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THE IMPACT OF OIL PRICE SHOCKS ON ECONOMIC GROWTH (A CASE STUDY; SELECTED SIX OPEC COUNTRIES) DURING THE PERIOD (1995-2014) PANEL-DATA MODELS

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IN

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By

KHALID RASHEED KHALID

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Supervisor

Assoc. Prof. Dr. Atilla. Ahmet UĞUR

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The masters Thesis, titled The impact of some macroeconomic variables on FDI inflows in the selected countries, written by Alan Nazar Ahmed, graduate student in the Economic Postgraduate Program, was accepted by the members of the jury listed below on .....

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DECLARATION

I solemnly declare that this dissertation titled "The Impact of Oil Price Shocks on Economic Growth" (A Case Study; Selected Six OPEC Countries) during the period 1995-2014 submitted to the Department of Economics was done by me and has never been presented partially or entirely to any university for the award of academic qualification or otherwise, rather than for which it is now presented.

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ABSTRACT

THE IMPACT OF OIL PRICE SHOCKS ON ECONOMIC GROWTH (A CASE STUDY; SELECTED SIX OPEC COUNTRIES) DURING THE PERIOD (1995-2014) PANEL-DATA MODELS

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This paper examines the impact of oil price shocks on economic growth in selected six OPEC countries. In this regard, we extracted the Petroleum Exporting Countries Data. Variables of the model are GDP, oil price, government expenditure, foreign direct investment, inflation, exports and imports. An annual data for the period 1995 to 2014, for six OPEC countries, including Iraq, Iran, Saudi Arabia, Kuwait, Algeria and Nigeria have been collected. The study uses Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests to establish Stationarity of the Panel Data models. Ordinary Least-Square (OLS), Fixed-Effects Model (FEM) And Random-Effects Model (REM) were used to find out Impact of Oil Price on GDP. To choose between Fixed-Effects Model and Random-Effects Model the Hausman test was applied because it has an asymptotic chi-square distribution. The results of Hausman test indicated that the Random Effect Model was the most appropriate model for the study. The empirical results of the study indicated positive and a significant impact of oil price shocks on economic growth (GDP) of selected six OPEC countries.

Key Words: Oil price shocks, OPEC Countries, GDP, Panel-Data Models and Unit Root Test**.**

ÖZET

PETROL ŞOKLARININ EKONOMIK BÜYÜME ÜZERINE ETKILERI (SEÇILMIŞ ALTI OPEC ÜLKESI ÜZERINE) ÇALIŞMASI (1995-2014) PANEL VERI

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Bu yazıda, seçilen altı OPEC ülkesinde petrol fiyat şoklarının ekonomik büyüme üzerindeki etkisi incelenmektedir. Bu bağlamda Petrol İhraç Eden Ülkeler Verilerini çıkardık. Modelin değişkenleri GSYİH, petrol fiyatı, devlet harcamaları, doğrudan yabancı yatırım, enflasyon, ihracat ve ithalattır. Irak, İran, Suudi Arabistan, Kuveyt, Cezayir ve Nijerya olmak üzere altı OPEC ülkesi için 1995-2014 dönemi yıllık verileri toplandı. Çalışma, panel veri modelinin İstikrarını sağlamak için Artırılmış Dickey-Fuller (ADF) ve Phillips-Perron (PP) birim kök testlerini kullanmaktadır. Petrol Fiyatlarının GSYİH Üzerindeki Etkisini Belirlemek İçin Sıradan En Küçük Kareler (OLS), Sabit Efekt Modeli (FEM) ve Rastgele Efekt Modeli (REM) kullanılmıştır. Sabit Efekt Modeli ile Rastgele Efekt Modeli arasında seçim yapmak için asimtotik ki-kare dağılımına sahip olduğu için Hausman testi uygulanmıştır. Hausman testinin sonuçları, Random Effect Modeli'nin çalışma için en uygun model olduğunu belirtti. Çalışmanın ampirik sonuçları seçilen altı OPEC ülkesinin petrol fiyat şoklarının ekonomik büyüme (GSYİH) üzerinde olumlu ve önemli bir etkiye işaret etmiştir.

Anahtar Kelimeler: Petrol fiyat şokları, OPEC Ülkeleri, GSYİH, Panel Verileri ve Birim Kök.

DEDICATION

This Thesis is first and foremost dedicated to Almighty Allah (SWT), for His Blessings and Mercies bestowed upon me to successfully complete this program through the face of uncertainties and without any hindrance. It was also dedicated to: the lovely messenger of Allah (Prophet Muhammad), peace and blessing be upon him, His family, His companion and those who follows his teaching up to the day of resurrection. Also, to my loving and wonderful parents, my life and the backbone of my success. Thank you so much for all the sacrifices, prayers and support given throughout my life, may Allah reward you with Jannatul Firdausi, Ameen. Finally, to all members of my family, particularly to Kajeen Sabah Sabri.

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Unlimited thanks to my lovely and dearest my parents for care and their love, affection, prayers, guidance, endurance, consistent prayers and support given to me right from my childhood life. That have seen so many harsh times me through all my life to make me a successful person in life may Allah reward them with Jannatul Firdausi, Ameen.

I'd like to present my sincere thankfulness the one who wanted to see me right now… my dear deceased Dalin Sabah Sabri, who died in 26/2/2015 may God rest his soul in peace. For her great role in my life, her numerous sacrifices for me, support, for being truly my friend when needed and tried the best of her ability to impart knowledge and skills to me while she is alive. May her gentle soul rest in perfect peace and may he reward with Aljannatul Firdausi, Ameen.

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LIST OF ABBREVIATIONS AND SYMBOLS

OPEC	Organization of Petroleum Exporting Countries
GARCH	Generalized Autoregressive Conditional Heteroscedasticity
CPI	Consumer Price Index
SVAR	Structural Vector Autoregressive
VECM	Vector Error Correction model
EIA	Energy Information Administration
VAR	Vector Autoregressive
WTI	West Texas Intermediate
IMF	International Monetary Fund
GDP	Gross Domestic Product
MENA	Middle Eastern and North African
WDI	World Development Indicators
ADF	Augmented Dickey Fuller
PP	Phillips-Perron
OLS	Ordinary Least-Square
PM	Pooled Model
FEM	Fixed-Effects Model
REM	Random-Effects Model
LM	Lagrange Multiplier
OP	Oil Price
GE	Government Expenditure
FDI	Foreign Direct Investment
IN	Inflation
X	Exports
I	Imports
Ɛ	Error Term
CDs	Cross-sectional dependence
GMM	General Method Of Moments

CHAPTER ONE

1. INTRODUCTION

The oil price shock of the economists was considered because of the large impact on macroeconomic variables. The world economy has witnessed various negative and positive changes in the oil price. These changes and fluctuations in world oil prices have impacted on the macroeconomic variables and seriously it has been challenged the economic cases of these countries and has forced them to think of alternatives in order to feel secure about the adverse impacts (Negative impacts) of such shocks so that the oil-exporting countries which are prone (highly vulnerable) to negative shocks to oil prices, have established the institutions for saving the excess foreign exchange revenues from sales of crude Petroleum at high prices to make use it in the time of incidence of the adverse shocks to Petroleum prices for their own purposes. A high upward trend in the global price of crude oil in recent years, which rose to a record of nominal higher price of US $147 in the mid-2008, has become a major source of concern among economist and policy makers in oil exporting countries and world at large, especially its implication on the macroeconomic performance. oil prices have risen since mid-1999, and continued improvement in oil prices in terms of oil prices exceeded $147 a barrel in mid-2008, but due to financial crisis December 2008 decreased demand for oil, which affected the oil prices during this financial crisis.

The oil exporting country economy heavily relied on crude oil proceed as the main source of foreign exchange earnings and revenue as well, In Iraq 99% of its total export earnings depends on oil and it contribute for about 90% of the entire government revenue, also oil contributes significant proportion of Gross Domestic Product in Iraq, its contribution to GDP stood at 43% to50%. In Iran 80% of its total export earnings depends on oil and it contribute for about 50to60% of the entire government revenue, also oil contributes significant proportion of Gross Domestic Product in Iran, its contribution to GDP stood at 17%. In Saudi Arabia 90% of its total export earnings depends on oil and it contribute for about 80% of the entire government revenue, also oil contributes significant proportion of Gross

Domestic Product in Saudi Arabia, its contribution to GDP stood at 45%. In Kuwait 97% of its total export earnings depends on oil and it contribute for about 60% of the entire government revenue, also oil contributes significant proportion of Gross Domestic Product in Kuwait, its contribution to GDP stood at 60%. In Algeria 97% of its total export earnings depends on oil and it contribute for about 60% of the entire government revenue, also oil contributes significant proportion of Gross Domestic Product in Algeria, its contribution to GDP stood at 60%. In Nigeria 95% of its total export earnings depends on oil and it contribute for about 85% of the entire government revenue, also oil contributes significant proportion of Gross Domestic Product in Nigeria, its contribution to GDP stood at 20%.

Budgetary allocations are mainly based upon oil price projection, so any increase in the oil price will leads to a surplus budget and a drop in the oil price will leads to budget deficit in oil exporting countries. Statistically, Iraq the country's oil reserve is projected to be around 142.5 billion barrels, efficient daily oil production capacity is 3.6 million barrels; Iran the country's oil reserve is projected to be around 158.4 billion barrels, efficient daily oil production capacity is 4.2 million barrels; Saudi Arabia the country's oil reserve is projected to be around 266.46 billion barrels, efficient daily oil production capacity is 11.6 million barrels; Kuwait the country's oil reserve is projected to be around 101.5 billion barrels, efficient daily oil production capacity is 2.7 million barrels; Algeria the country's oil reserve is projected to be around 12.2 billion barrels, efficient daily oil production capacity is 1.2 million barrels; Nigerian the country's oil reserve is projected to be around 37.06 billion barrels, efficient daily oil production capacity is 2.8 million barrels Energy Information Administration; OPEC annual statistical bulletin at end (2015). Persistent conflicts in the oil producing region of some oil exporting countries has left the country with a huge gap between real output and the OPEC quota allocated to it, this is due to attacks on oil facilities, kidnapping of foreign employees of the oil companies and disruption in production.

1.1. Statement of the Problem

Oil prices have been many changes and instability in prices, where it was known oil shocks. The first of these shocks has shown the October 1973 war, where the price rose The official Arab crude of about $3 per barrel to around $11.65 a barrel on average for the year 1974,and continued these prices so, even saw a strong jump after the Islamic revolution in Iran in 1979, when pumping Iran's oil exports stop, then the outbreak of the Iran-Iraq war in September 1980, where the official price of Arab Light crude reached 17.25 dollars per barrel on average for the year 1979 then the price jumped to $28.64 a barrel on average for 1980, and then to $32.51 a barrel average of, 1981 And this is what is known as the second oil shock, The third shock of petroleum during the invasion of Iraq, Kuwait, where the price of oil rose from an average of $17.31 for the year In 1989 to $22.26 on average for the year,1990 and continued volatility in oil prices until the prices collapsed Oil in 1998 scored an average barrel of oil around $69.9 a series of OPEC crudes as a result conflict in the producing countries and the decline in global demand for oil market shares during the financial crisis that devastated the economies of South Asia.

The continue fluctuation in the oil price remain a source of concern to economists and policy makers over the world. Since the major shock of 1974, there have been several fluctuations in the oil price. In the year 2002, there was an increase of about 50 percent in the price of crude oil making it to be $26 at the end of the year from initial price of $17 at the beginning of the year, the price jump to $53 in the late 2004; a historical recorded nominal higher price of $147 in the mid 2008;But due to the financial crisis in December 2008 decreased demand for oil, which affected the oil prices during this financial crisis, followed by a dramatic sharp drop of the price to $28 by the end of 2015. However, the oil price recorded an increase in its price since the beginning of 2016; oil price was $51 per barrel as at mid-2016, currently, its $57 as at December 2016.

1.2. Objectives of the Study

Generally, the aim of this study is to examine the impact of oil price shocks on the economic growth of six oil-exporting (OPEC) selected countries; in order to accomplish this, the following specific objectives are stated:

- To investigates the impact of oil price shocks on the economic growth of the selected countries.
- To identify the channels through which the impacts is transmitted to the economy of the selected countries.
- To Estimate the relationship between flows economic growth and macroeconomic indicators in selected countries.

1.3. Scope of the Study

This work focuses on the implication of oil price changes on the six selected oil exporting countries; it covers the period 1995-2014 and it was based on the economic growth performance of oil exporting countries during the period under review.

1.4. Research Questions

1. What are impacts of oil price shocks on the economic growth?
2. Does a fluctuation in oil price affect the economy of Oil-Exporting Countries?
3. To what extent do oil price shocks affect GDP of the selected OPEC countries?

1.5. Research Hypothesis

Considering the above research questions, the researcher developed the following hypothesis to be tested in this study:

H0: Fluctuations in the oil price has no impact on the GDP of the selected countries.

H1: Fluctuations in the oil price has impact on the GDP of the selected countries.

