$$\begin{bmatrix} 1 & 0 & 0 \\ -\Pi_{21}^0 & 1 & 0 \\ -\Pi_{31}^0 & -\Pi_{32}^0 & 1 \end{bmatrix} \begin{bmatrix} e_t^{RGDP} \\ e_t^{PI} \\ e_t^{OiREV} \end{bmatrix} = \begin{bmatrix} \delta_1 & 0 & 0 \\ 0 & \delta_2 & 0 \\ 0 & 0 & \delta_3 \end{bmatrix} \begin{bmatrix} U_{1t} \\ U_{2t} \\ U_{2t} \end{bmatrix} \quad 16$$

Consequently, to calculate beginning reactions, we can set
$E_t = A_0^{-1} \mathrm{B}U_t$ 17

That is; E = SU 18

Where S = A_0^{-1}B. This can be displayed as a matrix as follows:

$$\begin{bmatrix} e_t^{RGDPr} \\ e_t^{PI} \\ e_t^{OiREV} \end{bmatrix} = \begin{bmatrix} a & 0 & 0 \\ b & c & 0 \\ d & e & f \end{bmatrix} \begin{bmatrix} U_{1t} \\ U_{2t} \\ U_{3t} \end{bmatrix} \quad 19$$

Where; a = initial response of RGDP to own shock, b = initial response of PI to RGDP shock; c = initial response of PI to own shock; d = initial response of OIX to RGDP shock; e = initial response of OIX to PI shock; and f = initial response of OIX to own shock.

Method of Data Analysis

Data was examined utilizing econometric and descriptive statistical methods. The descriptive statistical tools consist of tables, graphs, percentages and averages (means). The econometric tools on the other hand includes the Unit Root tests for which the Augmented Dicker-fuller and Phillips-Perron (PP) tests were conducted. A structural vector autoregressive model (SVAR) was used for the analysis in this study. The necessary testing was done for other VAR framework tests such VAR lag selection criteria, impulse-response functions, prediction error variance decomposition, and residual diagnostic tests.

5 Empirical Results and Dissuasion

Unit root tests were run on each variable to determine the level of stationarity in the series prior to estimating the model. The Augmented Dicker-fuller (ADF) and Phillips-Perron (PP) unit roots were considered in this study to validate the stationary of the data.

Table 1: Results of the ADF Unit Root Test

Variables	At level	1% Critical Level	5% Critical Level	10% Critical Level	Order of Integration
Nigeria					
LRGDPND	-4.71822	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0003				
LPIN	-5.89465	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0000				
OIREVN	-4.02034	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0029				
UAE					
LRGDPND	-4.62391	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0004				
LPIN	-4.9249	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0002				
OIREVN	-4.37398	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0008				

Source: E-Views 10 Output Extracts

The ADF unit root results in Table 1 validate that every variable is stationary at level and 5% level of significance. This is as a result of their individual probability values being below the level's 0.05 critical levels. The Phillips-Perron unit root test was also conducted to confirm the stationarity of the variables.

Table 2: Results of the PP Unit Root Test

Variables	At level	1% Critical Level	5% Critical Level	10% Critical Level	Order of Integration
Nigeria					
LRGDPND	-4.71822	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0003				
LPIN	-5.89531	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0000				
OIREVN	-3.87362	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0043				
UAE					
LRGDPND	-4.64425	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0004				
LPIN	-4.97319	-3.57131	-2.92245	-2.59922	I(0)
Prob	0.0002				
OIREVN	-4.19455	-3.571310	-2.92245	-2.59922	I(0)
Prob	0.0013				

Source: E-Views 10 Output Extracts

Results of PP from Table 2, which demonstrate that the real GDP, portfolio investment, and oil revenue statistics are stationary at level (i.e., I(0)). This is due to the fact that for Nigeria the probability values of 0.0003, 0.0000, and 0.0043 are less than 5% threshold of significance, but for the UAE the probability values are 0.0004, 0.0002, and 0.0013. The models were examined to determine the optimal lag that could yield robust results.

Table 3: Optimal Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
Nigeria						
0	-126.689	NA	0.083612	6.032035	6.154910*	6.077347
1	-110.548	29.27848*	0.060078*	5.699909*	6.191407	5.881159*
2	-106.525	6.735954	0.076271	5.931404	6.791525	6.248590
3	-100.339	9.494842	0.088448	6.062286	7.291031	6.515409
UAE						
0	-113.163	NA	0.039420	5.280120	5.401769	5.325233
1	1.093300	207.7381*	0.000330*	0.495759*	0.982356*	0.676213*
2	8.001101	11.61767	0.000365	0.590859	1.442404	0.906653

Source: E-views 10 Output Extracts

The results presented in Table 3 show that lag one (1) is the optimal lag for the two models because it has the least AIC and HQ relative to the other lags except Schwarz information criterion for Nigeria Based on the selected criteria (AIC, and HQ) for this study, it implies that lag one is the optimal lag length the models for Nigeria and UAE.

