T. C.
SİİRT ÜNİVERSİTESİ
SOSYAL BİLİMLER ENSTİTÜSÜ
İKTİSAT ANABİLİM DALI
BÖLGESEL KALKINMA İKTİSADI
TEZLİ YÜKSEK LİSANS PROGRAMI

THE IMPACT OF FLUCTUATION OF OIL REVENUE ON REAL EXCHANGE RATE AND THE STRUCTURAL IMBALANCES OF IRAQI ECONOMY (DURING THE PERIOD 1997–2016)

Soran Zaher ABDULLAH

YÜKSEK LİSANS TEZİ

Tez Danışmanı: Dr. Öğr. Üyesi Semih Serkant AKTUĞ

SIIRT - 2018

SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ'NE

Siirt Üniversitesi Lisansüstü Eğitim-Öğretim ve Sınav Yönetmeliğine göre hazırlamış olduğum "The Impact of Fluctuation of Oil Revenue on Real Exchange Rate and The Structural Imbalances of Iraq's Economy" adlı tezin tamamen kendi çalışmam olduğunu ve her alıntıya kaynak gösterdiğimi taahhüt eder, tezimin kâğıt ve elektronik kopyalarının Siirt Üniversitesi Sosyal Bilimler Enstitüsü arşivlerinde aşağıda belirttiğim koşullarda saklanmasına izin verdiğimi onaylarım.

Lisansüstü Eğitim-Öğretim yönetmeliğinin ilgili maddeleri uyarınca gereğinin yapılmasını arz ederim.

Tezimin tamamı her yerden erişime açılabilir.

6./9./ 2018

Soran Zaher Abdullah ABDULLAH

T.C.
SİİRT ÜNİVERSİTESİ
Sosyal Bilimler Enstitüsü

TEZ KABUL TUTANAĞI

SOSYAL BİLİMLER ENSTİTÜSÜ MÜDÜRLÜĞÜ'NE

Dr. Öğr. Üyesi Semih Serkant AKTUĞ danışmanlığında, Soran Zaher ABDULLAH tarafından hazırlanan bu çalışma 06/09/2018 tarihinde aşağıdaki jüri tarafından İktisat Anabilim Dalında Yüksek Lisans Tezi olarak kabul edilmiştir.

Başkan (Tez Yöneticisi)	: Dr. Öğr. Üyesi Semih S. AKTUĞ	İmza:
Jüri.Üyesi	: Prof. Dr. Arzdar KİRACI	İmza:
Jüri.Üyesi	: Dr. Öğr. Üyesi Sıdıka AKDENİZ	İmza:

Yukarıdaki imzalar adı geçen öğretim üyelerine aittir.

06/09/2018

İmza

Adı ve Soyadı

Enstitü Müdürü

Dr. Öğretim Üyesi Veysel OKAY

CONTENTS

CHAPTER THREE

CHAPTER FOUR

ÖZET

YÜKSEK LİSANS TEZİ

PETROL GELİRİNİN REEL KUR DEĞİŞİMİNE ETKİSİ VE IRAK EKONOMİSİNİN YAPISAL DENGESİZLİKLERİ

Soran Zaher Abdullah ABDULLAH

Danışman: Dr. Öğr. Üyesi Semih Serkant AKTUĞ

2018, 71 Sayfa

Jüri üyesi: Prof. Dr. Arzdar KİRACI
Jüri üyesi: Dr. Öğr. Üyesi Sıdıka AKDENİZ
Jüri üyesi: Dr. Öğr. Üyesi Semih Serkant AKTUĞ

Bu tez, petrol sektörü gibi belirli bir ihracat malları sektöründeki hızlı büyümenin reel döviz kuru ve rekabet gücünü ne ölçüde etkilediğini analiz etmektedir. Daha önceki analizlerde "Hollanda Hastalığı" kavramı öne çıkmıştır. Petrol sektöründeki hızlı büyüme ülkenin para birimini değerlendirmekte, diğer taraftan ülkenin geleneksel ihracat sektörünün uluslararası pazarlarda rekabet edebilirliğini azaltmaktadır.

Bu tez Irak'ta Hollanda hastalığının bulunup bulunmadığını incelemektedir. Büyüyen petrol gelirlerinin Irak ekonomisinin petrol dışı sektörlerine etkisi değerlendirilmektedir. Petrol sektöründeki büyümenin ticaret konu olmayan mallar ve ticaret konu mallarda daralmaya yol açtığı amprik olarak kanıtlanmaktadır.

Bu tezin ana bulguları Irak ekonomisinde Hollanda hastalığının olduğudur. Söz konusu hastalığın belirtileri, nispi fiyatlarda artış, reel döviz kuru değerlemesi, daralan ticarete konu mallar sektörü ve tarım dışı ürün çıkışının genişlemesidir.

Bu tezde 1997 yılından 2016'ya kadar ulusal ve uluslararası kuruluşlardan elde edilen yıllık zaman verileri kullanılmıştır. Son olarak tez, reel döviz kurunun değer kazanmasından ve ekonominin yapısının ticarete konu mallardan ticarete konu olmayan mallara dönüşmesinden kaçınmaya yönelik öneriler getirmektedir.

Anahtar Kelimeler: Reel Döviz Kurları, Hükümet Harcamaları, Para Arzı, Kişi Başına GSYİH, Ticarete Konu Mallar ve Ticareti Olmayan Mallar.

ABSTRACT

MASTERS THESIS

THE IMPACT OF FLUCTUATION OF OIL REVENUE ON REAL EXCHANGE RATE AND THE STRUCTURAL IMBALANCES OF IRAQI ECONOMY

Soran Zaher Abdullah ABDULLAH

Supervisor: Asst. Prof. Dr. Semih Serkant AKTUĞ

2018, 71 Pages

Jury Member: Prof. Dr. Arzdar KİRACI

Jury Member: Asst. Prof. Dr. Sıdıka AKDENİZ

Jury Member: Asst. Prof. Dr. Semih Serkant AKTUĞ

This thesis analyses the extent to which a boom in a particular export commodity sector (i.e., oil) affects the real exchange rate and competitiveness in the rest of the economy: This problem has been analyzed in the early stage by Corden and Neary (1982) with the so-called 'Dutch-disease'. As a result, the booming sector (oil sector) the country's currency appreciates, thereby reducing the competitiveness of the country's traditional export sector in the international market. This thesis examines whether Dutch Disease is present in Iraq in the light of having not study about Dutch Disease phenomena. It evaluates the impact of growing oil revenues on non-oil sectors of the Iraqi economy. It produces some empirical evidence for the explanation non-tradable goods and contraction of the tradable goods sector due to the booming oil sector and appreciating real exchange rate and made tradable goods sector become uncompetitive for export. The main findings from this thesis that the Iraqi economy was subject to have the Dutch disease phenomena during the boom. Some of the indications of the disease, remarkably the increase of relative prices, the real exchange rate appreciation, contraction tradable goods sector and expansion of nontraded goods output were applicable. The study uses annual time series data sourced from home and international agencies from 1997 to 2016. Finally, The dissertation discusses briefly some policy measures that will help avoid the issue of appreciation real exchange rate and changing the structure of economy out of tradable goods to non-tradable goods sector.

Key Word: Real Exchange Rate, Real Government Expenditure, Real Money Supply, Real Oil Revenue, Tradable Goods and Non-tradable Goods.

DEDICATION AND ACKNOWLEDGMENT

This thesis is dedicated to my parents, to my mother your guidelines and constant patronage is always extraordinary. Also, to my Grandfather, to my brothers and sister, I Also dedicated to my wife and children, you are the backings that I will continuously lean on; this project would not have been successfully completed without your huge sustenance.

Praise be to God for completion and thank him for the pleasure, The most important thing that God preferred to me was the reasons for completing the research, like any other research that has not been completed, it is only by extending the help of many who have time to remember and thank them.

I'm very grateful To my supervisor, Assistant Professor Dr. Semih Serkant AKTUĞ who gave me his wide knowledge and abundant information**.** I'm very grateful to my teacher Prof. Dr. Arzdar KİRACI, who gave me his wide knowledge and abundant information.