H0: macroeconomics variables such as Government Expenditure, Foreign Direct Investment, Exports, Imports and Inflation, have a negative and not significant impact on GDP.

H1: macroeconomics variables such as Government Expenditure, Foreign Direct Investment, Exports, Imports and Inflation, have a positive and significant impact on GDP.

H0: Residuals across countries are not correlated.

H1: Residuals across countries are correlated.

1.6. Contribution of Research

This study seeks to contribute to the existing literature by using Panel Data Analysis, data obtained from six countries during the period 1995 to 2014 which was not analyzed in the previous studies in my country according to my knowledge. Particularly the global economy passed in this period over the important stages of economic transformations, such as fluctuations in oil prices on a global scale with significant gaps and unexpected shocks due to international conflicts over oil resources to satisfy its oil needs. This study focused on finding a causal relationship between the explanatory variables that include oil price shocks and dependent variable GDP. In this study, we are trying to show the positive aspects interested in the terms of reference in order to benefit from the introduction of the Positive. Despite the existence of studies-like, but this study is different from the previous one that the selected countries in this study, which includes all of Iraq, Saudi Arabia, Nigeria, Algeria, Iran and Kuwait, which have significant impacts on global supply and demand in terms of the amount of production, which control also the volatility of the oil prices World.

1.7. Historical Background of Oil Price

1.7.1. Introduction

This chapter historical oil price shocks; this chapter consists of three parts: first determinants of oil price shocks, second historical experience with oil shock; third Organization of Petroleum Exporting Countries (OPEC).

1.7.2. Determinants of Oil Price Shocks

Oil shocks simply means the fluctuations in the global price of crude oil in response to the shifts in the demand or supply in the market (Hamilton, 1983, and Wake ford, 2006). Historically there have been three eras with regards to setting the price of crude oil in the international market (Nkomo, 2006). Initially, multinational oil companies were the only determinants of the oil prices prior to the 1970s, after that period, the Organization of Petroleum Exporting Countries (OPEC) started influencing the oil price through its supply quota output decisions. By the late 1980s, however, world oil prices have always been determining by a market-related pricing system which links oil prices to the market price of a particular reference crude (Farrell, 2001). Two major ways of pricing oil are, Brent and West Texas Intermediate (WTI), are traded on the London and New York futures exchanges, respectively.

Demand and supply balance are the major forces that determined the price of oil in the international market; each one of these market forces is also influenced by many factors. Over the time, the demand for oil is derived mostly by the rates of economic growth in the major regions of the world, as well as changes or new innovations in the technology that depend on the energy to operate, such as efficiency gains or new found uses for oil. Nevertheless, such structural determinants tend not to change rapidly and are therefore very unlikely to provide a basis for an oil price shocks on their own. In addition to this, China's extraordinary economic growth has significantly affected demand for oil in the world. In opposite, a weak demand, such as the aftermath of the financial crisis in Asia in 1997, can have a distressing impact on the global oil prices in the short run.

OPEC and their counterpart of non-OPEC members are the suppliers in the crude oil market; their output normally depends on political and sometimes economic factors (Farrell, 2001). In the long run, the supply of oil usually is determined by the level of extraction, reserves, exhausted and new findings of oil, as well as efficient extractive technologies which lead to enhanced oil recovery. While in the short run, changes in OPEC production quotas plus the temporary disruptions of

supply due to some reasons like technical fault or political factors such as war and militancy in the oil-rich region of Iraq and Niger-delta (in the case of Nigeria), international sanctions to oil producing country (like in the case of Iran and Iraq) or the occurrence of natural disasters can have major implication for supply and in turn affect the oil prices.

1.7.3. Historical Experience with Oil Shocks

1.7.3.1. The First Oil Shock, 1973 – 74

The oil crisis of 1973 or the first oil shock began on October 15, 1973, was derived by the Arab-Israeli war, during which Arab oil producing countries placed an embargo on oil export to the United States and the Netherlands in particular, where the Netherlands has provided Israel with arms and allowed the Americans using Netherlands airports to provide and support of Israel. The United State of America, the Netherland and some others countries, to declare an oil embargo to pay for Western countries to force Israel to withdraw from Arab land occupied in the 1967 war, because they were perceived as being a strong ally of Israel. This coincides with the time that OPEC started influencing the global oil market by reducing the volumes of the output and unilaterally increasing the price. The price of oil skyrocketed from $3 a barrel to almost $11.65 per barrel in 1974 on a global scale. This had serious consequences to many advanced countries, including high inflation, which leads to a wage-price increase and thus, recession (Ilie, 2006).

1.7.3.2. The Second Oil Shock, 1979 – 80

The oil crisis in 1979 and the second oil crisis) in the United States occurred in the wake of the Iranian revolution, amid massive protests, the protests led to destroy Iran's oil sector, while the new system Resume oil exports, but it was less the size, prompting prices to increase, Saudi Arabia and other countries in OPEC had increased production to compensate for the decline, the overall loss in production was about 4%. However, the widespread panic resulted in the payment of the price much higher than is expected to be under normal circumstances. Price controls in the United States on domestic sources of oil also exacerbated the

situation. In 1980, in the aftermath of the Iraqi invasion of Iran, oil production almost stopped in Iran, and Iraq's oil production also fell sharply. After 1980, oil prices headed for a period of six years to decline, which reached its peak, down 46% from its price in 1986, due to lower demand and overproduction. The second oil shock was as caused by the Revolution of 1978/79 in Iran, followed by the Iraq and Iran war of the 1980s, which halted the Iranian oil export almost. Like what happened in the past oil shock, the enormity of the price increase was mostly caused by panic and hoarding attitude; at this time the role of the OPEC in the rise of price is not significant. This shock leads to another round of serious inflation globally, and many country's central banks like the US Federal Reserve Bank increased interest rates sharply in response (Suleiman, 2013).

1.7.3.3. The Third Oil Shock, 1990

The invasion of Kuwait by the Iraq in the August of 1990 resulted in the third oil crisis. The imposition of United Nation sanction against Iraq, which happens to be among the largest producer of oil in the world, plus the fear driving stockpiling, caused the price of the barrel of oil to rise from U.S. $17 in July 1990 to a high record of $35 in October of the same year. Nevertheless, as coalition forces that the US-led military success against the Iraqi forces has seen, concerns about supply shortages in the long term have fallen and prices began to fall. The shock does not last longer with the price decline to $20 per barrel in February 1991. This was as a result of huge deployment of the military by US and its allies, and subsequent victory; this brings a level of confidence, certainty, and stability in the global oil market. Some major industrialized economies have not suffered a major recession during this period, which was worsened by but not mainly entirely due to the oil spike (Sarb, 1991).

1.7.3.4. The Fourth Oil Shock, 2003 – 2006

The 2003 - 2006 oil shock was as a result of supply and demand factor in the oil market, there was a sharp rise in the demand for oil as a result of the rapid economic growth of developing economies like India and China, in addition to strong US economy. Disruption of supply in some part of oil producing states like the second invasion of Iraq, activities of militant in the oil-rich region of Niger Delta in Nigeria and Israel-Hezbollah war of 2006, the devastation brought by Hurricanes Katrina and Rita in the Gulf of Mexico, exert fears among the oil market players globally, this caused the price of oil increase from U.S. $25 in 2003 to record of $78 per barrel in mid-2006 (Wakeford, 2006).

1.7.3.5. The Current Oil Shock

The current oil shock which started in 2014 is largely attributed to oversupply and reduction in demand. From the supply side the problem started in late November 2014, OPEC declared that it would not reduce its production quota despite the increase in the oil production by non-OPEC nations, this leads to an oversupply of almost 1.4 million barrel per day, this is coming when Us shale oil exploration almost doubled up within the period. Saudi Arabian, Algerian and Nigerian oil, which were demanded by the US, started competing for the Asian market which necessitated the producers to reduce the price in order to catch their own share of the market. Iraq and Libya started exporting their oil plus the Iran nuclear deals which led to the lifting of the oil export embargo.

From the demand side, the economies of most of the European countries was staggering from the euro-zone crisis, the economies of developing countries were very weak, vehicles are becoming more energy efficient, so the demand of the oil was very low. The aforementioned problem leads to one of the most dramatic declines in the history of oil price (Baumeister and Kilian, 2015).

Figure 1. Annual nominal prices for OPEC crude oil from 1960 to 2014 (in U.S. dollars per barrel)

Source1: Researcher work dependent on the outputs of Eviews.8.2 program.

Source2: Data from (OPEC, 2016).

1.7.4. Organization of Petroleum Exporting Countries (OPEC)

It is a global organization with fourteen countries dependent on oil exports heavily to achieve their income, considered among the oil exporting countries leading in the world. The Member States have in this organization 43% of the world's oil production and 81% of the world's oil reserves. Was founded in Baghdad in 1960 the organization founded by Saudi Arabia, Iran, Iraq, Kuwait and Venezuela, based in Vienna. And today it also comprises nine others countries Algeria, Angola, United Arab Emirates, Ecuador, Indonesia, Libya, Nigeria, Qatar, Gabon, and Venezuela (OPEC, 2016). Additionally, OPEC states that 60% of the exported oil in the world comes from OPEC's member countries. This considerable market share entails that they are able to influence the direction of international crude oil prices through the policies that they set (Kaufmann et al., 2004). For example, the oil production in Saudi Arabia particularly affects the world oil price since the country is the largest producer within OPEC.

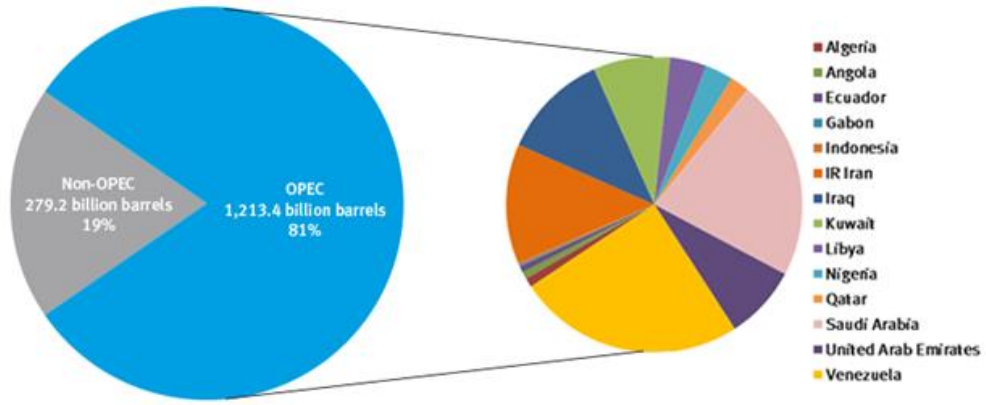
OPEC is considered to be an oil cartel even though its primary aim is to create a more stable oil market for both consumers and producers. This is accomplished by trying to avoid price fluctuations on the market by controlling a substantial share of the total supply of crude oil (Dunsby et al., 2008). Table 2.2.1 below presents the summary of OPEC members.

Table 1. Current OPEC Member Countries

S.No	Country	Region	Membership Years
1	Iraq	Middle East	1960 –
2	Iran	Middle East	1960 –
3	Kuwait	Middle East	1960 –
4	Saudi Arabia	Middle East	1960 –
5	Nigeria	Africa	1971 –
6	Algeria	Africa	1969 –
7	Libya	Africa	1962 –
8	Angola	Africa	2007 –
9	Qatar	Middle East	1961 –
10	United Arab Emirates	Middle East	1967 –
11	Indonesia	Southeast Asia	1962 – 2008, 2016 –
12	Ecuador	South America	1973 – 1992, 2007 –
13	Gabon	Africa	1962 – 2008, 2016 –
14	Venezuela	South America	1960 –

Source: Prepared by the researcher.

Figure 2. OPEC Share of World Crude Oil Reserves, 2015



OPEC proven crude oil reserves , at end 2015 *(billion barrels, OPEC share)*

Venezuela	300.88	24.8%	Kuwait	101.50	8.4%	Qatar	25.24	2.1%	Indonesia	3.23	0.3%
Saudi Arabia	266.46	22.0%	United Arab Emirates	97.80	8.1%	Algeria	12.20	1.0%	Gabon	2.00	0.2%
IR Iran	158.40	13.1%	Libya	48.36	4.0%	Angola	9.52	0.8%			
Iraq	142.50	11.7%	Nigeria	37.06	3.1%	Ecuador	8.27	0.7%			

Source: OPEC Annual Statistical Bulletin 2016.

CHAPTER TWO
LITERATURE REVIEW

2.1. Introduction

In this chapter, review a number of empirical works, scholarly articles, books; journals and studies that focus on the implication of oil price shocks on economic activity. This chapter consists of two parts: Theoretical Framework and Empirical Framework, the theoretical framework gives an insight of how oil price fluctuations affect economic activity. The essence is to update literature so as to gives required policies recommendations, while the empirical framework examined researches conducted by different researchers; methods or techniques used, and the findings.