Impact of Revenue from Oil on Portfolio Investment among Nigeria and UAE

The following is a presentation of the study's bivariate regression models used to evaluate the impact of oil revenue on the investment portfolios of Nigeria and the UAE:

Table 4: Result of the Impact of Oil Revenue on the Investment Portfolios of Nigeria and the UAE:

Variables	Coefficient	Std. Error	t-statistic
Nigeria			
OIREVN	0.000131	0.020088	0.006544
UAE			
OIREVN	0.001034	0.000609	1.697994

Source: Culled from E-views 10

Results from Table 4 show that portfolio investments in Nigeria and the United Arab Emirates are positively impacted by oil revenue. However, additional research indicates that the impact of oil revenue on portfolio investments in Nigeria and the UAE is not statistically significant at the 5% level of significance. However, at a 10% level of significance, the effect of oil revenue on portfolio investment in the UAE is statistically significant. This shows that, ceteris paribus, a 1% rise in oil revenue causes a 0.001034% increase in portfolio investment in the UAE. This shows that, in contrast to Nigeria, the UAE's economic growth is significantly influenced by oil money. The results also imply that the relative impact of oil revenue on portfolio investment in UAE is stronger in terms of significance and magnitude to that of Nigeria. The implication of this result is that Oil revenue can provide a source of diversification for a portfolio. When oil prices are high, the revenues generated can be used to invest in a variety of assets, such as stocks, bonds, real estate, and commodities. This diversification can help spread risk and potentially improve overall portfolio returns. The positive influence of oil revenue on portfolio investments in Nigeria and the United Arab Emirates is similar to empirical work of Okwori and Sule (2016) and is theoretical plausible

Transmission Effect of Oil Revenue to Economic Growth in Nigeria and UAE

The study uses SVAR statistics to show how oil revenue affects Nigeria and the UAE economic growth. Before examining the transmission effect of revenue from oil to growth of the economy, the study examines the residuals of the VAR estimated.

The study used the inverse roots of the AR features polynomial test to determine the outcomes of the model's stability test. Figure 5.2 and Figure 5.3 show the findings.

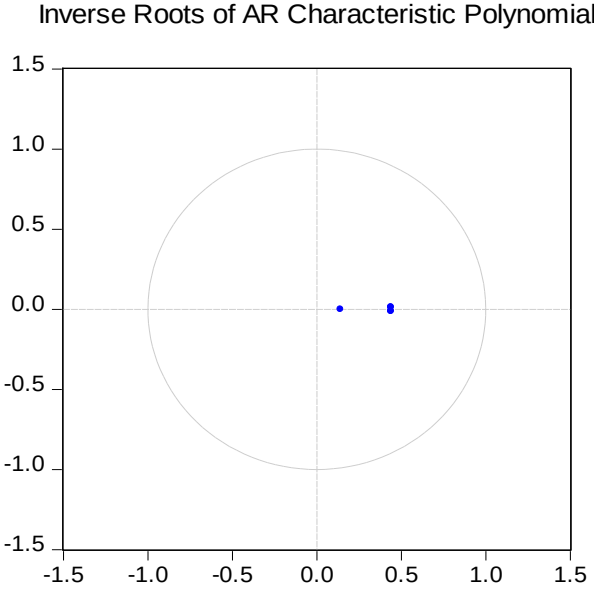


Figure 1: Stability Test Results (Nigeria)

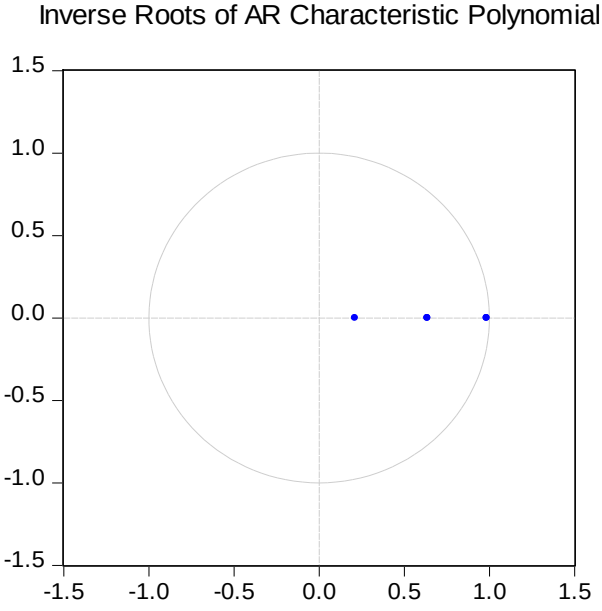


Figure 2: Stability Test Results (Nigeria)