Furthermore, I'm very thankful to the Dr. Kamaran Qadr YAQUB, who helped me a lot in all aspects of research and analysis of the standard research, also I show my greatness for Teacher Hawre LATİF, who has helped and encouraged me with his valuable observations.

ABBREVIATION AND SYMBOL ISTS

Abbreviation	Explanation
RER	Real Exchange Rate
VEC	Vector Error Correction
MS	Money Supply
GE	Government Expenditure
Y	GDP Per Capita
UN	United Nations
PPF	Production Possibility Frontier
TN	Non-tradable goods
T	Output of Tradable goods
OFFP	Oil for Food Programme
IMF	International Monetary Found
TPC	Turkish Petroleum Company
IPC	Iraq Petroleum Company
UK	United Kingdom
OPEC	Organisation of Petroleum Exporting Countries
CNPC	China National Petroleum Corporation
BP	British Petroleum
RO	Oil Revenue
VIF	Variance Inflation Factor
ADF	Argument Diggy Fuller

SYMBOL EXPLANATİON

%	Percentage
$\boldsymbol{\beta_i}$	Slopes of the Independent Variables
$\boldsymbol{\beta_0}$	Constant
$\boldsymbol{\varepsilon_t}$	Error Term

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

The role of the oil sector in most of oil-exporting developing countries is very significant as long as they depend on oil at the high percentage in terms of GDP and government revenue. Thus, any fluctuation takes place in oil price may crucially affect the whole economic activities in these countries. Since the 1970s the Iraqi economy was considered as the main exporter of oil and oil sector to GDP consist nearly 75 percent to GDP and became the main source of government revenue, Ministry of Natural Resources (2017).

The Iraqi economy has experienced an oil fluctuation during the last five decades, however, this study concentrates only two decades from 1997 to 2016. During the period of this study, the Iraqi economy goes through a booming period in oil sector except 2015 and 2016 which went through a sharp decline in oil sector due to low and price and decline production as a result of political instability.

Therefore, during high oil revenue, the national income increased and the balance of payments went into surplus. Nonetheless, adverse side-effects may take place, especially an asymmetrical impact on the allocation of resource, income distribution, and imbalance between economic sector.

Based on economic literature (see Corden and Neary 1982 and Edward 1983 and 1986), during the booming period of oil, some macroeconomic variables can change as the following:

- The appreciation real exchange rate can take place.
- Deterioration in tradable goods output.
- Expansion of non-tradable goods output.

The negative side-effects of the oil sector are recognized in the economic literature as the 'Dutch disease phenomenon', Corden and Neary (1982). It is worth mentioning that in Iraq the traditional traded goods sector before discovering oil was the agriculture sector. Therefore, the Dutch disease in this dissertation is carried out with the assumption that Saudi Arabia may suffer from a decline in the traded goods sector, whereas the manufacturing base is likely to grow in the future as a diversification target

of not highly reliance on the oil as the major source of national income Corden and Neary (1982).

Although the role of oil sector started from the 1970s, from 1997 after a decade of economic sanction, the Iraqi enjoyed the high oil revenue since the economic sanction was partially removed by United Nations Security Council. After 2003, the role of the oil sector in Iraqi economy became more crucial since the Iraqi government was allowed to export any amount of oil due to removing economic sanction completely by United Nations Security (UN). Hereafter discussing some important points about the booming sector and the Iraqi economy. The question here why the booming oil sector creates a problem for the economy in oil exporting countries including Iraq Corden and Neary (1982).

CHAPTER ONE

1. MATERIAL AND METHOD

In this chapter, some of the important points will be shown which can be used as a guide for this dissertation. Diagnosing the problem of Dutch disease can be the core of the study in this chapter which is related to appreciation and depreciation Real exchange rate (RER) Section 2. of this chapter is about the importance of the study. While section 1.3. is related to research questions. The hypotheses of the dissertation will be in section 1.4. Methodology and source of data will be in section 1.5. and 1.6. respectively. While section 1.7. discusses the limitation of the study. Last but not least will be about the outline of the study which is in section 1.8.

1.1. Diagnosing the Problem

Increasing oil price is considered as a starting point of the problem since increasing revenue from oil creates a strong real exchange rate for a domestic currency of exporters oil. The strong real exchange rate can affect negatively the capacity of the country's exports commodities such as agriculture and manufacturing sectors. In other words, appreciation real exchange rate makes the non-oil tradable goods less competitive in international markets, which in turn lead to decrease the volume of the country's exports in the non-oil tradable sector. On the other hand, during the oil boom the non-tradable goods sector can expand and grow faster. The reason behind that related to a strong real exchange rate (appreciation real exchange rate) which lead to shifting the resources from non-oil tradable goods to non-tradable goods sector, eventually the tradable goods sector will shrink, while the non-tradable goods sector will enlarge. Here, the question is raised, why changing the structure of economic toward the non-tradable goods from tradable goods makes a problem. Scholars such as Edwards and Aoki (1983). pointed out that shrinking non-oil export commodity sector will negatively affect the balance of payment particularly when the oil revenue decline which affects both monetary and fiscal policies. Thus, in this case, the country's leaders to depend on one product to export (non-diversify economy), which will be very sensitive and easily affected by any fluctuation of the price of commodity exports. The

domestic economy will be mainly depending on global economy which is called dependency economy.

1.2. Important of the Study

This study is important since it is going to diagnosing the problem of depending oil sector and showing some solution to minimize of depending on one product to export. During the last two decades, the Iraqi economy faces the sharp fluctuation of economic activities due to sharp fluctuation international oil price. Therefore, this study is important in order to investigate why oil became the main product to export in Iraqi and why creates a problem for Iraqi economy and also changing the structure of Iraqi economy towards construction and service sector from the agriculture sector (OPEC, 2016).

1.3. Research Question

In this dissertation the author will look at an answer some questions that are written as follow:

- Has the real exchange rate appreciated in response to the increasing oil revenue?
- Has the traded goods sector is squeezed as a result of the increasing oil revenue?
- Has the increase in oil revenue brought about an enlargement of the nontraded goods sector?

1.4. Hypothesis of the Study

In this study, three hypothesis will be investigated.

1) The Real exchange rate is expected to be appreciated during high oil revenue.
2) The Output of Tradable goods will be contracted when oil revenue increases.
3) The Non-tradable goods output will be enlarged as a result of increasing oil revenue.

1.5. Methodology

In this dissertation, the method will be employed is the Vector Error Correction Model (VECM), however, Some tests are required before conducting the VECM test such as Stationarity or converting data to stationarity. On the other hand, the issue of normality, heteroscedasticity and Co-integration tests, will be also considered as the main test will be applied in this dissertation (Kamas, 1986).

1.6. Source of Data

In this dissertation the data generally depends on two main sources, the first one is domestic data and the second one is international agencies data. Domestic data comes from the Iraqi ministry of finance, Ministry of planning and Iraqi central bank. While data from international agencies come from the World Bank, International monetary fund (IMF) and Organization petroleum exporting countries (OPEC).

1.7. Limitation of the Study

The limitation of this study is related to employ different sources of data since the measurement and indexes between agencies can be different, this may create the same limitations for this study. The reason behind that is related to the fact that using different measurement for calculating data may have different conclusion and result. However, in real life collecting data from one source can be very difficult particularly for the Iraqi economy, Sachs and Warner (2001).

1.8. Outlines of the Study

This dissertation is divided into four chapters, the first chapter Material, and Method the paper. The Material and Method chapter provides some basic information about the whole dissertation particularly research question and the importance of this study. This chapter is important because it explanins the detail of the dissertation in terms of important of the study and also explaining the method that has been used in this study. Chapter two is about literature review including theoretical and empirical literature about the impact of fluctuation oil revenue on oil exporting countries. İn every

study the litriture is one of the most important chapter to explain the phenomenon that is stidied by researcher. Chapter three considers the background of the Iraqi economy during the period of this study. The reason behing writing this chpater is because this studies is about Iraqi economy, therefore investigating background of Iraqi economy wouldbe very important for this thesis, therefore writing about the features of iraqi economy is significantly important. Chapter four is an empirical test for the study which the author employs regression analyses. Emplying econometrics technic one of the most important tools that economists use it in order to explain economic phenomena. Therefore it is necessary to use some econometrics tools in the economic study. The last chapter is conclusion part which shows what the outcomes of the study.