2.2. Theoretical Framework

Theoretically, higher oil price necessitates the transfer of income from the oil importing to the oil exporting countries. The extent of the direct effect of increase in oil price largely depends on the share of oil on national income, whether the final users will be able to switch to the alternative source or they can be able to reduce their consumption, it also depends on how much the price of Gas rises because of a rise in the oil price, the gas intensity of the economy and the impact of higher price of other alternative energy sources that compete with, in the case electricity are generated from the gas, the bigger the increase in the price of oil, the bigger the macroeconomic implication (Majidi, 2006). In net oil importing countries, higher oil price leads to inflation because of an increase in the cost of production, decline in the demand for oil and lower investment. Revenues from taxes decreased, budget deficit increased due to fluctuation in government expenditure, which in turn lead to a rise in the interest rate. Also considering the resistance to real wages, an oil price increase automatically leads to upward pressure on nominal wage levels, there by invigorating wages pressure with very likely reaching implications that manifests, possibly in all the transmission channels. Likewise, in the net oil exporting countries, a rise in the price of oil will

increases national income through higher revenue from export, though part of this earnings would very much likely be offset later by losses as a result of lower demand for export more especially due to the economic recession suffered by the trading partners.

Over the years, a large number of researches study the impact of oil price shocks on output and suggest that oil price fluctuations have the potentiality to cause a positive effect on GDP growth of the oil exporting countries and a negative effect on net oil importing countries. Some empirical studies found a linear negative relationship between oil price and real activity in oil producing nations, while results from studies done in the mid-1980s suggest reversal of initial outcomes in light of the declines in oil prices that happened during the period of 1980s. Hamilton (1983, 1985) is one of the early economists to inveigle the economist and policy makers as well, that increase in oil price generally not just the OPEC supply problems of the 1970s, are the most important factor that contributes to the recession. In fact, the oil crisis of the 1970s and 1980s led to an increase in inflation and unemployment at the same period (Bruno and Sachs, 1985, Helliwell, 1988, Hooker, 2002). However, at the same time that Hamilton argument was gaining ground, the evidence was breaking down; Lee, Ni and Ratti (1985), Hooker (1996) argued that oil price typically does not granger cause macroeconomic variables fluctuation when Data samples were extended past the mid-1980s, specifically oil price decline in the half of 1980s were found to have very little effect on economic activity that predicted by linear models. Hooker (1999) and many researchers rightly argued that the breakdown in Hamilton's argument reflects the greater power to reject misspecified equation brought by the increasing variation in the oil price 1980s and 1990s.

- **Economic Growth and Oil Price**

Oil prices affected large on the Petroleum Exporting Countries because represents oil exports in OPEC countries about 50% to 95% of foreign revenues that the main problem of some OPEC countries is that it relies primarily on oil is a major source of income g and fiscal policy (government spending) in this States

that are not balanced and government spending is affected by price changes very quickly when oil prices are high (in the days of prosperity) is government spending dramatically and vice versa where prices fall below government spending. Oil prices have implications for the economies of oil-exporting countries, particularly oil dependent countries. Thus, a small oil price changes can have a large impact on the economy (Arab Center for Research and Policy Studies, 2016).

The price of oil affects countries all over the world differently. In general, lower prices are considered good for oil importers because it does not improve consumer spending, but also improve the trade balance of the country. Therefore, the increase in oil prices has a large negative effect on the economic growth in all oil-importing countries. On the other side drop in Oil Price is bad for oil-exporters as it could put a depression in revenues of the oil-exporting countries where oil exports play an enormously important role in supporting government finances and GDP growth Moshiri & Banihashem (2012) studied that, many oil-exporting economics are heavily dependent on the exports from oil revenues, so their economic activities boom, when oil prices are high, and their economies suffer, when oil prices are low. Some have suggested that oil price fluctuations, causes subdued economic performance in oil exporting economics (Poelhekke and Ploeg, 2007).

Following the Second World War II, oil in 1967 may become the main source of energy in the world. Over this period, OPEC began to establish itself, however, no pricing power since the power still resides in the hands of Western cross-border that kept global oil prices, oil companies are relatively stable. Crude oil is one of the most important goods in today's industrialized economy because represents a vital energy source for many countries. Its price has been subject to various changes throughout time, in 1970 when the world saw the first significant moves in oil prices, and thus led to one relationship between economic growth and oil prices (yan, 2012).

Crude oil is a vital commodity for both exporting and importing nations, as it is either an important source of income or input factor. A fall or rise in price is therefore of interest to these countries and can impact various macroeconomic variables, like economic growth (Pindyck, 1991).

2.3. Empirical Framework

Mendoza and Vera (2010) following, Mork (1989), Lee et al (1995) and Hamilton (2003) In the case of Venezuela, studied the asymmetric impacts of oil price shocks on an Oil-exporting Economy using Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model data used over the period 1984 to 2008. The results of the researcher showed a significant positive impact of oil price shocks on economic growth. Moreover, the results indicated that the economy of Venezuela has been more responsive to positive the oil price shocks as compared to negative shocks.

IMF (2000) examined the impact of oil price shocks (specifically oil price increase) on the global economy, the study found that impact of an oil price of U.S. $5 has greater consequence on the economy of developed countries than for developing nations in group, with variation in term of the relative size of oil importing to exporting nations accounting for much of the disparity; while oil price fluctuation was specifically lower the aggregate demand there by transferring income from the net oil importing countries to the net oil exporting countries. The result further indicates that the degree of openness, oil intensity level in domestic production, exports and imports accounted for some of the discrepancies. The result also concludes that there is a positive correlation between oil price changes and economic growth of oil-producing nations.

Sinha and Bhide (2000) investigate the relationship between oil price shocks, output and inflation in India, using VAR model, they find out that a 10% rise in the oil price when passed on to the domestic sector prices, would very much likely lead to a 2% rise in the entire domestic price level. Also, a similar study by Bhattacharya and Kur (2005) indicates that a 100% increase in the price of oil would cause a 15% hike in the domestic prices and a decline in industrial production of 3%.

Rautava (2004) used VAR approach to examined the effect of oil price shocks on the Russian economy and concluded that, changes in the price of oil played a vital role in the GDP fluctuation in the country, higher oil price leads to

higher GDP both in the long and short run, also change in the oil price have no significant influence on real exchange rate during the study period.

Jiménez-Rodríguez and Sánchez (2005) investigates the effect of oil price shocks on real GDP growth using multivariate Vector Autoregressive (VAR) approach, a case of OECD countries, using variables considered for the method are the following: real GDP, real oil price, real effective exchange rate, inflation real wage, and long and short-term interest rates. The results found that decline in oil price only significantly affect few countries, while oil price shock plus monetary policy are the major sources of volatility to real GDP in almost all the countries. The author modified the earlier model by employing the standard vector auto regression, the result indicates that a rise in the price of oil influence GDP growth significantly than oil price decrease in most of the countries during the period of 1984 - 2004.

Ayadi et al (2005) in his paper titled "Oil Price fluctuations and the Nigerian Economy" over the 1980 – 2004 periods, using a VAR model and conclude that there is positive response between fluctuations of oil price and GDP, while inflation response negatively to the positive oil shock. While Chuku et al (2011) found that oil price shocks are not a major determinant of macroeconomic activity in Nigeria, however, the result of granger causality test indicates that oil price do not granger cause macroeconomic activity and that nonlinear specification shows that the impact of oil price shocks on Nigerian economy are asymmetric.

Olomola and Adejumo (2006) examined the effect of oil price shocks on output, real exchange rate inflation and money supply in Nigeria using a VAR model and quarterly data from 1970 - 2003. The findings show that oil price fluctuations do not have a significant effect on inflation and GDP in Nigeria, However, oil price shocks significantly influence real exchange rate. Their studies also indicate it is not the oil price itself but rather its manifestation on the real exchange rate and money supply that affects the fluctuations of the aggregate economic activity proxy, which is GDP. They concluded that oil price shock is an important determinant of the real exchange rate, and it is money supply rather than oil price shocks that affect GDP growth in Nigeria.

Olomola (2006) studied the impact of oil price shock in Nigeria on the aggregate economic activity, namely output, inflation, the real exchange rate and money supply applying Vector Autoregressive (VAR) method and using quarterly data during the period 1970 - 2003. Contrary to previous research results, the results of this study fund that there had been no impact of oil price shocks on output and inflation in Nigeria while a big relationship existed between the oil price shocks and the real exchange rate. Moreover, the oil price shock was considered a large specified to real exchange rates and in long-run the money supply, while it was not the price of oil itself but the money supply that have impacted the Nigerian output growth. Therefore, this discovery supported previous researches that monetary policy should respond to oil shocks. In addition, Umar and AbdulHakeem (2010) estimated the effect of oil price shocks on four macroeconomic variables, namely, the real GDP, consumer price index, money supply and unemployment applying Vector Autoregressive (VAR) model. The results fund significant impact of oil price shocks on all the variables, With the exception of the consumer price index and the insignificant relationship between crude oil prices.

Blanchard and Gali (2007) Using VAR model analysis, found that relationship between oil price fluctuation and output in England, US, France, Germany, Japan and Italy changes from negative to become positive from 2000s oil shocks as compared to 1970s and 1980s shocks. Also, there is a minimal impact on GDP, consumer price index and wages during the period under review. Lardic and Mignon (2006) on twelve European countries found that higher oil price affects aggregate economic activity better than lower oil price. In 2007, a study on US economy shows that a 10% increase in oil price leads to a decrease of 1.4% of its real GDP. Nevertheless, oil price increase has no significant effects on US inflation.

Yahia and Metwally (2007) examined the effect of oil prices shocks on Libyan economic growth using data during the period 1963-2004 and applied a Koyck distributed lag scheme, also used Cointegration analysis to examine the long run trade relationship between Libyan oil exports and its GDP. The results indicated that are spread impacts from oil exports to the rest of the economy. The

results of Cointegration analysis suggested that there is no long run linkage between Libyan non-oil GDP and oil exports.

Jin (2008) studied a comparative the effect of oil price fluctuations and exchange rate changes on economic growth in Russia, Japan and China using VAR model. The results found that a rise in oil price because a negative effect on economic growth of Japan and china, while it exerts positive effects on Russia. A 10% increase in the global oil price will lead to 5 percent increase in GDP growth of Russia and a decrease of 1.07 percent in the GDP of Japan.

Ito (2008) and Ito (2010) in the case of Russia studied the impact of oil prices on the inflation level and real GDP. In the former study, the author used the model Vector Autoregressive (VAR) model during the period 1995 to 2007 and the results indicated that the inflation and real GDP responded positively oil price when increase the oil price a positive relationship between them. In a later study, the data during the period 1997 Q1-2007 Q2; using Vector Error Correction approach the author came up with a similar result. The examination leads to the finding that a 1 percent increase in oil prices leads to real Gross domestic product responds growth by 0.25 percent over the next 12 quarters, whereas that to inflation by 0.36 percent during the corresponding periods.

Mehrara (2008) investigated the asymmetric impacts of oil revenues on output growth in 13 oil-exporting economies, namely; Algeria, Libya, Kuwait, Iran, Nigeria, Saudi Arabia, Qatar, United Arab Emirates, Ecuador, Indonesia, Mexico, Colombia and Venezuela using applying two different oil shocks measures and a dynamic panel framework and annual data over the period 1965 to 2004, the researcher found that positive oil shocks were dominated by negative shocks. The adverse impacts of the oil bust on economic growth and continued over a long while a limited role has been played by oil booms in stimulating economic growth.

According to Schirber (2009) the price of oil are not stable; the Different political situations, activities of Organization of the Petroleum Exporting Countries (OPEC), changes in oil supply and demand invite significant oil price vacillations(volatility). The global economy is suffering from a rise in oil prices because oil is the main factor of production in the global economy. Rise in oil prices

not just adds costs at the pump, but also the cost of goods and services (products). It is worth noting that political instability, shrinking supply and increased demand from countries subjects the word economy to oil price shocks.

Samimi and Shahryar (2009) examined the impact of oil shocks on output and inflation in 6 OPEC members, including Saudi Arabia, Nigeria, Iran, Venezuela, Kuwait and Indonesia using annually data from 1970 to 2005, includes on three variables which are real oil price growth, inflation real output growth and using applying structural vector autoregressive (SVAR) method. The results showed that in long term, the effect of oil price shocks on the real economic growth was positive for all the countries, but not Kuwait. In Kuwait, this effect was negative in the long-term, but positive in the short-term. The real Gross Domestic Product was positively impacted by supply side shocks in each economic and for Saudi Arabia, Iran and Kuwait; in long term, this effect was more permanent as compared to the others. In long term, there was a permanent impact and more positive of demand side shocks on inflation as compared to supply side shocks.

Farzanegan and markwadt (2009) study the effect of oil price fluctuation on the economy of Iran using VAR approach and six macroeconomic variables: real industrial GDP per capita, real oil prices changes, real public consumption expenditures, real imports, real effective exchange rate and inflation, using quarterly data for the period 1975 – 2006. The result points out that both positive and negative oil price shocks significantly increase inflation, also a strong positive relationship between oil price fluctuations and growth of industrial output, and a marginal impact of oil price fluctuation on real Government expenditure was reported during the period under review. However, Jbir and Zouari-Ghorbel (2009) found that oil price shocks have no any direct impact on the economic activity in Tunisia using both a linear and non-linear approach. They argued that oil price shocks affect the Tunisian economy only indirectly; moreover, they found Government expenditure as the channel through which the impact is transmitted to the economy.