Source: Extract from E-views 10 Output

The inverse roots of the characteristic AR polynomial from Figures 1 and 2 have modulus smaller than one and lie inside the unit circle, suggesting that the VAR estimations are stable. The interdependence of the residuals is examined using the VAR residual serial correlation test in the study. Table 5 provides the findings.

Table 5: VAR Residual Serial Correlation LM Tests Result for Nigeria

Lag	LRE* stat	Df	Prob.	Rao F-stat	df	Prob.
Nigeria						
1	9.842612	9	0.3634	1.108879	(9, 97.5)	0.3639
UAE						
1	13.68304	9	0.1341	1.571714	(9, 97.5)	0.1344

Source: Extract from E-views 10 Output

The VAR residual serial correlation LM test outcomes are shown in Table 5. They indicate that there are no incidences of serial correlation among the variables as all the probability values are greater than 0.05 at 5% level of significance. The implication is that the observations of the residuals are uncorrelated with each other.

To analyze whether the residuals' variance is unequal across a range of observed values, the study additionally evaluates the VAR residual heteroskedasticity test. The results are presented in Table 6.

Table 6: VAR Residual Heteroskedasticity Tests Result

Countries	Chi-sq	Df	Prob.
Nigeria	39.51278	36	0.3159
UAE	40.28153	36	0.2865

Source: Extract from E-views 10 Output

The results of the VAR residual heteroskedasticity tests in Table 6 reveal insignificant Chi-square of 39.51278 and 40.28153 for heteroscedasticity tests of the two models (Nigeria and UAE respectively). It is implied that there is no incidence of heteroscedasticity in the two models

Table 7: Contemporaneous Effects on Nigeria and UAE

	Nigeria				**UAE**		
	RGDP	**PIN**	**OIREVN**	**RGDP**	**PIN**	**OIREVN**	**RGDP**
RGDP	1	0	0	RGDP	1	0	0
PIN	2.276103	1	0	PIN	0.005983	1	0
OIREVN	67.65075	0.010007	1	OIREVN	46.09474	10.05493	1

Source: Extract from E-views 10 Output

Table 7 results show contemporaneous impacts result demonstrates that, while positive and not statistically significant at the 5% level of significance for both Nigeria and the UAE, portfolio investment has an immediate positive impact on economic development. This suggests that changes in

portfolio investment levels do not immediately affect economic growth in Nigeria and the United Arab Emirates. This means that the rate of economic growth in Nigeria and the UAE would not be significantly impacted by portfolio investments for some time. The results also demonstrate that the immediate effects of oil money on economic growth in both countries are positive and statistically significant, given that their probability values are smaller than 0.05 at the 5% threshold of significance in Nigeria and the UAE. This indicates that the two countries' incomes increased immediately and favourably as a result of oil money. Thus, the economic growth's immediate response to abrupt changes in portfolio investment is favourable but statistically inconsequential at the 5% level of significance. It suggests that although improvements in economic development may not happen right once as portfolio investment rises.

Impulse response of Economic Growth to Shocks in Nigeria and UAE

Figure 3 shows the outcome of Nigeria's economic growth's irrational reaction to a shock to portfolio investment.

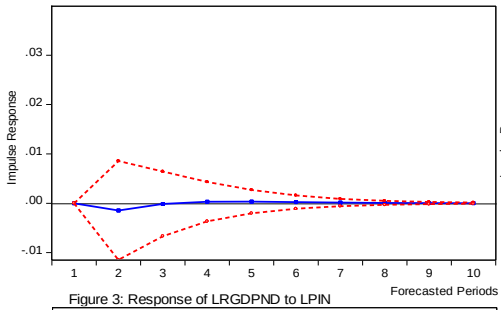
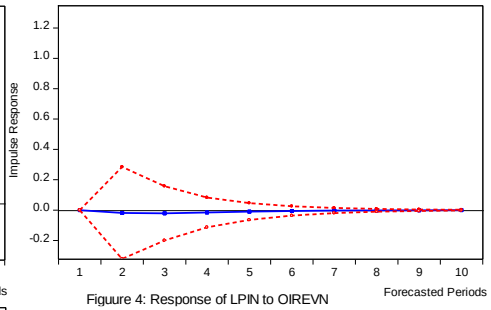