CHAPTER TWO

2. LİTERATURE REVIEW

The effect of natural resource exports in general, and oil exports in particular, on a domestic economy has long been debated. Some theoretical and empirical studies have been carried out to determine the changes in the economic structure in the economies of industrial nations. However, the developing nations have had comparatively less attention given to them. Fewer studies have been conducted to investigate the consequences of instability in oil revenue or high oil revenue on a local economy, especially for oil-producing developing nations or low absorptive oil-producing nations. In addition, the issue of the Dutch disease is a great interest to many economists.

This chapter will be divided into eight sections. Section 2.1. is a summary of the literature on the natural resource price and revenue instability. In section 2.2. will be about spending effect with its graphical explanations. In section 2.3. The resource movement effect is analyzed with also graphical explanations. Both section 2.4. and 2.5. will be about model and real exchange rate. Section 2.6. is about the output of tradable and non-tradable goods sector in Iraq. Section 2.7. will be about the correlation between main variables that have been used in this dissertation. Last section 2.8. will be about Oil Price, Real Exchange Rate, and Structural Change.

2.1. The Theory of Dutch Dısease: A literature Revıew

ElIman (1981) Argued that the sizeable growth of the oil sector has triggered a large and growing literature concentrating on the impact of such growth on the rest of the economy. The commodity exports sector may affect the tradable goods sector negatively and non-tradable goods positively. It creates some macroeconomic changes via real exchange rate changes.

Ismail (2010) The Dutch disease is the process by which a boom in a natural resource sector results in shrinking non-resource tradable. This process triggers to increased specialization in the resource and non-tradable sectors leaving the economy more vulnerable to resource-specific shocks. If a positive shock to the resource sector (booming period of oil) occur in a country that is a net resource-exporter, then resource

wealth of the country effectively increases, and consumers expect more resource revenue.

World Bank (2008) The term 'Dutch disease' is the effect on a country's economy when it receives a lot of revenues from exporting a natural resource. It was named after the period in the Netherlands when the contribution of the manufacturing sector sharply declines to real GDP after the discovery of a major natural gas field. The theory goes that oil exports result in large inflows of foreign currency which brought about an appreciation real exchange rate and eventually makes the tradable goods sector (manufacturing and agriculture sector) less competitive in international market.

Edwards (1983) Changes in commodity export prices have generally a significant effect on the real exchange rate, particularly for those countries who demand one product in their exports such as oil-exporting developing countries. Most recent study work on the interaction between the price of commodity export prices and real exchange rates has focused on the long-term real effects of changes in export prices, analyzing how.

An increase in the price of commodity export (oil in our case), typically results in a surplus balance-of-payments and an accumulation of international reserves. If this increase in reserves is not fully sterilized, the money supply will increase, and inflation will likely result. Here it is important to mention that the rate of inflation among non-tradable goods sector (construction and service sector) would be larger than the rate of increase price of tradable goods (Manufacturing and agriculture sector). This is because the price of tradable goods sector is determined by the international market, while the price of non-tradable goods is determined domestically (endogenously). The increase in the money supply via increase foreign reserve is one of the mechanisms that affect the appreciation Real Exchange Rate (RER). Increase commodity export price does not only affect the money supply but also affects GDP per capita and in oil-exporting developing countries also Government Expenditure (GE) is affected by increasing oil price. Therefore, increase both Government Expenditure (GE) and GDP per capita also affect the price of non-tradable goods via increasing demand on it.

Salter (1959) Pointed out that an increase in income will bring about excess demand for both categories of goods and thus cause the expenditure to increase.

Changes in relative prices will appear in the expenditure effect persists leading to a rise in the price of non-traded relative to traded goods.

Kamas (1986) Developed a macroeconomic model to investigate the impact of coffee price on Real Exchange Rate (RER) and the structure of the Colombian economy during the period 1967-1982. She found that relative prices of the non-traded goods sector increased sharply compared to the price of tradable goods which eventually lead to appreciate Real Exchange Rate (RER) as a result of increasing international price of coffee. Based on what she found in her study, the output of non-tradable goods was enlarged, while the output of tradable goods sector was shrunk due to loss of competitiveness for non-coffee tradable goods in the international market. Kamas (1986) used Money Supply (MS) Government Expenditure (GE) and the international price of coffee. The reason behind employing these variables is basically related to the mechanism that Edwards model talked about when the Money Supply (MS) and Government Expenditure (GE) increases the demand on both tradable and non-tradable goods increase. But the price of tradable goods is not significantly affected since its price exogenously determined, therefore the price of tradable goods sector is considered as a price taker. While the price of non-tradable goods is determined endogenously, this means any changes in demand in this sector lead to increase its price. Thus, the rate of increase price of non-tradable goods would be larger than the rate of increase price of tradable goods and eventually, the appreciation Real Exchange Rate (RER) will take place.

Warr (1986) Examines the impact of increasing oil revenues from 1973 to 1982 on relative price and income distribution. He found that the contribution of the agricultural sector in the overall GDP decreased whilst the contribution of the service sector increased.

Fardmanash (1991) Developed a reduced-form model to examine the impact of the international oil price on the percentage of contribution services, agricultural and manufacturing sectors in the non-oil GDP in five oil exporting countries in OPEC. He concluded that the oil revenue negatively affected the agricultural sector in favor of the manufacturing and services sectors. However, Fardmanash ignored the impacts of the spending effect as well as the domestic prices on the tradable and non-tradable outputs.

Benjamin, Devarajan, and Wiener (1989) Developed a general equilibrium model to investigate the impact of increasing international crude oil price in 1979 on the Cameroon economy. They found that the appreciation Real Exchange Rate (RER) significantly took place by around 8.5% which brought about an overall decline in their exports by nearly 6.1% and increase the size of import by around 10%.

Looney (1990) Examined the impact of the oil boom on the Saudi Arabian economy via the Five-Year Plans. He outcomes a series of equations linking to the structure of economic that relating to the size of the output. He tested the output of tradable (agriculture, manufacturing) and non-tradable (construction, wholesale and retail trade, transport) against the real exchange rate, level of inflation, level of government spending, overall non-oil GDP and the added value of oil. His results were significantly related to the existence of the Dutch disease in terms of real exchange rate appreciation and changing the structure of the economy in favors of non-tradable goods output.

Musonda and Lovanda (1991) Developed a model to test the existence of the Dutch disease during the coffee export boom in *1976-77* on the Tanzanian sectoral output. They examined the impact of the boom on the real exchange rate and relative prices. They concluded that many sectors were not affected in terms of resource movement due to the government restrictions and intervention.

AI-Gaeed (1991) Constructed a model to test the impact of the booming oil the sectoral structure of the Saudi Arabian economy. He concluded that the spending effect affected positively and the relative prices and the appreciation real exchange rate occurred. However, the traditional sectors contracted in favors of the non- traded goods sector. He tested the impact of the spending effect rather than the resource movement effect.

Kazar (1990) This study found that the non-oil tradable goods became less competitive and shrunk sharply due to the oil boom. Since increase oil price led to the balance of payment surplus. While the non-tradable sector grown significantly due to appreciation real exchange rate.

Nidal Shaker Jouda (1991) Concluded that the oil exports have a positive impact on the balance of payments (surplus of the balance of payment). As Edwards mentioned

that surplus brings about increase Money Supply (MS), Government expenditure (GE) and GDP per capita which eventually lead to appreciate Real exchange rate (RER).

Abdul Karim Abdullah (2007) Concluded in his study that the role of the oil sector to determine the output of the other sector is very important for oil exporting countries. Oil revenue has negatively on an agriculture sector and positively affect the level of output on construction and service sector.