González and Nabiyev (2009), studied oil price shocks and its impact on GDP growth A case study of Sweden and the USA, data regression of equation for

Sweden and the USA from 1993 to 2008, using Real Business-Cycle Model (RBC). Showed the Swedish economy is more dependent on lower oil prices and GDP growth, a negative link between GDP growth and lower in the price of crude which can be interpreted by the large share of electric, nuclear and hydraulic and the fact that during times of cheap oil states give preference to production of oil and not to the alternative energy sources. America on the contrary showed larger linkage and a negative relationship when prices increase and a positive relationship when prices decrease. While rise oil prices adversely impact stock market returns in the U.S.A, the France and the United Kingdom, the impacts are positive in other states like Australia and Canada as these countries are large exporters of energy resources. The Sweden and U.S.A was chosen to compare their economic growth sensitiveness to oil prices fluctuation. The U.S.A consumes 25% of the oil produced in the world and largest economy and is the most oil dependent among developed states according to the EIA. Sweden consumes relatively less oil per capita than many developed countries and the contrary energy efficient, it is also believed to be one of the most progressive states in using renewable energy resources and developing and therefore less sensitive. The results do not show a pattern of negative relationships for Sweden between real oil price increases and GDP growth, however, the United States of America showed to be more sensitive to oil prices rise.

Lorde, Jackman and Thomas (2009) studied the effects of oil price changes in case of Tobago and Trinidad. Applying Vector Autoregressive (VAR) model, the results found a significant positive impact of positive oil price shocks on output, exchange rate, price level, gross investment and government revenue. The exchange rate appreciation had indicative of Dutch disease.

Omisakin et al (2009) used Vector Error Correction Model (VECM) on data period of 1970-2006, to analyzed the short run implication of oil price shocks on Nigeria, the result shows that an increase of 10% in the price of oil leads to 79% rise in oil proceed, an increase of 45% in Government expenditure, consumer price index decrease by about 11%, money supply increase by 17%, as well as 31%

increase in the GDP in the short run. In a nutshell, the result indicated that Nigerian economy is significantly affected by oil price shocks.

Mehrara, Maki and Tavakolian (2010) in the case of Iran, estimated the asymmetric impacts of oil revenues and economic growth applying the Threshold Error-Correction Model using data during the period 1959 to 2007. The authors found that output growth was greater responsive to low oil revenue regimes than to high oil revenue regimes. The threshold of 37% of oil revenues, in a way that when growth rate of oil revenue was lower than 37% (in the regimes of low or medium oil revenues), the economic growth was positively impacted by oil revenue, but when growth rate of oil revenue was more than 37% (in regimes of high oil revenues), there was no significant effect of oil revenues on output growth.

Mordi, Michael and Adebiyi (2010) investigated the impact of oil price shocks on output and prices in Nigeria, applying structural VAR model and using monthly data over the period 1999 to 2008. The results of the study implied that there was an asymmetric impact of oil price shocks on output, price and exchange rate. And these variables were weak responsive to positive but more responsive oil price shocks to negative oil price shocks.

Nwosu (2010) used Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model to study the effect of oil price shocks on the Nigerian macroeconomic performance, using data from 1970–2008 and variables for the model are the following: Gross domestic product, crude oil prices government capital expenditure, total sale of crude oil, exchange rate, crude export, inflation. The result indicates that oil price shocks a significantly positive affect to GDP, capital expenditure, inflation and the real exchange rate. Oil price during the period contributed to the Nigerian economy, the result concluded that oil price irrespective of its shocks and volatility during the period under study, become the main stay of the Nigerian economy.

Nikbakht (2010) examined the relationship between exchange rate and oil price in OPEC members, in the case of seven OPEC countries namely, Algeria, Indonesia, Kuwait, Nigeria, Saudi Arabia, Iran, and Venezuela using monthly data panel during the period 2000:01 – 2007:12. The results indicated the real oil prices

as the main cause of movement's real exchange rate; finally, the results showed that; there is a long-run relationship between real exchange and real oil prices.

Berument, Ceylan and Dogan (2010) in the selected Middle East and North African (MENA) countries investigated the effect of oil price shocks on economic growth, using variable such as Gross Domestic Product, Consumer Price Index, Ratio of Oil Exports to Crude Oil, Production, Ratio of Net Oil Imports to the GDP, Oil Price, Real Exchange Rate, Inflation, Output Growth and used Vector Autoregressive (VAR) model, as MENA is composed of both oil exporting and oil importing countries. The results showed that positive oil price shocks had big positive impact on economic growth of the oil-exporting economies (Iraq, Algeria, Kuwait, Iran, Oman, Syria, Qatar, Libya and the United Arab Emirates) and vice versa. Whereas, there have been no big impact of oil price shock on economic growth of oil-importing countries (Morocco, Tunisia, Egypt, Bahrain, Jordan, Israel and Djibouti). For finding the impact of oil shocks on the last group of countries, the positive oil shocks were further decomposed to oil demand shocks and oil supply, the finding also believed that the relationship of GDP and oil price is asymmetric in nature. Similar results were also found by Medoza and Vera (2010), and Dées et al. (2005). In more recent study, Elmi and Jahadi (2011) used vector autoregressive (VAR) model to examined the effect of oil price shocks on economic growth in selected OPEC and OECD countries, and found that both countries are significantly influenced by oil price fluctuations, although, the extent of influence varies from country to country.

Arinze (2011) in the case of Nigeria estimated the impact of oil price on Nigeria economy using a simple ordinary least-square regression method to find the effect of oil price on the inflation rate. The study showed that a significant positive impact of oil price and inflation when increases in oil prices leads to rise in inflation rate. Thus, the study recommended that more resources should be used or tapped to diversify the economy.

Eltejaei and Afzali (2012) estimated the asymmetric impacts of oil revenues price and on growth rates of Gross Domestic Product (GDP), Current Expenditures, Government Capital and Consumer Price Index in Iran using quarterly data over

the period 1990 to 2008 using GARCH and Structural VAR models and found that the impacts of positive shocks which increased economic growth was much weaker than the impacts of negative shocks that decreased economic growth. In addition, the growth rate of Government Current and Inflation, and Capital Expenditures showed an asymmetric response to both positive and negative shocks.

Garkaz, Azma and Jafari (2012) in the case of Iran examined the effect of oil revenues in government expenditure during the period 1996 to 2007 using Wavelet analysis approach. During the long run period, a significant and strong positive relationship was reported.

Shaari, Hussain and Abdullah (2012) examined the impacts of oil price shocks on inflation using monthly data during the period 2005-2011 and applying Granger Causality Test and Vector Autoregression and Vector Error-Correction Models (VAR-VECM) model. The results implied that inflation was impacted by crude oil prices. Changes in the price of crude oil led to changes in the rate of inflation.

Adedokun (2012) in the case of Nigeria studied the impact of oil export revenue and the output growth using Error Correction Model during the period 1975 - 2009. The Author found a significant positive impact on oil revenue on economic growth not only in the short run, but also in the long run.

Bouchaour and Al-Zeaud (2012) investigated the impact of oil price crisis on Algerian macroeconomics using data over the period 1980-2011; variables for the model are the following: oil prices, RGDP, Real Effective Exchange, inflation Rate, money supply, unemployment and applying a Vector Error Correction Model (VECM). The key findings that emerged from the paper were (1) the short-run results fund no significant impact of oil prices fluctuations on some of the variables, with the exception that they had a positive impact on the inflation rate and negative impact on the real effective exchange rate. (2) The long run results fond a significant positive impact of oil prices on inflation and real GDP while there was a negative effect of oil prices on the real effective exchange rate and unemployment. (3) Oil prices had no effect on money supply (M2).

Rezazadehkarsalari, Haghiri & Behrooznia (2013) studied the asymmetric impacts of oil price shocks on Real GDP in Iran applying Hodrick-Prescott filtering to separate negative shocks from positive shocks data used during the period 1960 to 2010. Their short run examination results were identical to that of the previous study; that economic growth was significantly impacted by oil shocks, however; the impacts of negative shocks were showed much stronger than positive shocks.

Monjazeb, Souri and Shahabi (2013) examined the effect of oil price shocks and economic growth of Petroleum Exporting Countries applying the annual data over the period of 1990 to 2009 for 26 oil-exporting economies, namely; Sweden, America, Germany, Iran, Netherlands, Australia, Brazil, Belgium, Britain, Denmark, France, Kenya, Japan, Norway, Singapore, Canada, Bangladesh, Egypt, Indonesia, Italy, Norway, Mexico, Kazakhstan, Malaysia, Venezuela and Thailand using the panel data regression model with both fixed and random method. Variables of the method are GDP growth, gross capital formation, employment ratio, the real price and the actual price of oil and gas. The results showed that the negative shocks of oil prices have a negative impact and the positive shocks of oil prices have a positive impact on the GDP growth of oil exporting countries.

Ayoola (2013) also study the effects of oil price fluctuations on the Nigerian economy using SVAR model, using data from 1985:q1-2010:q4, variables for the model are the following: economic output, oil price money, supply, domestic price level, the study concluded that oil shocks have an indirect impact on the Nigerian economy and that monetary policy is the medium or channel through which such impact is transmitted to the economy.

Ibrahim, Ayodele, Hakeem and Yinka (2014) investigate the impact of oil price shocks on Nigerian economy, using data from 1981 to 2012 and using General Method of Moments (GMM), The study found oil price shocks have no positive impact on the Nigerian economy (in contrast to the result of some earlier studies) but oil price itself does. While higher oil price positively affects the economy through its contribution to export revenues (and Government revenues), decline in the oil price cause or help to increase uncertainty in the economy through its negative effect on fiscal policy and implementation of Budget. In spite

of this, the Nigeria's GDP has been, virtually always on the rise; and the economic growth remains impressive.

Edirneligil and Mucuk (2014) examined the impacts of oil price on Turkish economic growth, using annual data during the period 1980 - 2013. Applying the VAR model, unit root test (ADF) to stationarity data, Impulse-Response Function, Variance Decomposition tests and Johansen Cointegration Test. The results indicated no relationship between in the long-run; oil price shock has a negative effect on GDP in the short run and short-term relationship between oil price and GDP.

Yusuf (2014) used Structural Vector Autoregressive (SVAR) model to analyze the impact of oil price fluctuations on Nigerian economy. The result indicted that oil price, agriculture, GDP, exchange rate and unrest has a vital role in shaping the future path of economic growth in Nigeria.

Monesa and Qazi (2014), investigated the impacts of oil price fluctuations on economic growth of oil-exporting economies, using variables GDP growth, investment, exchange rate and the inflation of six OPEC countries using annual data during 1980 to 2013, Applying Augmented Dickey-Fuller (ADF) to establish Stationarity of the time series and Ordinary Least Squares (OLS) model with Vector Autoregressive (VARX) to estimate the impacts of oil price shocks on GDP growth of the six OPEC economies during the period 1980 - 2013. The results indicated a significant negative effect of oil shock on economic growth of Algeria, a significant positive effect of oil price shock on economic growth of Venezuela, a significant positive effect of oil shock on inflation rate of Iran and a significant negative effect of oil shock on inflation rate of Venezuela, whereas, results for rest of the countries and variables were found insignificant.

Mgbame, Donwa and Onyeokweni (2015), examined the effect of oil price fluctuation on Nigeria economic growth. The methodology used purely exploratory. Researchers found there is a significant relationship between Nigeria economic growth and oil price volatility. This implies that oil price volatility determines the level of unemployment, rate of inflation, government expenditure level, which in turn determines the Nigerian economic growth, considering the

destabilizing impacts of oil price changes on economic activity and government spending in Nigeria.

Kurihara (2015), examined the relationship between economic growth and oil prices in Developed Countries using VAR model, included on three variables real GDP, real effective exchange rate and oil price, using Quarterly data during the period 1990 to 2015(q1). The empirical analysis found a positive relationship, oil price increases cause significant economic growth in the European Union, Japan, and the United States. Also, the results also show that appreciation to all local currencies brings economic growth.

Moshiri (2015) investigated Asymmetric impacts of oil price shocks in oil exporting countries and investigated the non-linear impacts of oil price change on macroeconomic performance in two groups of oil exporting countries using a VAR model with price changes estimated by a GARCH model. The model consists and economic growth of oil price fluctuations as two major variables of interest as well as intermediate variables such as exchange rate, inflation rate and investment. Nine major oil exporting countries, three developed and six developing countries, data period during 1970 to 2010. The results indicated that not all oil exporting economics are alike in responding to oil fluctuations. While oil fluctuations have asymmetric impacts in oil exporting developing countries; drop oil prices lead to major revenue cuts and ensuing stagnation in the economy, but accompanying higher revenues and higher oil prices do not translate into sustained economic growth; they do not have a significant impact on economic growth in oil exporting developed countries. The panel data results also suggest that heterogeneous responses to oil price changes in oil exporting countries can be explained by differences in their institutional quality, particularly government effectiveness.