Figure 3: Response of LRGDPND to LPIN



Figuure 4: Response of LPIN to OIREVN

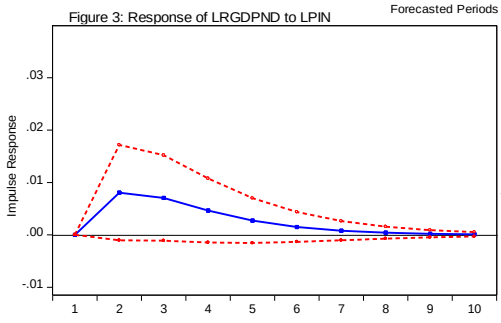


Figure 5: Response of LRGDPND to OIREVN

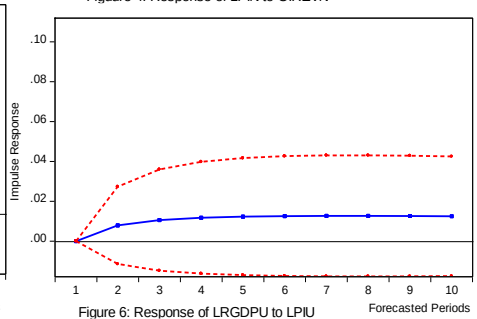


Figure 6: Response of LRGDPU to LPIU

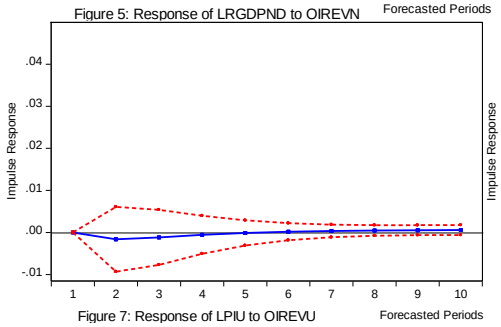


Figure 7: Response of LPIU to OIREVU

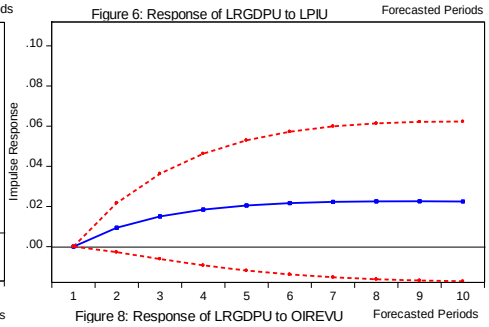


Figure 8: Response of LRGDPU to OIREVU

Figure 3 illustrates the impulse reaction of the Nigerian economy to a shock in portfolio investment over a ten-quarter forecast period. It is clear that the economy would respond negatively in the second period but quickly converge to zero in the medium and long terms. Given the current trajectory, portfolio investment levels in Nigeria are not expected to have a substantial impact on economic growth, based on the economy's weak and small reaction to portfolio investment. This demonstrates that a shock to an investment portfolio won't have a negative long-term effect on

Nigeria's economic development. The impulse response result of portfolio investment to shock in oil revenue in Nigeria is presented in Figure 4. From Figure 4, a one standard deviation shock in oil revenue would cause portfolio investment to respond with a slight decline in the second quarter and maintain a constant the negative response to the fifth quarter. The implication is that a one standard deviation shock in oil revenue would cause portfolio investment to react negatively in the second quarter and maintain a somewhat similar response up onto the fifth quarter. After fifth quarter, a one standard deviation shock in oil revenue would not cause portfolio investment to respond significantly as its response turns infinitesimally to zero in the long-run. The implication is that there is weak response of portfolio investment to shock in oil revenue in Nigeria. Figure 5 shows the outcome of Nigeria's economy's irrational reaction to a shock in oil earnings.

According to Figure 5, a one standard deviation shock to oil revenue would result in a strong short-term response in economic growth, but the positive response would eventually fall to zero in the ninth quarter. The consequence is that although oil revenue may boost to growth in the near run by improving income, a lack of investment in either goods or portfolios in long term may slow down growth. This means that given the level of investment in the country especially portfolio investment, a one standard deviation shock in oil revenue would not cause portfolio investment to respond in the long-run significantly. Figure 6 shows the outcome of the UAE's economy's impulse reaction to a shock to portfolio investment. Figure 6 shows that an increase in portfolio investment of one standard deviation would result in positive economic development in the UAE for the whole projected period. The implication is that portfolio investment may contribute to very stable positive growth in the short-run and in the long-run in UAE. A one standard deviation shock to oil revenue as shown in Figure 7 would cause portfolio investment in UAE to respond with a slight decline in the second quarter and maintain a constant the negative response to the fourth quarter. The implication is that a one standard deviation shock in oil revenue would cause portfolio investment to react negatively in the second quarter and maintain a somewhat similar response up to the fourth quarter. In the fifth quarter, a one standard deviation shock in oil revenue would cause zero response of portfolio investment in UAE until the eighth forecast quarter when the response becomes slightly positive in the long-run. The implication is that there is weak response of portfolio investment to shock in oil revenue in UAE.