Roemer (1994) Re-examined Corden and others' medium-run and Long's long-run theoretical Dutch disease framework for developing countries. He concentrates on the influence of an export boom in the oil and gas sectors on the developing nations' economies. The characteristics of the developing countries' environment in relation to the Dutch disease have been considered. Roemer argues that, in developing countries, one cannot generalize the predictions of the Dutch disease phenomenon. Such a conclusion arises from the fact that these nations have different structures and features, which bring about an unpredictable influence compared to what occurs in developed countries. For instance, developing countries are suffering from underemployment (particularly disguised unemployment) instead of full employment.

Moreover, Gylfason (2001) and Davis and Tilton (2005) Criticized the structural adjustments that occur within a country throughout a natural resource boom. Some developed nations like Norway and the United Kingdom have gone through similar experiences. In reality, the Dutch disease allows a nation to take advantage of its newfound mineral wealth by enhancing resources to flow from other sectors to the booming sector. If natural (capital) assets are changed into human or physical capital, then they can encourage the economic growth rate; however, if natural (capital) assets are consumed without converting these assets into other productive capital, then the economic activity will slow down. Therefore, in both cases, natural resources may improve economic development since these natural resources offer chances and opportunities to developing nations.

Usui (1997) Provides a comparative study of Mexico and Indonesia when both countries changed their policy adjustments due to an increase in the international oil price, with special reference to the Dutch disease phenomena. He found that Mexico shows a clear-cut example of the Dutch disease; however, Indonesia has not faced the

Dutch disease phenomena. This outcome illustrates a striking contrast, particularly in the two countries' monetary and fiscal policy, and emphasizes that good macroeconomic management (as was the case in Indonesia) is a very important factor in avoiding the Dutch disease phenomena. Besides subsidise investment by using oil returns to support the tradable sector is another factor helped for Indonesian success. This means that good management in fiscal policy may be a very significant factor in avoiding the Dutch disease syndrome.

2.2. Spending Effect

In the following diagrammatical analysis, the mechanism and impact of the boom oil price are analyzed. The diagrammatical analysis is used to discuss the impact of an increase in the price of oil on the relative price of non-tradable goods to tradable goods, real exchange rate and the output of tradable and non-tradable goods.

Salter (1959) Illustrates the implications of such changes in both relative price and level of output in the economy.

A rise of the relative price of non-tradable goods to tradable goods leads to three consequences: (A) Regarding the demand side, an increase in the price of non-tradable goods leads to a decrease in the quantity demanded for non-tradable goods; (B) Regarding the supply side, an increase in the price of non-tradable goods leads to an expansion in the output of non-tradable goods because of the higher profitability attained from an increase in price; (C) The slope of the relative price of non-tradable goods to tradable goods becomes steeper than it has been before. A change in the slope of the curve relies on the strength of the substitution and income effects affecting the non-tradable goods sector. Thus, the influence of income and substitution effects was changed to spending and resource movement effects by Corden and Neary (1982). However, The increase in the relative price of non-tradable goods to tradable goods eliminates the excess demand for non-tradable and excess supply of tradable goods.

The impact of the spending effect (real government expenditure) on the output of tradable and non-tradable goods can be identified by (A) a worsening of the local, tradable output, and (B) an enlargement of the output of the non-tradable goods. Therefore, deindustrialization results from the impact of the spending effect, thus

triggering Real exchange rate (RER) appreciation, and so domestic products will be more expensive (loss of competition) Corden and Neary (1982).

2.3. The Resource Movement Effect

The resource-movement effect occurs if the booming sector shares domestic factors of production with the other sectors of the economy. If so, then there is a tendency for the price of the factors to be bid up which would further squeeze the traded goods sector. "The boom increases the marginal product of factors initially employed in the booming sector, and so draws resources out of other sectors" (Fardmanesh, 1991). Consequently, there is a decline in the traded goods sector whose producers would be unable to pay the higher prices for factors of production. These producers are unable to compete for the inputs, thereby preventing the manufacturers from purchasing all of the supplies needed to maintain production levels. As a result, these producers decrease their output, contracting the traded goods sector (Nyatepe, 1994). However, if the booming sector does not participate in the competition for factors of production, then according to the resource-movement effect is non-existent (Fardmanesh, 1991). The Most theoretical analysis seems to treat the oil sector as though there is no participation of the factors of productions in the other sectors of the economy. This might be acceptable as a result of the fact that oil is a highly capital intensive advanced technology (enclave sector), and highly skilled-labor sector. Nevertheless, one can examine what would happen when the oil sector shares some factors of production with other sectors in the domestic economy. Therefore, it is assumed again that each sector has its own specific factor in addition to labor is assumed to move freely between all economic sectors (Nyatepe, 1994).

As long as we assume that the labor input can move freely between economic sectors, an increase in the rate of wages in the non-tradable goods sector leads to an increase in the rate of wages in all other sectors including the tradable sector. In such cases, the increase in the rate of wages in the tradable goods sector leads to a decline in the output of tradable goods and raises the output of non-traded goods (expanding output of non-tradable goods sector at the expense of a deterioration in the traded sector). Thus, an appreciation in RER will take place resulting from the spending effect (Salter, 1959).

The prior analysis is concerned with long-term changes. Such analysis assumes the flexibility of the factors of production. In reality, the quantity in which both categories of goods (traded and non-traded goods) can be produced is determined by the short-term current structure of production, instead of long-term prediction. Therefore, responses to adjustments in relative prices are initially on the demand side, whereas responses on the supply side have little influence in the short term either towards internal or external equilibrium. However, the cure may not be devaluation or deflation, due to the possibly severe outcomes of the amount of production and investment, but changes to relative prices may help the situation. This change will lead to disequilibrium in the balance of payments for the sake of full employment (Salter, 1959). Following the Salter's model, several other economic models have been developed, particularly after increasing international oil price at the beginning of 1970 to analyze the impact of increasing natural resource revenue on the domestic economy of natural resource exporters.

2.4. The Model

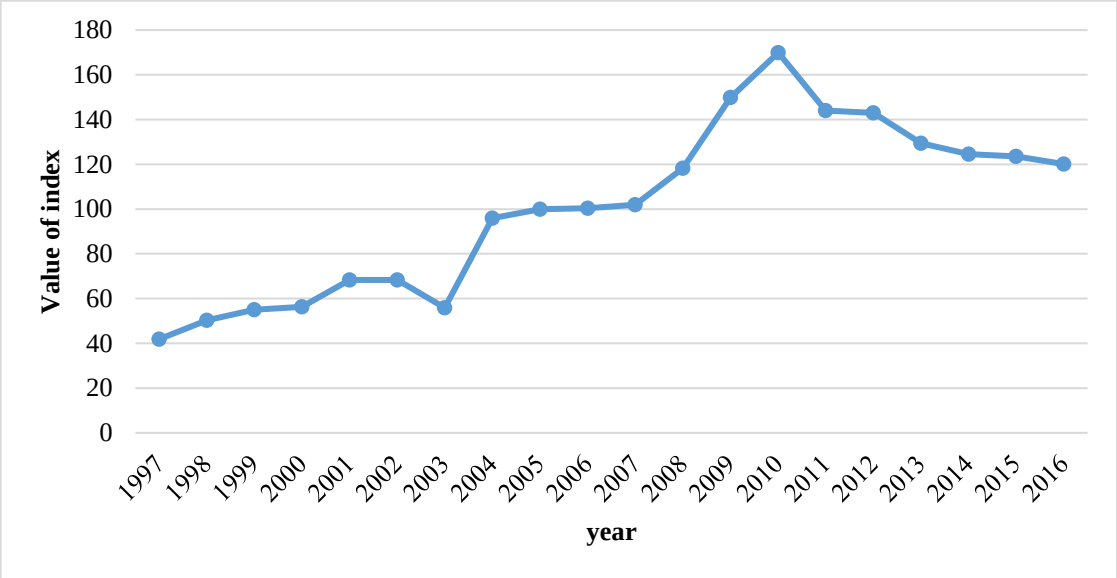
This section examines the model of the way in which oil prices, the real exchange rate and structure of the economy. A central purpose of the model is to test formally whether, as a number of authors have casually observed, particularly Edwards changes in oil prices have indeed been related to the Real exchange rate (RER) and structure of the economy. The model is quite simple, and its structure allows us to concentrate on the problem, (Edwards, 1986).