Negi (2015) examined the effects of oil price on GDP of the 4 largest fast growing emerging countries China, India, Russia and Brazil known collectively as the BRIC economies, using a sample of observations during 1987 - 2014. Applying panel data model and the Hausman test, the Ordinary Least Square (OLS), Random Effect Model (REM) And Fixed Effect Model (FEM) were used to find out the effect of Oil Price on GDP. The result shows that; the Oil Price has a positive linkage with

GDP. The Positive coefficient values of Brazil and Russia the positive effect of increased Oil Price on GDP and on the other side the negative coefficient values of India (-0.086) and China (-3.284) shows that, increase in Oil Price has a negative linkage with GDP.

Nchor, Klepáè and Adamec (2016) studied the effects of oil price shocks on the Ghanaian economy, the objective to investigate the dynamic relationship between macroeconomic variables and oil price shocks in the Ghanaian economy, variables for the model are the following: Oil price, Imports, Government expenditure, Industry value added, Inflation, REER, using Vector Error Correction (VECM) and Vector Autoregressive (VAR) models. The empirical results found that both linear and nonlinear oil price shocks have a negative effect on macroeconomic variables in Ghana. Positive oil price changes are stronger than negative changes with respect to the real effective exchange rate, inflation and the government expenditure. Industry imports and value added have stronger responses to adverse oil price shocks. Positive oil price shocks account for about 5% of fluctuations in imports, 30% of government expenditure, 2% of the real effective exchange rate, 6% of industry value added and 17% of the inflation in the long run. Negative oil price fluctuations account for about 20% of fluctuations in imports, 8% of government spending, 2% of the real effective exchange rate and 8% of the inflation in the long run.

Algahtani (2016), investigated the impact of oil price fluctuations on the Saudi Arabia economic activity The variables used in the study are as follows: Real Gross Domestic Product, Real total investment, Real total government expenditures, Real total trade balance, consumer price index. using annual data from 1970 to 2015 to cover each of oil price fluctuations; particularly the recent decline in oil prices amid 2014. The vector error correction (VECM) and vector autoregressive model (VAR) were utilized to investigate the short-run and long-run the relationships between variables. The results indicated a significant and positive relationship between oil prices and the Saudi Arabia GDP in the long run.

Al-mulali (2016) investigated the effect of oil fluctuations on Qatar's GDP growth, Applying the VAR model, the VECM Granger causality test and Johansen-

Juselius and time series data over the period 1970 to 2007 covering all the oil fluctuations. Four variables are used as followed: GDP as the dependent and oil price, total trade value, and inflation rate as the independent variables. The results indicated that oil price has a positive impact on Qatar's GDP, but at the expense of higher inflation. Qatar, which seems to have suffered from the financial surpluses and rapid economic activity caused by the sharp rises in oil prices.

They findings from literature review indicate that there is a huge amount of work done on the impacts of oil price shocks and economic growth and the relationship between oil price shocks and macroeconomic variables for individual oil exporting countries. Since very limited studies yet exist on effects of oil price shocks on macroeconomic variables for a group of oil exporting countries. To fill this gap, this research tends to analyze the link between oil shocks, economic growth and key macroeconomic variables for six members of Organization of the Petroleum Exporting.

CHAPTER THREE
RESEARCH METHODOLOGY

3.1. Introduction

In this study, data on GDP, oil price, Government expenditure, inflation rate, foreign direct investment, exports and imports of each of the six selected Organization of Petroleum Export Countries (OPEC) were collected from the year 1995 to 2014 and organized. Each country was picked with regards to availability of the data it has for all of the variables from 1995 to 2014, country that has missing data or incomplete data was not included in the selection. The data was a panel in nature that consist one hundred and twenty (120) observations. Variables such as GDP and oil price were in US dollars, while Government expenditure, inflation rate, foreign direct investment, exports and imports are in percentage. Natural logarithm of GDP and oil price was taken in order to convert them into rates so as to be uniform with remaining other variables, for valid, efficient and reliable analysis of the data.

After the publication of (Nelson and Plosser, 1982) in paper, which confirmed that most of the time series of finance of the USA has a (Unit Root) which means that most of the time- series is Non-static, Accordingly, the application of traditional methods on a non-static data statistically, leading to a spurious regression estimate and unreliable cannot rely on its results (Akram. S. Yousif, 2016) from this point the panel-data become a more famous and more widely used, and this will be explained in detail later in this chapter, since this study applies panel-data model, which also contains a time-series and cross-section at the same time, it is very important to ensure that these time series are static and does not suffer from unit root. In order to avoid this confusion, the current study will apply unit root tests such as ADF (Augmented Dickey-Fuller) test, and PP (Phillips-Perron) test.

The data was evaluated using pooled OLS, fixed effects and random effects econometric models. To obtain accurate and reliable results, Hausman test was conducted in order to find out which of the model between fixed effects and

random effects is best or appropriate. Finally, a diagnostic test was carried out for validity and reliability of the results.

3.2. Data

In his research, data on GDP, oil price, government expenditure, inflation rate, Exports and Imports of six OPEC countries from 1995 to 2014 were obtained from World Development Indicators (WDI) online database published by World Bank in the year 2015; OPEC database 2015.World Development Indicators (WDI) is subsidiary to the World Bank in which part of their works is collecting of development indicators organized officially by well – known international source. It revealed the most current, accurate and reliable global development data that are available, in nationwide, regional and worldwide estimates. It also presents statistical reference that includes over eight hundred (800) indicators covering more than one hundred and fifty economies. The annual publication is out in April of each year. The online database is restructured three times a year. They release such data on Agriculture, Trade, Economies, Environment and educational training. All these sources were consulted for the collection of the data with regard to this research. This is due to the fact that there were no available data for some of the variables in one source or the other for some years in some countries. The data it was analyzed using the programs Stata 9.2 and EViews 8.1.

3.3. Definition of the Variables

- **Gross Domestic Product Growth**

is the monetary value of all the finished goods and services produced within a country's borders in a specific time period, though GDP is usually calculated on an annual basis, it can be calculated on a quarterly basis as well. GDP includes all private and public consumption, government outlays, investments and exports minus imports that occur within a defined territory. Put simply, GDP is a broad measurement of a nation’s overall economic activity.

The financial dictionary defined GDP growth rate simply means the rate at which the country’s GDP changes from one period to another (usually quarterly or

yearly). The economic growth rate indicates by how much GDP rose or decline within a specified period of time. It is viewed as one of the best measures that show whether the economy of the country is in good condition or not.

- **Government Expenditure (Spending)**

Consists all the expenditure incurred by the government such as on consumption, investment, and transfer payments. In national income accounting the acquisition of goods and services by the Government for current use, to directly satisfy the individual or general needs of the population, is classified as government final consumption expenditure. Government purchase of goods and services for the purpose of creating future benefits, such as investment on infrastructure or spending research activities is classified as government investment (government gross capital formation). These two types of government spending, on final consumption and on gross capital formation, together constitute one of the major components of gross domestic product.

- **Crude Oil Price**

Crude oil can be defined as a naturally occurring, unrefined petroleum product composed of hydrocarbon deposits and other organic materials. Crude oil can be refined to produce a usable product such as gasoline, diesel and various forms of petrochemicals. Crude oil price is the spot price of a various barrel of oil most commonly the west Texas intermediate or the Brent blend. Oil prices, calling the price of West Texas Intermediate (WTI), (Rolling light crude in New York Mercantile Exchange and Brent rolling on the Intercontinental) Stock exchange, Price of a barrel of oil varies from one place to another depending on several factors, such as specific gravity(Density), or API, the sulfur content, and place extracted.

- **Imports**

Imports can be defined as the total monetary value of goods and services that a country received from other countries in the world. They include the value of commodities, shipment, transport, insurance, tour, license, royalties, fees, and other services, such as communication, financial, construction, information, business, personal, and other government services. They did not include

compensation of employees and income from investment (formerly called factor services) and transfer payments.

- **Exports**

Exports can be defined as the total monetary value of all product and services that a country provided to the other countries in the world. They consist the value of commodities, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and other government services. They did not include employee's compensation and income from investment (formerly called factor services) and transfer payments.

- **Foreign Direct Investment**

A foreign direct investment (FDI) is an investment made by a firm, body or person based in one country, into an entity or company based in another country. Foreign direct investment is different from indirect investments such as portfolio flows, wherein overseas institutions invest in shares listed on a country's stock exchange. Firms making direct investments normally have a considerable degree of influence and control over the firms into which the investment is made. Open economies with skilled workforces and good growth prospects are very much likely attract large number of foreign direct investment than closed, highly regulated economies.

- **Inflation**

Inflation rate can be defined as the rate at which the general level of prices for goods and services is increasing and hence the purchasing power of the currency is falling. In other word, it is a measure of how fast a currency loss its value, and how much less one unite of currency buys at present period of time compared to one unit of currency at previous of time.

- **Error term**

Error term is a variable in a mathematical or statistical or method, which is created when the method does not fully represent the actual relationship between the dependent variables and the independent variables.... The error term is also called as the disturbance remainder or residual term. In regression analysis, error term

must be included. The idea behind this is that any independent variable that might not be imagined or think off, error term takes care of it.

- **Models**

The unit root stationary test through Phillips-Perron (PP), Augmented Dickey-Fuller (ADF) tests, appropriate regression models use; Random effects, Fixed effects, Hausman test, Heteroscedasticity test and Diagnostic test.

3.4. The Unit Root (Stationarity) Test

Unit root test is used to find out the integration degree in time-series of economic variables under study to see if it is stable or not. The most contemporary methods in determining the stability of the data is a unit root tests, and its idea depend on the following equation:

$$y_t = y_{t-1} + \varepsilon_t \quad \text{.....(1)}$$

Where:

y_t: the variable at time (t),

ε_t: disorder standard which is characterized by white noise, with mean equal to zero (μ)=0, Cov =(ε_t)=0, and Var=(σ^2=1).

When (P=1) statistically acceptable, it refers to instability case, and the data suffers from (unit root), therefore we must processing each data which in instability case, by taking differences, and processing the (yt), if it's in instability case, by taking differences of degree (1st d, 2nd d) to make it stationary, Therefore, we say about the time-series (integrated) from degree (d) and we mentioned symbol yt ~ I(d). (Razak and Al-Jubouri, 2012).

To find out the Unit Root (Stationarity) we can use tests:

3.4.1. Augmented Dickey-Fuller Test

The distribution of test Dickey-Fuller Expanded based on the assumptions that the random error term is independent statistically and includes a constant variance. So when you use a method of Dickey-Fuller expanded, we must make sure that the error term is unlinked and it includes a constant variance. (Carlos & Bera, 1980), (Ljung & Box, 1978), (Enders & Wiley, 1995) & (Shapiro. & Wilk,

1965). The ADF's equation after the addition of slowing the values of the dependent variable:

$$\Delta y_t = \beta y_{t-1} + \sum_{j=1}^{k} \beta_j \, \Delta y_{t-1} + \varepsilon_t \quad \text{..... (2)}$$

This test basically depends on estimating the following models:

A) Without Constant and Trend:

$$\Delta y_t = (\rho - 1) y_{t-1} + \sum_{j=1}^{k} \rho_j \, \Delta y_{t-1} + \varepsilon_t \quad \text{..... (3)}$$

B) Without Trend:

$$\Delta y_t = \alpha + (\rho - 1) y_{t-1} + \sum_{j=1}^{k} \rho_j \, \Delta y_{t-1} + \varepsilon_t \quad \text{..... (4)}$$

C) With Constant and Trend:

$$\Delta y_t = \alpha + \beta T + (\rho - 1) y_{t-1} + \sum_{j=1}^{k} \rho_j \, \Delta y_{t-1} + \varepsilon_t \quad \text{..... (5)}$$

Where:

Δ : is the first difference operator, α : is a constant, T : is a Trend Time and K : is a Slowdown period

In sum, the Augmented Dicky-Fuller Test basing on the following hypotheses:

∗ H_0: p=1

∗ H_1: p<0

Where: ∗ H_0: is the null hypothesis (i.e. $y_t$has a Unit Root).

∗ H_1: is the alternate hypothesis (i.e. $y_t$does not have a Unit Root).

3.4.2. Phillips-Perron (PP) Test

Phillips and Perron (1988) have developed and generalization of the Dickey-Fuller Expanded method, where they allowed the existence of a autocorrelation in error term, and Phillips-Perron method is a modification of a Dickey Fuller test which takes into account the restrictions less on error term, where permitted the random error term to be non-independent in a few, with homogeneous distribution. This test is based on the account (unit root) first and then statistical value is converted to eliminate the effects of autocorrelation on the probability distribution of the statistical test (Perron, 1988). This test is conducted in four stages (Ahmed & Sheik, 2013).

1- Estimate by OLS of the three models to test Dickey–Fuller with an account Statistics.