Figure 8 shows the response to economic expansion to the shock in oil revenue in the UAE throughout the following 10-quarter forecast period. It shows that a one standard deviation shock in oil revenue would cause economic growth to respond positively and significantly in the short-run. The response of economic growth in UAE has maintained a positive response to a shock in portfolio investment in the country. The implication is that oil revenue contributes to growth in the short-run in terms of income improvement, and due to portfolio investment using the oil proceeds, it also yields long-run economic growth in the UAE.

Accumulated Forecast Error Variance of Economic Growth to Shocks

The result of the accumulated forecast error variance of economic growth to shocks in portfolio investment and oil revenue in Nigeria and UAE are presented in Table 8.

Table 8: Result of the Forecast Error Variance for Nigeria and UAE

	Nigeria			UAE		
Period	LRGDPND	LPIN	OIREVN	LRGDPND	LPIN	OIREVN
Initial (1st year)	100	0.0000	0.0000	100	0.0000	0.0000
Short- term (3rd year)	92.05598	0.143199	7.800821	96.7812	1.148162	2.070635
Middle-term (5th year)	90.32798	0.153728	9.518295	94.45353	1.672755	3.873713
Long-term (10th year)	90.14156	0.158913	9.699522	91.82794	2.132764	6.039294
Decision	Decrease	Increase	Increase	Decrease	Increase	Increase

Source: E-views 10 Output Extract

The cumulative forecast error of economic growth to own shock would result in 100% in the start period, 92.06% in the short term (3rd year), 90.33% in the medium term (5th year), and 90.14% in the long run (10th year). According to this finding, Nigeria's economic growth would gradually become less variable as a result of its own shock. The results in Table 8 also reveal that innovation in portfolio investment and oil revenue explains about 0.14% and 7.80% respectively of the accumulated forecast error variance of economic growth in Nigeria in the short-term from zero variations at the initial period respectively. While the accumulated forecast error variance of economic growth owing to innovation in portfolio investment and oil revenue are 0.16% and 9.69% in the long-term, respectively. Similarly, it explains between 0.15 and 9.52 percent of the economic growth attributed to shocks to portfolio investment over the medium run. This signifies that variations in economic growth due to shock in portfolio investment and oil revenue in Nigeria would increase overtime.

Correspondingly, the accumulated forecast error of economic growth to own shock would account for 100% at the initial period, 96.78% in the short-term, 94.45% in the medium-term and 91.83% in the long-term. This result implies that variation in economic growth in UAE due to own shock would decline overtime. Innovations in portfolio investment and oil revenue would account for 1.15% and 2.07% of accumulated forecast error variance of economic growth in the short-term period, 1.67% and 3.87% of the accumulated forecast error variance of economic growth in the medium-term, and 2.13% and 6.04% of the accumulated forecast error variance of economic growth in the long-term respectively. This suggests that changes in economic growth may occur due to innovations in portfolio investment and oil revenue in UAE would increase overtime.

6 Conclusion/ Recommendations

In line with the study's findings, the study finds that oil revenue has little impact on portfolio investment in Nigeria and the United Arab Emirates. The study also comes to the conclusion that there is a positive but ineffective transmission linking oil revenue to economic growth in Nigeria and UAE through portfolio investment but with a relatively higher influence in UAE than that of Nigeria.

Based on the findings, the study recommended that there is a need for various governments to double their efforts at improving the investment climate in the portfolio using proceeds from oil sales like the UAE to achieve sustained economic growth. Reducing the direct and indirect costs of doing business in the countries is necessary to improve the investment climate, with transportation and energy costs at the top of the list of significant barriers. Diversification of the economy will enable the two economies to cushion the consequences of shocks within the capital market and country risk lessening. Reduced country risk will make the economy more enticing for foreign portfolio investment in the secondary and tertiary sectors.

The monetary authorities should operate a complete exchange liberalization which can encourage foreign investment in investing in the countries, especially in Nigeria and may allow returns on their investment unlike fixed rate of exchange which discourages investors.

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