2.5. Real Exchange Rate

The real exchange rate is usually defined as the ratio of the domestic price of non-tradable goods to the price of tradeable. From the below figure, the Iraqi Real exchange rate (RER) is depicted from 1997 to 2016. During the period of the study, the Real exchange rate (RER) is gradually increase due to increase oil revenue which led to increase GDP per capita (Y) and government expenditure (GE) which led to increase the price of non-tradable goods compare to tradable goods since, the price of Non-tradable goods is easily affected by increase GDP per capita (Y) and government

expenditure (GE) (due to its price determined endogenously), while the price of tradable goods is determined exogenously, this means it cannot be easily affected by increasing GDP per capita and real government expenditure. However, in 2003 when Iraq faces war and oil revenue decline sharply, thus, from the below figure the Real exchange rate (RER) is declined due to decline the price of Non-tradable goods sector against the price of tradable goods.

Figure 2. 1. Real Exchange Rate



Resources:

1.Central Bank of Iraq Statistical and Research Department / Annual Statistical Bulletin, various issues., 2017

2. World Bank, World Development indicator, (2017)

After 2004 the price of crude oil increased sharply, the Real exchange rate (RER) does also increase, until 2009 when the oil price reached the highest level. While the international oil price declined in 2009 due to the global financial crisis, Real exchange rate (RER) again depreciate. However, the depreciation Real exchange rate (RER) has been larger after declining oil price sharply after 2014. In summary high oil revenue lean to a higher the price of non-tradable goods against the price of tradable goods while during the slumping period of oil the price of tradable goods against non-tradable goods increases (Corden W. , 1981).

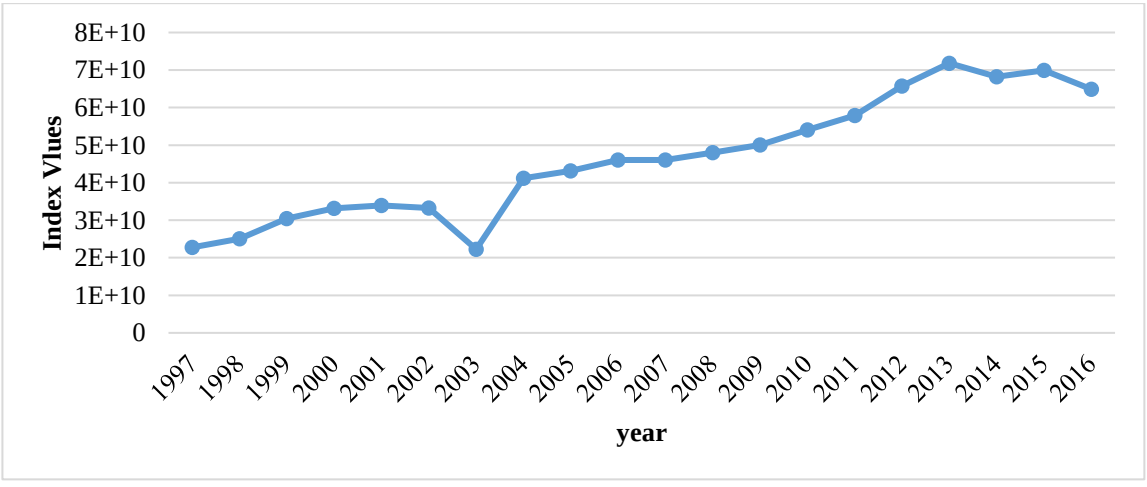
2.6. Tradable and Non-Tradable Sector

The distinction between the tradable and non-tradable goods sector of the economy has become a more important element in various branches of macroeconomics and international economics. Simultaneously, the empirical study in the tradable and non-tradable sectors was always covered behind theoretical developments. Below the economic sector will be divided into non-tradable and tradable goods sectors.

2.6.1. Non-Tradable Sector

Non-tradable, broadly defined, as those goods and services that are produced and consumed domestically. In other words, non-tradable activities could be defined as those sectors which do not export or import at all or have a negligible contribution to both total exports and imports. Looking at the components of the Iraqi real GDP, one finds it difficult to separate the tradables from the non-tradable sectors. Given the above definition, services, construction, and utility (electricity, gas, and water) might be labeled as the non-tradable sector. The trend of non-tradable goods output increases over the period of the study, except in 2003 and after 2014 when the international oil price declined sharply. This proved that there is a positive relationship between oil price and output of non-tradable goods, Edward sand Aoki (1983).

Figure 2. 2. Output of Non-Tradable Goods

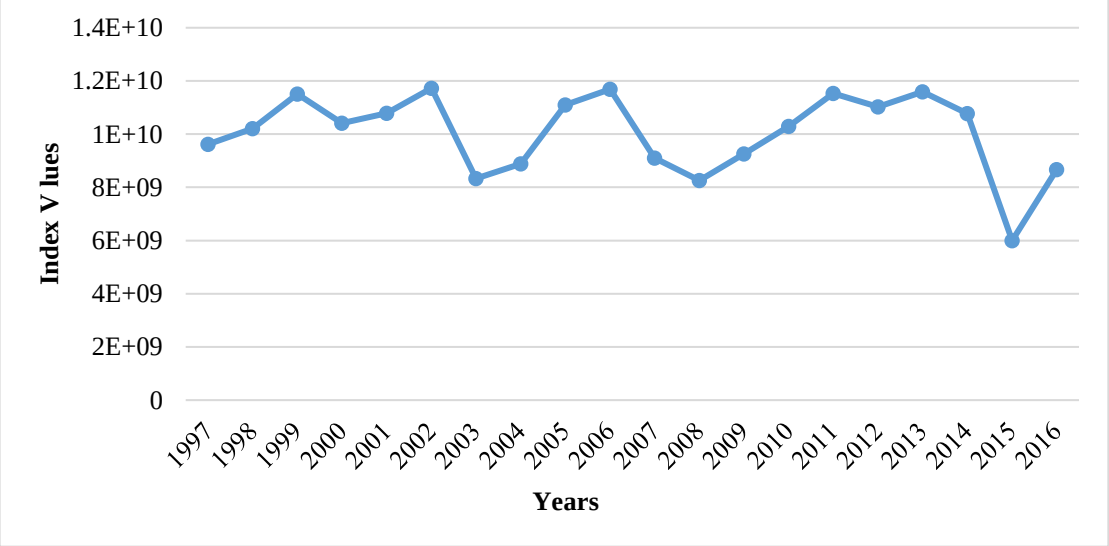


Source: World Bank, World Development Indicator (2017)

2.6.2. Tradable Goods

By definition, tradables include those goods which are actually traded, as well as those which are potentially traded. Tradables are derived residually, i. e., the remaining sectors after excluding the booming sector and non-tradable. Therefore, agriculture, manufacturing, and non-oil minerals are labeled as the tradable sector. The trend of the output of tradable goods has fluctuated over the last two decades. In general, the tradable goods output increased while due to supporting the Iraqi government to manufacturing and agriculture sectors, these two sectors in some periods of time is boomed while when stopped supporting them the output declined (Edwards, 1986).