2- Estimate the short-term variance $\sigma^2 = \frac{1}{n} \sum_{t=1}^{n} e_t^2$ ..... (6)

3- Estimate correlation coefficient (Su^2) which is called long-term variance extracted through common variances of residuals previous models, where:

$Su^2 = \frac{1}{n} \sum_{t=1}^{n} e_t^2 + 2 \sum_{i=1}^{L} (1 - \frac{i}{L+1}) \frac{1}{n} \sum_{t=i+1}^{n} e_t e_{t-1}$ ..... (7)

In order to estimate the variance, it is necessary to find the number of delays (L) estimated in terms of observation (n).

4- Statistic account Phillips Peron $t^* = \sqrt{K} \frac{P-1}{\sigma} + \frac{n(K-1)\sigma}{\sqrt{K}}$ ..... (8)

Where: $K = \frac{\sigma^2}{Su^2}$ ..... (9)

Phillips Perron's test, is used the same formulas and values tabular, which takes in test Dickey – Fuller, where the first formula takes without constant and time trend, the second without trend time, by assuming that the average time-series not equal zero and the third with constant and trend time, if (t) calculated is greater than the (t) Tabulated it means that the time-series is stable.

3.5. Panel Data Models

Many of studies and researches depended on developed methods to get results which have high levels of active and precision; the statistics and its branches have a great effect to build models and analysis through it to reach right decisions. Regression analysis is interested to build a mathematical relationship between dependent variable and independent variable, this relationship is linear installation and called regression equation in the current decade, the panel data models acquired a great interesting especially in economic and medical. This data recognizes as a cross-section measuring in time series (Zakariya Y. Algamal, 2012) which the Cross-section include the states cities, and institutions (Gujarati, 2013). The main benefit from using panel-data is to increase the precision in prediction by increasing the number of observations through merge between cross-section and time series. Many researchers studied the panel data models, some of them

interested to study properties of panel data models mathematically such as (Bramati and Croux, 2007), (Dustmann and Engarcia, 2007), (Sun, 2010), (Lee and Yu, 2010), (Baltagi et al, 2010), and some of them interested to apply these models in their studies such as (Mikhed, V. and Zemcik,2009), (Chuang and Wang, 2009), (El-Gamal and Inanoghlu, 2005), (Kai and Qin, 2011), (Lukas and Jan, 2011).

The models that use (panel-data) has many advantages more than if used time-series alone or only cross-section; As clarified by the researcher (Baltagi, 2005), as follows:

1- Control in special Heteroscedasticity which appears in the case of cross-section data or time-series data.
2- Panel-data gives better efficiency with increase in the degrees of freedom and less multicollinearity between variables, more of informational content when use time-series or cross-section (Blatagi. B. H, 2005).

When cross-section measured for the same time periods in panel-data then Panel-Data called (Balanced Panel-Data), but If not measured on the same time periods then panel-data called (Unbalanced Panel-Data), from here the panel-data models comes in three main forms:

1- Pooled (OLS) Model (PM).
2- Fixed Effects Model (FEM).
3- Random Effects Model (REM).

Suppose we have (N) of Views in cross-section measured in (T) of time periods; in this case the panel-data model writes as follows:

$$y_{it} = \beta_{o(i)} + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it} \quad , \; i=1,2.....,N \;\; t=1,2.....,T \qquad .....(10)$$

Where: yit is the dependent variable value in the observation (i) in the time period (t), βo(i) is the value of the intersection point in the observation (i), βjis the value of the slope of the regression line, Xj(it) is the independent variable value(j) in the observation (i) in the time period (t), ε_{it} is the error value in observation (i) in the time period (t), It is worth to mentioning here that (i) is means number of countries under study (six Petroleum Exporting Countries (OPEC)).

3.5.1. Pooled (OLS) Model

This model is one of the simplest models in panel-data, where all parameters ($\beta_{o(i)}, \beta_j$) are constant (reject any effect of time). When rewrite the model in the equation (10) we will get Pooled Regression Model OLS as in following formula:

$$y_{it} = \beta_o + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it} \quad , i=1,2.....,N\ t=1,2.....,T \quad .....(11)$$

Where $Var(\varepsilon_{it})=\sigma\varepsilon^2$ and $E(\varepsilon_{it})=0$

Using ordinary least squares method to estimate model parameters in the equation (1) (Greene, W., H, 2012) after rearranging the values of the dependent variable and independent variable, starting from the first cross-sectional data set, with number of observations and by amount of (N*T).

3.5.2. Fixed-Effects Model (FEM)

Is a mathematical or econometric model that presumes variables observed as independent variables and treat them as if they occurred not by chance, it has an ability to control individual differences caused by factors that doesn't change over time (such as culture, gender religion). One of it is set – back is that it cannot be used for the variable that does not change over time (time–invariant) to determine their impact on the dependent variable. But its advantage is that those features that do not change over time are treated as an exceptional to the individual and doesn't compare it to any other individual's features. If residuals are interrelated, fixed effect is not the deserve model to be use, because, the generalization perhaps be incorrect and there is a need to model that relation (Kohler Ulrich, 2008).

In the fixed effects model the target is knowledge of the behavior of each data set, separately by making parameter of the section β_o varying from set to other, with the survival of slope coefficients β_j constant of each data set (Which means we will deal with Heteroscedasticity case, between sets), Accordingly; the fixed effects model will give the following formula:

$$\mathbf{y}_{it} = \beta_{o(i)} + \sum_{j=1}^{k} \beta_j X_{j(it)} + \varepsilon_{it} \quad , i=1,2.....,N\ t=1,2.....,T \quad .....(12)$$

Whereas Var(εit) =σε2 and E(εit) =0

The fixed effects concept means, that parameter for each cross-section do not change over time (time invariant), but the only change happens in data set (Gujarati, 2003). For the purpose of estimating the parameters of model in the equation (2), and allow the parameter of βo to change between cross-sections, usually use Dummy Variables its value (N-1) to avoid the perfect multicollinearity (Greene, 2012), Then use OLS regression. The fixed effects model called (Least Squares Dummy Variable Model). After adding dummy variables D to the equation (2), the model becomes as follows:

$$yit = \alpha 1 + \sum_{d=2}^{N} \alpha\, dDd + \sum_{j=1}^{k} \beta j\, Xj(it) + \varepsilon_{it} \quad , i=1,2.....,N\ t=1,2.....,T \quad .....(13)$$

Where an amount $(\alpha 1 + \sum_{d=2}^{N} \alpha dDd)$ is a change in cross-sections of part βo

And the model also can be written in equation (3) after deleting α1 as follows (Gujarati, 2003), (Greene, 2012):

$$yit = \sum_{d=1}^{N} \alpha\, dDd + \sum_{j=1}^{k} \beta j\, Xj(it) + \varepsilon_{it} \quad , i=1,2.....,N\ t=1,2.....,T \quad .....(14)$$

3.5.3. Random-Effects Model (REM)

The ideology of random effect model is that not as it assumed by fixed effect model. The differences across predictors or independent variable are included in the model. What distinguishes this model with fixed effect model is that this model considers variation caused by unnoticed variables as part of the variation caused by an independent variable; it does not consider whether the variation is by chance. If there is proved that variation across units influences dependent variable, then random effect is appropriate. Time – invariant variables can be included in this model unlike the fixed effects such kinds of variables are absorbed by the intercept (Green, 2008).

In the fixed effects model the error term is ε_{it} have a natural distribution with average equal to Zero, and variance equal to $\sigma\varepsilon^2$, in order to be parameters of fixed effects model correct and unbiased, usually it imposes that the error variance is constant (Homogeneous) for all cross-section data, and there is no autocorrelation

during the time between data set (cross-section data) in the specific time. Random effects model suitable in the case of a malfunction in one of the hypothesis mentioned in the fixed effects model (Gujarati, 2003).

In Random effects model, will be treated with coefficient $\beta_{o(i)}$ as a random variable has a μ value, i.e.

$$\beta_{o(i)} = \mu + V_i \quad , i=1,2.....,N \quad .....(15)$$

By substitution Equ (15) in Equ (12) we get a random effects model as follows:

$$\mathbf{y}_{it} = \mu + \sum_{j=1}^{k} \beta_j X_{j(it)} + V_i + \varepsilon_{it} \quad , i=1,2.....,N\ t=1,2.....,T \quad .....(16)$$

Where V_i represent error term in the cross-section data set (i). The random effects model sometimes called (Error Components Model), because of that the model in equation (6) it contains two (2) components for error V_i & ε_{it}.

The random effects model has mathematical properties, one of them that:

$Var(\varepsilon_{it}) = \sigma_{\varepsilon}^2$, $E(\varepsilon_{it}) = 0$, $Var(V_i) = \sigma\varepsilon^2$, $E(V_i) = 0$.

Suppose we have (Composite Error Term) as follows:

$$W_{it} = V_i + \varepsilon_{it} \quad ..... (17)$$

Where:

$$E(W_{it}) = 0 \quad ..... (18)$$

$$Var(W_{it}) = \sigma_V^2 + \sigma_{\varepsilon}^2 \quad ..... (19)$$

(OLS) Ordinary least squares method, fail to estimate the parameters of random effects model, because it gives incompetent estimates and has standard errors incorrect, which affect in the parameters test, that's because of covariance between W_{it} and W_{is} is not equal to zero i.e.

$$Cov(W_{it}, W_{is}) = \sigma_V^2 = 0 \quad ,t=s \quad ..... (20)$$

For the purpose of estimating random effects model parameters, usually used, Generalized Least Squares (GLS), (Green, 2012).

3.6. Hausman Test

Hausman test also used to differentiate between random effects (RE) model and fixed effects (FE) model in panel data. It gives the right decision between fixed effects and random effects models. It gives a guide to the researcher or analyst on which model between fixed effects and random effects models are the best or appropriate. It essentially tests whether the unique error terms are connected with the regression, the null hypothesis they are not. When the probability value is significant (that is, when p – value< 0.5) then the best and appropriate model is fixed effect model, otherwise is random effect model.

3.7. Diagnostic Tests:

It is very crucial to carry out diagnostic tests on the regression model. Such test of heteroscedasticity, cross-sectional dependency, and serial correlation are invited to ensure that data analyzed is reliable and acceptable results are obtained. For example, the occurrence of heteroscedasticity may nullify the statistical test of significance that assumes residual are unassociated and normally allocated and variance does not change with the effect being.

3.7.1. Testing for Time-Fixed Effects (FE)

To make a decision about any models more accuracy we use joint test to see if the dummies for all years are equal to zero; if the Probability >F is > 0.05, so we failed to reject the null that the coefficients for all years are jointly equal to zero, therefore no time fixed effects are needed in this case and vice versa. To see if time fixed effects model are needed when running (FE) model use the It is a joint test to see when the dummies for each years are equal to Zero, if they are then no time fixed effects.

3.7.2. Testing for Random Effects: Breusch-Pagan Lagrange Multiplier (LM)

The Breusch-Pagan Lagrange Multiplier (LM) test helps you decide between a simple ordinary least-squares (OLS) regression and the random effects regression. The null hypothesis in the LM test is that variances across Entities are

zero. The LM test helps you decide between a random effects regression and a simple OLS regression. The null hypothesis in the LM test is that variances across Entities are zero.

3.7.3. Testing for Cross-Sectional Dependence/Contemporaneous Correlation Using Breusch-Paganlm Test of Independence

According to Baltagi, cross-sectional dependence is a problem in macro panels with long time series (over 20-30 years). This is not much of a problem in micro panels (few years and large number of cases). The null hypothesis in the B-P/LM test of independence is that residuals across entities are not correlated.

3.7.4. Testing for Cross-Sectional Dependence/Contemporaneous Correlation Using Pasaran CDs Test

As mentioned in the previous slide, cross-sectional dependence is more of an issue in macro panels with long time series (over 20-30 years) than in micro panels. Pasaran CDs (cross-sectional dependence) test is used to test whether the residuals are correlated across entities. Cross-sectional dependence can lead to bias in tests results (also called contemporaneous correlation). The null hypothesis is that residuals are not correlated.

3.8. Heteroscedasticity Test

Modified (Wald test) for group wise heteroscedasticity in fixed-effect model:

The idea behind this test is to find out whether the error terms have constant variance (that is whether the error terms are homoscedasticity). It has hypothesis of H0: That is, homoscedasticity (Error terms have constant variance), H1: That is, heteroscedasticity (Error terms have no constant variance). The criteria is to reject null hypothesis when P–value < 5% critical value.

3.9. Model Specification

Model specification in regression analysis is the method or process of specifying Correct or right functional form of the regression model. The essence of this specification is to determine the independent variable(s) that should be or should not be included in the model, so as to yield good effects on the dependent variable. Right specification leads to good results while miss – specification leads to inaccurate results. In this research, the model (Regression equation) applying is following:

$$GDP_{it} = \beta_0 + \beta_1 OP_{it} + \beta_2 GE_{it} + \beta_3 FDI_{it} + \beta_4 IN_{it} + \beta_5 X_{it} + \beta_6 I_{it} + \varepsilon_{it} \quad \text{..... (21)}$$

Where:

GDP = Gross Domestic Product.