Figure 2. 3. Output of Tradable Goods



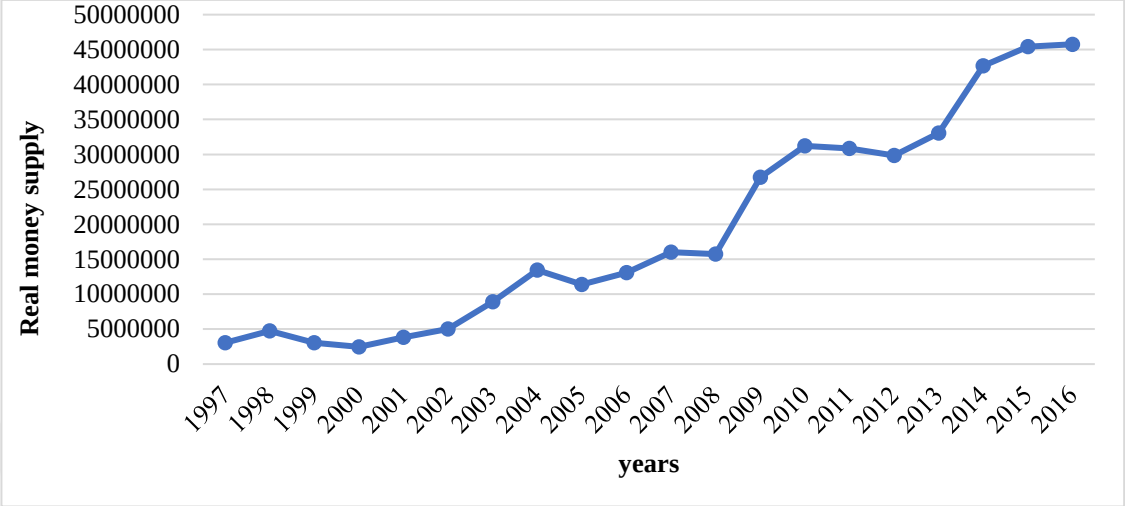
Source: World Bank, World Development Indicator (2017)

2.7. Money Supply

One of the most important variables that have a significant role in macroeconomics is the volume of the money supply, particularly for oil exporting countries. In most of oil-exporting developing countries the role of money supply is very important since all oil revenue goes to central bank and uses this revenue to support domestic currency against foreign currency, in addition, to increase money supply, since the oil revenue gives the monetary authority to increase money supply which depends on oil revenue, in other words, the increase money supply depends on

the size of oil revenue, if the oil revenue increases the money supply will increases (Kamas, 1986).

Figure 2. 4. The Real Money Supply During (1997-2016)



Source: Central Bank of Iraq / Statistical and Research Department / Annual Statistical Bulletin (various issues)

The figure 2.4. shows how the money supply is changed during the period of the study, it can be seen that during the whole period the money supply increases but at a different level. The money supply starting to increase in 1997 when the oil for food program[1] implemented by the United Nations Security Council. After 2003 when the economic sanction removed, the Iraqi government was able to export oil without any restriction, then after the money supply is increased by the central government which can be seen from the figure 2.4. during 2007 and 2008 it is noticed that the money supply did not increase same as previous years, the main reason was related to a sharp decline in the international price of oil in 2008, thus the Iraqi economy received less oil revenue which in turn led to increasing the money supply in smaller volume. In contrast when oil revenue increased sharply after increasing the international price of oil in 2009 the money supply started to increased sharply (see figure 2.4.). In the rest of the figure, the trend of money supply increased due to increased oil revenue. One can conclude that in the Iraqi case the money supply mainly depends on oil revenue.

[1] Oil for food program is an agreement between United Nations and Iraqi government which allowed the Iraqi government to export limited amount of oil to import some basic important goods and medicine to eradicate poverty.

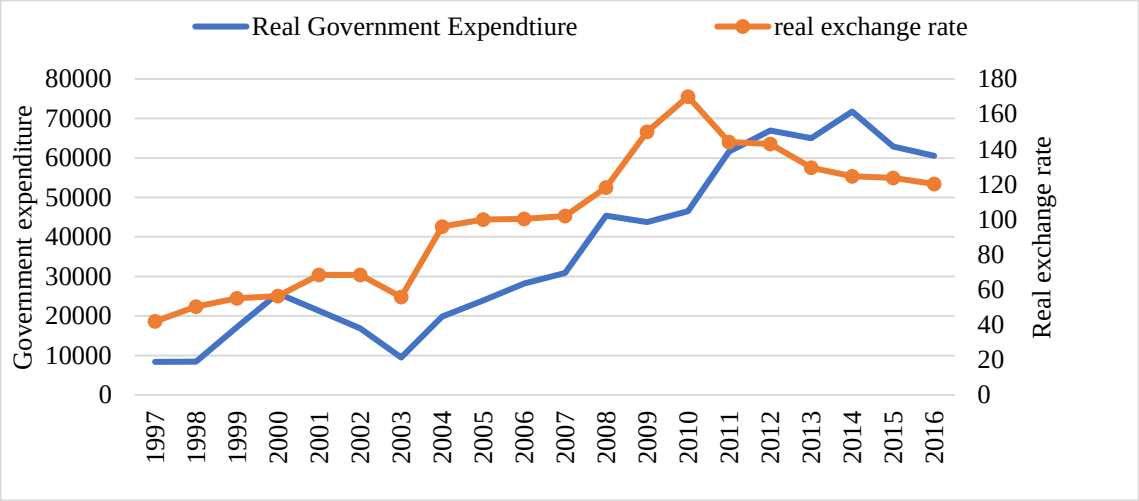
2.8. Oil Price, Real Exchange Rate, and Structural Change

In the following sub-sections, we will analyze how export booms (oil sector, in our case) affect a country's real exchange rate, and how the real exchange rate, in turn, affects the output of tradable and non-tradable goods sector. These are important and integral points in understanding the Dutch disease phenomenon.

2.8.1. Real Government Expenditure and Real Exchange Rate

Figure 2.5. demonstrates the relationship between real government expenditure and real exchange rate. As the figure displays, there seems to be a negative relationship between both variables, as when the real government expenditure increases, the real exchange rate declines (appreciates). For instance, during 1997, real government spending increased rapidly, while the real exchange rate appreciated (declined). Decreasing real government expenditure began in 2000 up until 2003, and the real exchange rate has increased (depreciated) sharply, Foote et al (2004).

Figure 2. 5. Correlation between RER and Real Government Expenditure



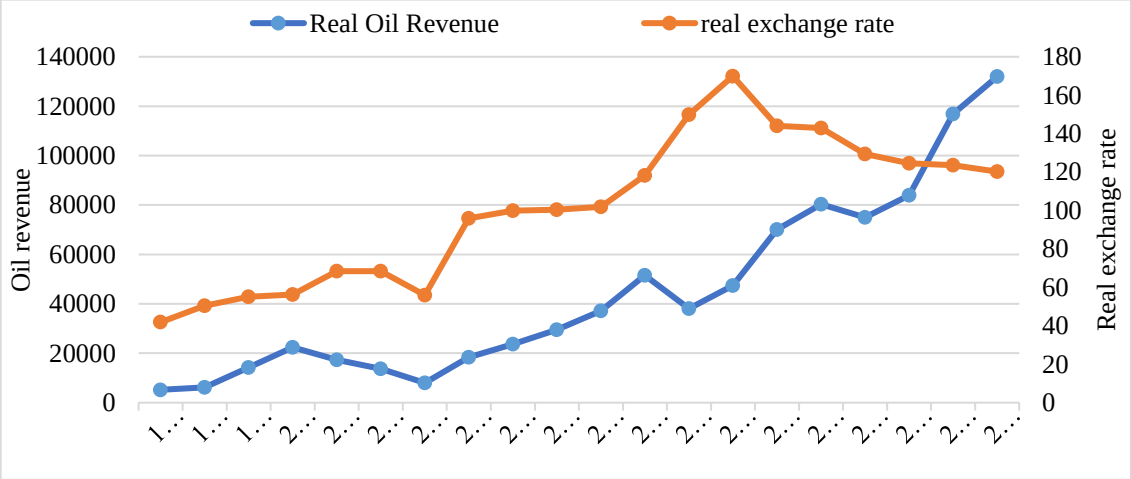
Source: Authors' calculations using data from the World Bank and Central Bank of Iraq

Again, after increasing real government expenditure, the real exchange rate started to decrease (appreciate) after 2004 because the real government expenditure increased again after the removal of economic sanctions, completely. This is in line with Dutch disease theory, that high government expenditure is associated with appreciating (decreasing) real exchange rates and vice versa, Foote et al (2004).

2.8.2. Oil Revenue and Real Exchange Rate (RER)

Terms of trade are important and the most frequently used variable in exchange rate analysis. Terms of trade are defined as a ratio of the price of exports to the price of imports. In empirical works, it is common practice to employ a commodity price as a proxy for terms of trade in cases when a commodity makes up a significant share of a country's exports. However, in Iraq's case, as long as crude oil makes up a significant share of exports, so the real oil price is employed as an approximation for terms of trade. Many papers have previously suggested (see literature review in Chapter Two) that the oil price is considered a fundamental variable, which explains the long-running behavior of RER when taken in terms of trade, Foote et al (2004).

Figure 2. 6. Correlation between Real Oil Revenue and RER (1997-2016)



Source: Authors' calculations using data from the World Bank and Central Bank of Iraq

Figure 2.6. shows the relationship between the real oil revenue and the real exchange rate. During the first and second positive oil shocks in the 1970s, the real oil revenue increased sharply, which brought about appreciation of the real exchange rate in the same period, Foote et al (2004). However, with declining oil revenues, due to a decrease in international oil prices and the Iraq-Iran war, which caused oil production to decline, the real exchange rate began to depreciate (Alnasrawi, 1994). Furthermore, the economic sanctions during the 1990s led to the oil revenues being close to zero; this reflected a sharp depreciation in the real exchange rate. However, increasing oil revenue after 1996 under the Oil for food programme (OFFP) followed the real exchange rate to appreciate again. As a result of some political instability during 2002 and 2003, the oil

revenue again declined, which led to a depreciating real exchange rate again. More interestingly, after the lifting of economic sanctions was completed in 2003, the international oil price started to increase, while the real exchange rate started to decline (appreciation) to the lowest level in 2013.

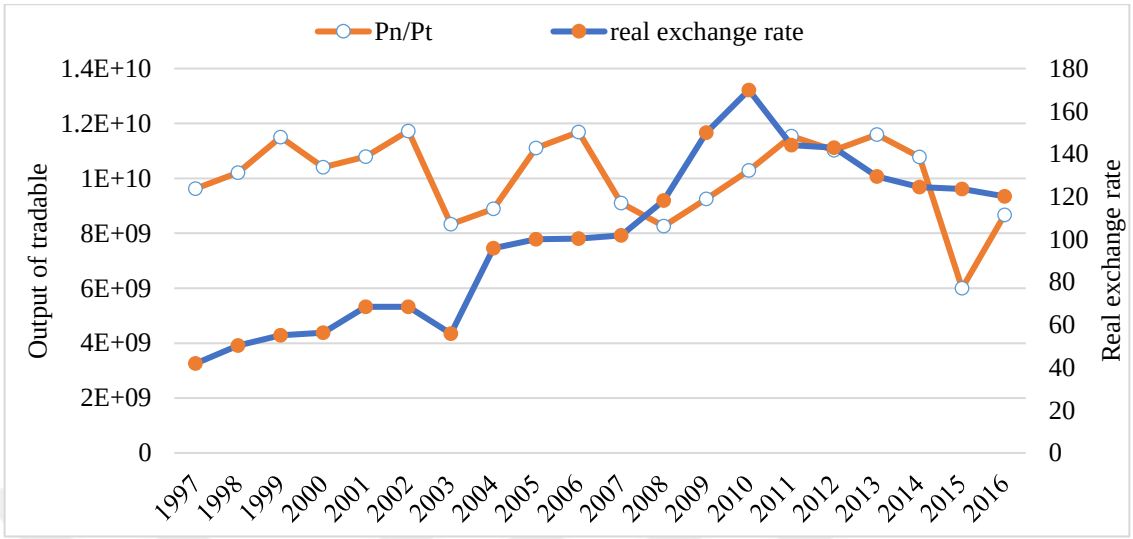
To conclude, it is found in the above analysis that, to a large extent, the appreciation of real exchange rates is caused by increased real government expenditure and real oil prices. Conversely, a depreciation of the real exchange rate is caused by a decline in real government expenditure and real oil prices. In the following sub-section, the effect of appreciation and depreciation on real exchange rates during the output of tradable and non-tradable goof sector will be analyzed.

2.8.3. Real Exchange Rate and Output of Tradable and Non-Tradable

We have established the fact that an appreciating real exchange rate did take place during periods of high oil prices and high real government expenditure. Conversely, during the period of low oil prices and low real government expenditure, the real exchange rate appreciates. This section seeks to investigate whether relationships exist between the real exchange rate and the output of tradable and non-tradable goods sectors. According to the Dutch disease theory, a positive relationship should exist between the real exchange rate and the rate of growth of tradable goods sectors. This would mean that when the real exchange rate appreciates (decreases), and the output of tradable goods sector shrinks, an appreciation (increase) of real exchange rate results in an increase in the rate of growth of tradable goods (IMF, 2016). On the other hand, the relationship between the appreciation (depreciation) of real exchange rates will be analyzed in this section. Here, it is expected that there is a negative relationship between the growth rate of non-tradable goods and real exchange rate.

As Figure 2.7. shows, during 1997-2016, when the real exchange rate appreciated, the output of tradable goods (manufacturing and agricultural sectors) fluctuated slightly and, during some periods, increased. During that time, the Iraqi government attempted to protect domestic producers via subsiding domestic producers (particularly the agricultural sector). This action at least protected the tradable goods sector from collapse, Foote et al (2004).

Figure 2. 7. Correlation between the Output of the Tradable Goods Sector and RER (1997-2016)

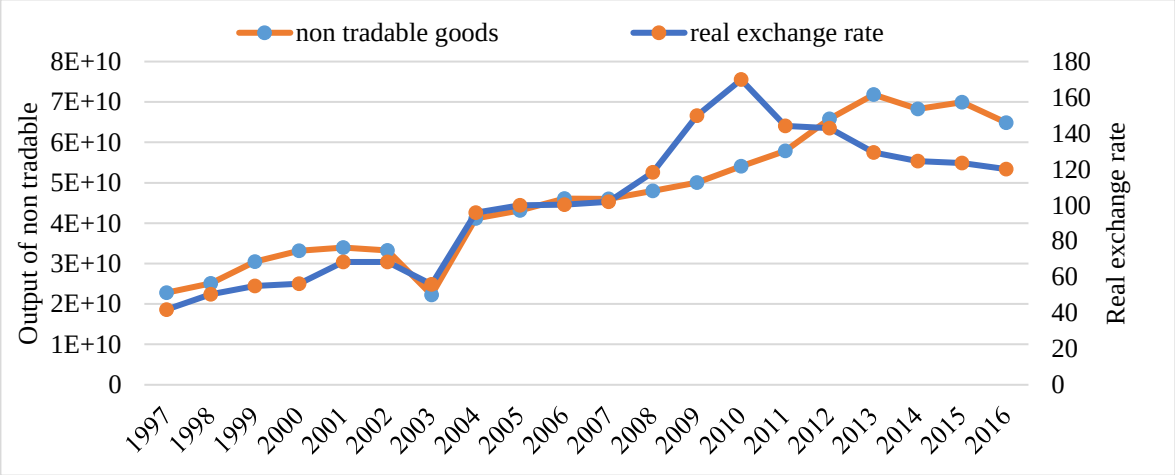


Source: Authors' calculations using data from the World Bank and Central Bank of Iraq

When the real exchange rate began to appreciate again in 1997 (due to OFFP), the output of the tradable goods sector began to decline. However, after 2003, the situation was different when the real exchange rate continued to appreciate, but the output of tradable goods increased instead of decreasing (the opposite of what the Dutch disease predicts). This was because the Iraqi government subsidies financed the agricultural and manufacturing sector via development plans, Ministry of Planing of Iraq (2010). This occurred after the government gained a huge amount of oil revenue after 2003. Despite a rapid increase in tradable goods output, its percentage to GDP is relatively small compared to other sectors, particularly the service sector.

On the other hand, the correlations between the real exchange rate and non-tradable goods output are shown in Figure 2.8. From 1997 the OFFP was introduced by the UN, the real exchange rate appreciated sharply. As a result, the output of the non-tradable goods sector gradually increased, except in 2003, as a result of the Iraq-US war. After the war, the situation was different, particularly when the UN decided to lift economic sanctions on Iraq. The real exchange rate declined (appreciate) sharply, which led to a significant increase in the output of the non-tradable goods sector.

Figure 2. 8. Correlation between Output of Non-Tradable Sector and RER



Source: Authors' calculations using data from the World Bank and Central Bank of Iraq

In general, it can be said that there is a positive correlation between the real exchange rate and output of the non-tradable goods sector. When the real exchange rate increases (depreciate), the output of the non-tradable goods sector increase. During appreciation (decrease) of the real exchange rate, the output of the non-tradable goods sector increases. This phenomenon has been explained by the Dutch disease theory.