OP = Oil Price.

GE = Government Expenditure.

FDI = Foreign Direct Investment.

IN = Inflation.

X = Exports.

I = Imports.

Ɛ = Error Term.

Figure 3. The Conceptual Framework of Relationships Between Variables

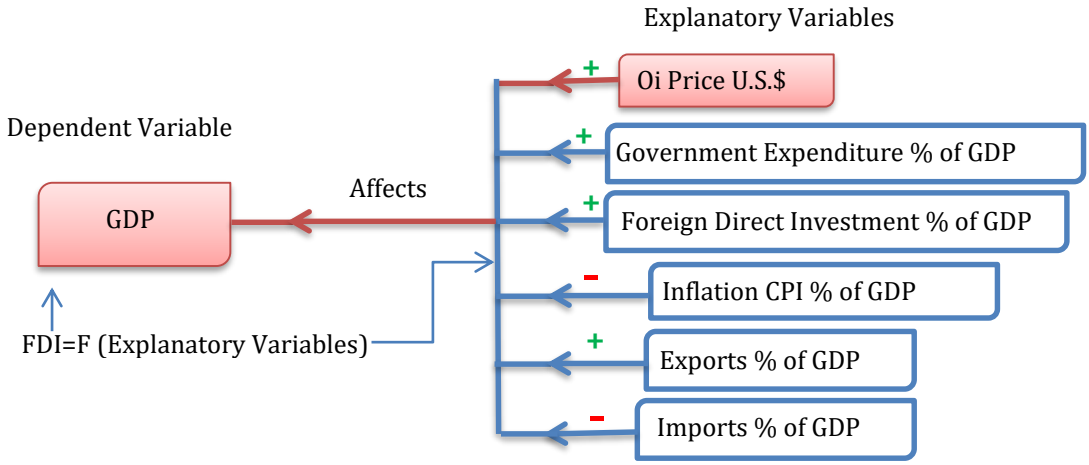


Figure3. The Conceptual Framework
Source: By Researcher

CHAPTER FOUR

EMPIRICAL RESULTS

4.1. Introduction

Here are the presentations of empirical analysis outcomes and explanations of the contributions of the independent variables to the GDP. The main aim of this chapter was to display the result of the analyzed data. At the first instance, descriptive statistics table was displayed, and before analyzing the data and use the necessary tests, using a (Unit-Root Stationarity) for data sets, according to Augmented Dickey-Fuller (ADF) test and Phillips-Perron (PP) test with a constant and a general trend, in order to determine the level of stability in data to test data, follows by pooled OLS regression, fixed effects regression, random effects regression. The models were estimated in finding out the effect of oil price shocks on the economic growth of the selected oil exporting countries. The core objective here is to determine which model is proper for the estimation of our results; hence apply Hausman test and (diagnostics tests) Breusch-Pagan Lagrangian Multiplier test to find out the most appropriate hypothesis.

4.2. Descriptive Statistics

This section showed the summary data of the variables

Table 4.2.1(a) Summary Statistics

Variable	Obs	Mean	Std. Dev.	Min	Max
Years	120	2004.5	5.790	1995	2014
Country code	120	3.5	1.127	1	6
Log GDP	120	25.489	1.014	21.337	27.348
Log oil price	120	3.837	0.690	2.583	4.733
Government Expenditure	120	16.081	6.289	2.331	32.191
Foreign Direct Investment	120	1.353	1.658	-1.315	8.496
Inflation	120	15.481	32.718	-19.576	295.36
Exports	120	41.944	16.372	005.0	77.898
Imports	120	28.618	11.499	015.0	76.841

Source: Author's computation using Stata 9.2 program.

From the table 4.2.1(a) contained one hundred and twenty (120) observations of six selected members of organization of petroleum export countries (OPEC). The average gross domestic product is 25.489; minimum and maximum log GDP are 21.337 and 27.348 respectively. The average log oil price is 3.837; minimum and maximum oil price are 2.583 and 4.733 respectively. The average government expenditure is 16.081; minimum and maximum government expenditure are 2.331 and 32.191 respectively. The average foreign direct investment is 1.353; minimum and maximum foreign direct investments are -1.315 and 8.496respectively. The average inflation is 15.481; minimum and maximum inflation rate are -19.576 and 295.367 respectively. The average export is 41.944; minimum and maximum exports are 0.005 and 77.898respectively. The average import is 28.618; minimum and maximum imports are 0.015 and 76.841respectively.

4.3. The Unit Root (Stationarity) Test

Table 4.3.1 (b) Summary results of the Unit Root (stationarity) test:

Variables	**ADF** test (constant and a general trend)	**Prob**	**PP** test (constant and a general trend)	**Prob**	**Results**
GDP	36.03	0.0003*	55.83	0.0000*	1St Difference
OP	21.22	0.0005*	34.68	0.0472*	1St Difference
GEX	19.21	0.0835***	24.88	0.0154**	At Level~ I(0)
FDI	36.22	0.0003*	79.87	0.0000*	1St Difference
INF	47.27	0.0000**	100.29	0.0000**	At Level~ I(0)
EX	34.84	0.0005**	25.51	0.0126**	At Level~ I(0)
I	23.52	0.0236**	20.22	0.0629***	At Level~ I(0)

Source: Researcher work dependent on the outputs of Eviews 8.1 program.

Note: *Significant at 5% level and Integrated, when taking (1St,d) (1)
**Significant at 5% level and Integrated, from the zero degree I(0) (2)
***Significant at 10% level and Integrated, from the zero degree I(0) (3)

(1) EViews 8.1 program outputs, See: (1St d) means: the data integrated when taking the first-difference.

(2) I(0) means: the data Integrated from the zero degree, which means significant at levels (5%).

(3) I(0) means: the data Integrated from the zero degree, which means significant at levels (10%).

From the table 4.3.1 (b) shows that according to ADF test and PP test with a constant and a general trend (trend and intercept), that the time-series of GDP, Oil price, Foreign direct investment; are not given the degree of stillness identical at level, but it becomes identical after taking the first difference to them. And also significant at level 5%, which means Integrated, from the degree ...I(1st... d). Inflation rate and exports are stable at the level with significant at level 5% and while imports and Government Expenditure showed stable at the level 10%, we say (integrated, from the zero degree)... I(0). These results indicate that all data (time-series) integrated and stable.

4.4. Pooled (OLS) Regression

Table 4.4.1(c) Pooled Regression Results for the Impact of Oil Price Shocks on the GDP:

Log GDP	**Coef.**	**Std. Err.**	**T.statistics**	**P>|t|**
Log oil price	0.928***	0.091	10.19	0.000
Government expenditure	0.028***	0.010	2.63	0.010
Foreign Direct Investment	0.057	0.036	1.59	0.115
Inflation	-0.009***	0.001	-4.82	0.000
Exports	-0.007	0.005	-1.48	0.142
Imports	-0.023**	0.007	-3.35	0.001
Constant	22.525	0.421	53.38	0.000

Note: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Now we can find the estimate regression equation as follows:

Log GDP = 22.525 + 0 .928 log (OP) + 0.028 (GE) - 0.057 (FDI) – 0.009 (IN) - 0.007 (X) - 0.023 (I)

The table 4.4.1(c) above present OLS regression result that evaluates the impact of oil price shocks on the economic growth of some selected Organization of Petroleum Export Countries (OPEC) from 1995 to 2014. GDP is the dependent, the number of observations is 120; the value of R-squared (R^2) is 64% which means the explanatory variables, could explain the dependent variable, by 64% and the remaining 36%, it's back to errors that were not included in the model. The result

indicates that Oil price is significant at 1% level and has positive relationship with GDP; meaning that any 1% increase in oil price, GDP will increases by 92.8%. Moreover, the more oil price increases the more it affects GDP positively, because government will receive much more money or revenue from the sales proceeds of oil at market. Government expenditure is significant at 1% level and has positive relationship with GDP; this indicates that if Government expenditure increases by 1%, GDP will also increases by 2.8%. Government expenditure is always towards providing basic amenities and facilities to the citizens such as security, good healthcare system and good road network system etc. this will increase the standards of living of the populace. Foreign direct investment is not significant at 10% and below but has a positive relationship with GDP; this signifies that Foreign direct investment can only increases GDP by 5.7% at 15% level and above, but our concern is 10% level and below, thus Foreign direct investment is not significant at such levels. Therefore, foreign direct investment is not significant in our case. Inflation is significant at 1% level and has negative relationship with GDP; this indicates that, if inflation increases by 1% GDP will decreases by 0.9%. Because always inflation lessen and decreases the purchasing power of currency; hence more, they always have negative relationship with currency purchasing power parity. Export is not significant at 10% level and below but has negative relationship with GDP; this indicates that Export can only decreases GDP by 0.7% at 15% level and above, but our concern is 10% level and below, thus Export is not significant at such levels. Therefore, export is not significant in our case. Moreover, in reality export and GDP should have a positive relationship that indicates the strength and level of industrialization of a country, but I do not know why such happened may be resulted from the data. Import is significant at 1% level and has negative relationship with the GDP; this indicates that if import increases by 1% GDP will decreases by 2.3%. In reality Import and GDP should have negative relationship that indicates the level of importation and how a country is highly dependent on other countries products and shows how funds are going out to the trading partners.

4.5. Fixed-Effects (Within) Regression

Table 4.5.1 (d) Fixed Effects (within) Regression Results for the Impact of Oil Price Shock on the GDP:

Log GDP	Coef.	Std. Err.	T – value	P>|t|
Log oil price	0.931***	0.054	17.18	0.000
Government Expenditure	0.021*	0.011	1.95	0.053
Foreign Direct Investment	-0.045*	0.025	-1.79	0.075
Inflation	-0.007***	0.001	-6.46	0.000
Exports	0.010**	0.004	2.42	0.017
Imports	-0.017***	0.005	-3.23	0.002
_ Cons	21.801***	0.313	69.46	0.000

Note: *** Significant at 1% level. ** Significant at 5% level. * Significant at 10% level.

Probability > F = 0.000. R-sq = 0.82

Log GDP = 21.801 + 0.931 log (OP) + 0.021 (GE) - 0.045 (FDI) – 0.007 (IN) +0.007 (X) - 0.017 (I)

From the table 4.5.1(d) above, it shows that oil price is significant at 1% level and has positive relationship with GDP; this means that when oil price increases by 1%, GDP will increases by 93.1%. Government expenditure is significant at 10% level and has positive relationship with GDP; this means that when Government expenditure increases by 1%, GDP will increases by 2.1%. Foreign direct investment is significant at 10% level and has negative relationship with GDP; this means that when foreign direct investment increases by 1%, GDP will decreases by 4.5%. Inflation rate is significant at 1% level and has negative relationship with GDP; this means that when inflation rate increases by 1%, GDP will decreases by 7%. Export is significant at 5% level and has positive relationship with GDP; this means that when export increases by 1%, GDP will decreases by 10%. Lastly, import is significant at 1% level of significance and has negative relationship with GDP; this means that when imports increases by 1%, GDP will decreases by 1.7%.

The probability value is 0.000, this indicate that fixed effect model is significance at all level of significant which means all the coefficients are different from zero. Therefore this model is valid, efficient and reliable.

4.6. Random-Effects (Within) Regression

Table 4.6.1 (e): Random Effects (within) Regression Results of Impact of Oil Price Shock on the GDP:

Log GDP	Coef	Std. Err.	z-value	P>|t|
Log oil Price	0.928	0.091***	10.19	0.000
Government Expenditure	0.028	0.010***	2.63	0.009
Foreign Direct Investment	0.057	0.036	1.59	0.112
Inflation	-0.009	0.001***	-4.82	0.000
Exports	-0.007	0.005	-1.48	0.139
Imports	-0.023	0.007*	-3.35	0.001
_ Cons	22.525	0.421***	53.38	0.000

Note: *** Significant at 1% level. ** Significant at 5% level.* Significant at 10% level.

Probability > chi2 = 0.000. R-sq= 0.73

Log GDP = 22.525 + 0.928 log (OP) + 0.028 (GE) - 0.057 (FDI) – 0.009 (IN) -0.007 (X) - 0.023 (I)

From the table 4.6.1(e) above, it shows that oil price is significant at 1% level of significance and has positive relationship with GDP; this means that when oil price increases by one percent, GDP will be increases by 0.928 percent. Government expenditure is significant at 10% level of significance and has positive relationship with GDP; this means that when Government expenditure increases by one percent, GDP will be increases by 0.028 percent. Foreign direct investment is not significant at all levels of significance and has positive relationship with GDP; this means that when foreign direct investment increases by one percent, GDP will be increase by 0.057 percent. Inflation rate is significant at 1% level of significance and has negative relationship with GDP; this means that when inflation rate increases by one percent, GDP will be decrease by -0.009 percent. Exports is not significant at 1%, 5% and 10% levels of significance and has positive relationship with GDP; this means that when exports increases by one percent, GDP will be decrease by -0.007 percent. Lastly, imports is significant at 1%, 5% and 10% levels of significance and has negative relationship with GDP; this means that when imports increases by one percent, GDP will be decrease by -0.023 percent.

The probability value is 0.000, this indicate that random effect model is significance at all level of significant which means all the coefficient are different from zero. Therefore this model is valid, efficient and reliable.

4.7. Hausman Test

The Hypothesis of test:

H0: Fixed Effect Model is appropriate (Null Hypothesis).

H1: Random Effect Model is appropriate (Alternative Hypothesis).

Table 4.7.1 (f) Hausman Test

Log GDP	**B Fixed**	**B Random**	**(b-B) Difference**	sqrt(diag(V_b-V_B)) S.E.
Log Oil price	0.931	0.928	0.002	.
Government Expenditure	0.021	0.028	-0.006	0.0026403
Foreign Direct Investment	-0.045	0.057	-0.103	.
Inflation	-0.007	-0.009	0.001	.
Exports	0.010	-0.007	0.017	.
Imports	-0.017	-0.023	0.006	.

Source: Author's computation using Stata 9.2

Probability > chi2 = -48.40

From the table 4.7.1(f) above shows the result of Hausman test. (b) – Column shows the values of the coefficients of the variables in the fixed effects regression model; (B) – column shows the values of the coefficient of the variables in the random effects regression model while (b-B) Shows the difference between fixed effects and random effects regressions (models). The probability value is not significant at all respective levels of significance (that is, Probability > chi2 = -48.40). The criteria here is that, if probability value is significant at 0.05 level, fixed effects should be accepted as valid model otherwise it is random effect model should be accepted. Therefore, with regards to this research, random effect results are accepted. Here the p-value for the test is - 48.40 is less than 0.05 but not

significant levels; consequently, we reject Null hypothesis and that the alternative hypothesis is accept. Hence, Random effect model is the most fitting according to this test.

4.8. Diagnostic Tests:

4.8.1. Testing for Time-Fixed Effects

The Hypothesis of test:

Ho: coefficients for all years are jointly equal to zero.

H1: The coefficients for all years are jointly not equal to zero.

Table 4.8.1(g) Testing for time-fixed effects

Log GDP	**Coef.**	**Std. Err.**	**T**	**P>|t|**
Log Oil price	1.123	0.092	12.19	0.000
Government Expenditure	0.014	0.007	1.80	0.075
Foreign Direct Investment	-0.056	0.018	-3.04	0.003
Inflation	-0.006	0.0009	-6.64	0.000
Exports	0.008	0.003	2.61	0.011
Imports	-0.009	0.003	-2.27	0.026
_Iyears_1996	0.223	0.127	1.42	0.159
_Iyears_1997 to 2013	.	.	.	.
_Iyears_2014	0.806	0.125	6.45	0.000
_cons	20.98	0.427	49.11	0.000

F (5, 90) = 108.75 Prob > F = 0.0000

(1)_____ _Iyears_1996 = 0

(2-18) _Iyears_1997 to 2013= 0

(19) _____Iyears_2014= 0

F (19, 90) = 8.96

Prob > F = 0.0000

The Prob>F = 0.0000 is less than 0.05, in this case we reject the null hypothesis that the coefficients for all years are jointly equal to zero, therefore time fixed effects are needed in this case.

4.8.2. Testing for Random Effects Breusch-Pagan Lagrange Multiplier (LM)

Table 4.8.2 (h) Random effects Test:

Breusch and Pagan Lagrangian multiplier test for random effects:

LogGDP [countycode, t] = Xb + u[countycode] + e[countycode,t]

Estimated results:

Estimated results:	Var	sd = sqrt(Var)
Log GDP	1.028	1.014
E	0.129	0 .359
U	0	0

Test: Var(u) = 0 Chi2 (1) = 263.60 Prob> chi2 = 0.000

From the table 4.8.2(h) above shows the results of random effects test. The essence of this test is to find out if there is significant difference across the countries; this will gives clue on whether random effects or ordinary least square (OLS) is appropriate, Which has two hypotheses:

- Null hypothesis, H0: Random effect is not appropriate and ordinary least square (OLS) is appropriate.
- Alternative hypothesis, H1: Random effects are appropriate and ordinary least square (OLS) is not appropriate.

If P – value < 5% and conclude that Random effect are appropriate, therefore we acceptance alternative hypothesis (H1) and reject (H0) null hypothesis.

For this study the P – value is less than 5% which's equal to 0.000 indicating significance, as it is shown in Table 4.8.1(h) above, therefore the decision is to acceptance alternative hypothesis (H1) which states that the Random effects are appropriate and ordinary least square (OLS) is not appropriate. Hence we reject the Null hypothesis (H0). Random effect is not appropriate and ordinary least square (OLS) is appropriate. Hausman test and Breusch-Pagan Langrangian Multiplier tests both indicated Random effect to be the most fitting and suitable model to estimate our data. Therefore, the Random Effect result presented above is the appropriate and accurate estimation for this analysis.

4.8.3. Testing for Cross-Sectional Dependence/Contemporaneous Correlation Using Breusch-Pagan LM Test of Independence

Cross – Sectional Test of Independence using Breusch-pagan LM

CORRELATION MATRIX OF RESIDUALS:

	__e1	__e2	__e3	__e4	__e5	__e6
__e1 Iraq	1.0000					
__e2 Iran	0.6302	1.0000				
__e3 Saudi Arabia	0.5319	0.7812	1.0000			
__e4 Kuwait	0.5404	0.7724	0.8335	1.0000		
__e5 Algeria	0.4682	0.8098	0.8299	0.8206	1.0000	
__e6 Nigeria	0.4099	0.5601	0.6453	0.4477	0.4662	1.0000

Breusch-Pagan LM test of independence: chi2 (15) = 128.542, Prob = 0.0000

Based on 20 complete observations over panel units

The correlation matrix above shows the result of correlation of the residuals among the countries. The idea is to find out whether one country residuals have a relationship to other country residuals. It has null hypothesis of H0: residuals across countries are not correlated and alternative hypothesis of H1: residuals across countries are correlated. The decision, is to reject null hypothesis if P – value < 5% critical value. Therefore, from the results, null hypothesis was rejected and conclude that residuals across countries are correlated.

4.8.4. Testing for Cross-Sectional Dependence/Contemporaneous Correlation Using Pasaran CDs Test

Pesaran's test of cross sectional independence = 11.025, Prob = 0.0000

Average absolute value of the off-diagonal elements = 0.637

Pasaran cross sectional dependence (CDs) test is used to test whether the residuals are correlated across entities. Cross sectional dependence can lead to bias in tests results also called contemporaneous correlation. It has null hypothesis of H0:

residuals across countries are not correlated and alternative hypothesis of H1: residuals across countries are correlated. Since P-value =0.0000 is < 5% we reject the null hypothesis, that the residuals are not correlated (No cross sectional dependence) and accept the alternative hypothesis, that the residuals are correlated (have cross sectional dependence).

4.9. Heteroscedasticity Test

Modified Wald test for group wise heteroscedasticity

In fixed effect regression mod

H0: sigma (i) ^2 = sigma^2 for all i

H1: sigma (i) ^2≠ sigma^2 for all i

The Rule:

H0: If Prob > chi2 bigger 5%. Homoscedasticity will be accepting

H1: If Prob > chi2 less than 5%. Heteroscedasticity will be accepting

chi2 (6) = 38.09

Prob > chi2 = 0.0000

The idea behind this test is to find out whether the error terms have constant variance (that is whether the error terms are homoscedasticity). It has hypothesis of H0: Error terms have constant variance (that is, homoscedasticity), H1: Error terms have no constant variance (that is, heteroscedasticity). The criteria is to reject null hypothesis if P – value < 5% critical value and conclude that there is heteroscedasticity. Therefore, from the result null hypothesis can be rejected and conclude that the error terms didn't have constant variance (that is, error terms are heteroscedasticity).

CHAPTER FIVE
SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1. Summary

This research empirically studies the impacts of oil price shocks on the economic growth in oil exporting countries using panel data models for the period of 1995–2014.

Chapter one in this study gives the general introduction of the subject matter under study, introduction, statement of the problem, aims and objectives of the study, research questions, research hypothesis, importance of the study, scope of the work and contribution of the study.

Chapter two analyzed the applicable theoretical and empirical literatures reviews. Where several theoretical and empirical studies that is relevant to this point of discussion was observed; economic growth and oil price or why oil price effect to economic growth?

Data and methodology are in chapter three, were the data on the variables under study and the source of the data were clearly stated. Methods used for the analysis of the data such as fixed effects, random effects, unit root (stationary) test Hausman test, diagnostic test and model specification were presented.

Chapter four was regarded as the most important part of this study, data collected for the analysis, was presented, and analyzed of empirical study. Starting with the unit root stationary test using ADF and PP methods, fixed effects regression was carried out. The essence of the model is to control all time-invariant variables such as culture, race, and religion and so on. All the variables were found to be significant. Random effects regression was also carried out. The idea of this model is that the variation causes by the independent variables were assumed to be random. All the variables became significant.

The unit root stationary test was using unit root of (ADF) and (PP) tests to check the stationary of the data (Panel Data).

Hausman test was carried out in order to find out the appropriate or best model between fixed effects and random effects.

Diagnostics tests were also carried out for the purpose of ensuring that the results of the analysis are valid, efficient and reliable. Some of the tests are:

Breusch and Pagan Lagrangian multiplier test for random effects. The rationale behind this test is to find out at first place, whether panel data can be analyzed using fixed, random effects or ordinary least square.

Cross – sectional test of independence was carried out in order to find out if the residuals of one country have relationship with the residuals of the other country among the ten countries under study.

Heteroscedasticity test was conducted in order to find out whether the variance of the error terms is constant.

Finally, summary, conclusion and recommendation were presented in chapter five in accordance with the findings.

5.2. Conclusion

This research investigated the impacts of oil price shocks on economic growth in six selected oil exporting (OPEC) countries: Iraq, Iran, Saudi Arabia, Kuwait, Algeria and Nigeria. In this study the annual data on seven macroeconomic indicators (GDP, oil price, government expenditure, foreign direct investment, inflation, exports and imports) of six OPEC economies have been used for analysis over the period 1995 to 2014. Base on the results found from the data analyzed. The following conclusions were made:

The first step in the empirical analysis involves testing of the unit root, Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests to establish Stationarity of the panel data models, the results it is found that GDP, oil price and foreign direct investment are variables stationary at first difference. Government expenditure inflation, exports and imports variables are found stationary at level.

Next the Ordinary least-Squares (OLS) Regression was applied and the result shows that the coefficient of Oil price is a positive relationship of Oil Price and GDP and also there is statistically significant. The value of R-squared (R2) indicates a good coefficient of determination (64%) which means the variable in the equation is useful for explaining the effect of Oil price on GDP. Then applied fixed effects

model, the result evident that the estimated coefficient of factor Oil price is highly significant (p –value= 0.0000) the result shows that, Oil Price has a positive relationship with GDP. Then applied Random effects model the result evident that the estimated coefficient of factor Oil price is highly significant (p--value= 0.0000) the result shows that, Oil Price has a positive linkage with GDP.

Statistically, fixed effects model are always a reasonable thing to do with panel-data because they always give consistent results but they may not be the more efficient model to run. Sometime Random effects model can give best P-values as they are a more efficient indicator. So we should run random effects model if it is statistically justifiable to do that.

To choose between Fixed Effect Model (FEM) and Random Effect Model (REM) the Hausman test was applied because it has a distribution asymptotic Chi-square. The results of Hausman test indicated that the probability value (Probability chi2 = -48.40) is not significant and less than 5% meaning that the null hypothesis is rejected and that the alternative hypothesis is accepted, which imply that, the Random Effect Model (REM) is more appropriate model to find out the effect of Oil Price on GDP of oil exporting countries.

Base on the results found from the data analyzed. The following conclusions were made after choosing best model in this study is Random Effects Model:

The result of Random Effect Model of the study also shows that, oil Price and Government Expenditure had a positive significant impact on GDP, also Foreign Direct Investment a positive but not significant in our case. It was found that Inflation and Imports are negative significant on GDP, also Exports negative but not significant in our case. Increase in Oil Price has a positive impact on the GDP of oil exporting countries. Because Increase in Oil Price is considered good for oil exporters as it could increase revenues of OPEC (oil-exporting) countries.

The empirical findings of the study indicated a significant positive impact of oil price shocks on economic growth proxy, which is GDP of selected six OPEC (oil-exporting) countries. This result supports the studies conducted by Umar and AbdulHakeem (2010) and Ito (2008 and 2010).

5.3. Recommendations

- Policy makers in oil exporting countries must to focus on how to stabilize the macroeconomic structure such as GDP of oil exporting countries through diversification of the economy to reduce heavy dependence on the oil.
- Fiscal discipline through the reduction of monetization of the oil proceeds.
- Aggressive saving of the oil proceeds during the oil boom so as to cushion the effect of the future negative oil shocks.

Research work in the future, it is recommended that the scope of the study can be extended in many other ways, similar research with the extension of the sample period action, using different frequency data (monthly or quarterly), applying different models, changing the number of macroeconomic indicators and variables including more lags in order to see the effect again.

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