CHAPTER THREE

3. BACKGROUND OF THE STUDY

In this chapter, is important for this dissertation. The purpose of this chapter, therefore, is to demonstrate the structure of Iraq's economy and how it changed from a very small economy to one of the largest economies in the region in terms of GDP, government revenue and expenditure, trade balance and most other economic sectors. Therefore, this chapter is structured as follows four main points: first is about Oil, public policy, and structural imbalances in the Iraqi economy. The second point is about the oil sector in Iraq. And the third is about oil and non-oil gross domestic product**.** Also, the fourth focus is outlined in the government budget (government expenditure and government revenue).

3.1.Oil, Public Policy, and Structural Imbalances in The Iraqi Economy

The background of the Iraqi economy is introduced to demonstrate a clear picture of the relationship between empirical chapter in one hand and literature chapter on the other hand. The details of structure economy in Iraq is the main issue that can be shown, particularly the contribution of the economic sector to the gross domestic product (GDP). The Iraqi economy is dominated by oil sector particularly after the beginning of the1970s. The oil price increase sharply after Arab-Israel tension. The Arab oil-exporting country decided to impose an embargo and limited export of crude oil price to industrial economies. The crisis started in 1973 when the international oil price increase double. In that time the Iraqi dependence on oil has increased sharply compared to another economic sector, then the structure of the Iraqi economy changed toward the rentier state.

3.2. Oil Sector

The oil sector is considered as a heart of the Iraqi economy since approximately 95 of government revenue comes from exporting oil. Thus, oil in terms of discovery, level of reserve, production, oil price and also exports are very important for the Iraqi

economy. In the following sub-section, all points related to oil will be analyzed (Styan, 2006).

3.2.1. Oil Discovery

In 1925 the British government, ruling Iraq as a direct mandate after the collapse of the Ottoman Empire. The modern history of natural resource in Iraq starts with this agreement. This concession covered the whole of the Baghdad, Mosul, and Basra province provinces, constituting most of Iraq (Styan, 2006). At the time the shareholders in the TPC were the Anglo-Persian Oil Company with 45 per-cent, Royal Dutch-Shell with 22.5 percent, the Compagnie Francaise des Petroles with 25 percent, and Calouste Gulbenkian with 5 percent. In 1927 however, the oil sector was struck at Baba Gurgur, just outside Kirkuk, this was transforming Iraq into one of the most valuable concessionary areas in the Global Market (Shwadran, 1977). By the end of 1930 twenty producing wells had been completed. In July 1928 the Americans were allowed into the concession, taking some of Anglo-Persian's share to hold a 23.75 percent stake,6 and in 1929 the Turkish Petroleum Company (TPC) reorganized itself as the Iraq Petroleum Company (IPC), Anderson and Stansfield (2004).

According to John Blair's book 'Control of Oil', the United States and the UK-based companies in the TPC consortium deliberately held down production in their Iraq concessions in order to enlarge their profits, during an era in which the Great Depression had resulted in a global glut of oil and low prices. These postponing tactics were employed in drilling and development activities, as well as negotiations over pipelines and export routes. Although the 1925 concession covered most of Iraq, the IPC limited its production to fields constituting only one-half of 1 percent of the country's total area. By 1950 the only field being developed was Kirkuk and only then did commercial production in substantial quantities begin until this year, eighteen years after the first exploration of the area (Styan, 2006).

In 1960, the same year in which the Organisation of Petroleum Exporting Countries (OPEC) was established in Baghdad, the Iraqi government revoked the IPC's concession for 99 percent of Iraqi territory, limiting their concession area to plots in operation at the time.

3.2.2. Oil Production

As has been explained in the previous section, the daily set of oil prices and level of oil production were managed by international oil companies in the first half of the 20th century. These international oil companies unilaterally determined the price of oil and its size of production without consulting the oil-producing developing nations (host countries). For this reason and also some other factors such as political factors, the oil exporting developing countries tried to take control of their role in determining the level of production at the beginning of the 1960s when they established oil petroleum exporting countries (OPEC), Ministry of Natural Resources (2017).

Currently, the Iraqi Ministry of Oil controls all oil production in Iraq (except oil production in Kurdistan since 2004). However, the oil fields are operated by international oil companies (except Kirkuk's field) under contracts known as "technical service" contracts. The technical service contracts specify the initial oil production target and also the maximum remuneration fee per barrel, in addition to compensation of the international oil companies for investment and operating expenses and pay fees of about 2–3 US dollars per barrel, Ministry of Natural Resources (2017).

Table 3.1. classifies all Iraqi oil fields, demonstrates the contributions of the international oil companies in oil production and the production capacity of each oil field. In the table, all oil fields in Iraq are divided into four regions: southern fields, central fields, northern fields and Kurdistan region fields. According to 2013 data, the Rumaila field in the southern region has the highest level of production at 1.430 million barrels per day. The Rumaila oil field is operated by two international oil companies: China National Petroleum Corporation (CNPC) and British Petroleum (BP). West Qurna-1 is the second largest oil field in Iraq. It is located in the southern fields. Its daily level of production is about 550 thousand barrels, which consist of about one-sixth of the total production in the southern fields. Three international oil companies (Exxon Mobil, PetroChina, and Shell) have developed this field. Apart from these two fields, there are six other oil fields in the southern region. Thus, the total oil production in southern fields is about 3.320 million barrels per day. The central oil fields have the lowest production level (180.000 barrel per day) compares to other regions. All fields in

the central region are operated by Gazprom Neft, Kogas, Petronas and CNPC, Ministry of Natural Resources (2017).

The northern fields, on the other hand, consist of Avana & Baba, Bai Hasan, Jambur, Khabbaz and some other small fields. The total production capacity is about 525 thousand barrels per day – three times more than the total oil production in the central region. More interestedly there are other fields that have been developed since 2004. They are located in the Kurdistan region in the very north of Iraq. The most productive fields in Kurdistan are Khurmala Dome, Tawke, Taq Taq and Shaikan. The main international oil companies contributing to oil production in Kurdistan are DNO, Genel Energy, Gulf Keystone, and Sinopec. The total production in Kurdistan fields was about 427 thousand barrels per day in 2015 (Ministry of natural resources in Kurdistan). It is important to mention that the production policy and contract type has been done without any consulting of Iraq's central government. Thus, there have recently been some conflicts between the central government and Kurdistan's regional government. Thus, Kurdistan exports its crude oil without consulting the central government at the moment.

The previous analysis has concentrated on only the name and location of Iraqi oil fields and the contributing international oil companies in these fields. The level of production has not yet been discussed. In the following analysis will follow the level of oil production in the last five decades.

Table 3. 1. Iraq's Oil Fields, Lead Foreign Partner, and Production Capacity (2014)

Southern fields		
Main oil fields	**Lead foreign partner**	**Production capacity (000 bbl/d)**
Rumaila	BP, CNPC	1.430
West Qurna-1	Exxon Mobil, PetroChina, Shell	550
West Qurna-2	Lukoil	220
Zubair	Eni, Occidental	360
Majnoon	Shell, Petronas	200
Garraf	Petronas, Japex	100
Missan fields	CNOOC	135
Halfaya	CNPC, Total, Petronas	110
Other fields	NA	215
	Total southern capacity	3,320
Central fields		
Main oil fields	**Lead foreign partner**	**Production capacity (000 bbl/d)**
Ahdab	CNPC	140
Badra	Gazprom Neft, Kogas, Petronas	15
Other fields	NA	25
	Total central capacity	180
Northern fields		
Main oil fields	**Lead foreign partner**	**Production capacity (000 bbl/d)**
Kirkuk (Avana & Baba)	NA	220
Bai Hasan	NA	185
Jambur	NA	40
Khabbaz	NA	30
Other fields	NA	50
	Total northern capacity	525
Northern fields (Kurdistan Regional Government - KRG)		
Main oil fields	**Lead foreign partner**	**Production capacity (000 bbl/d)**
Khurmala Dome	NA	110
Tawke	DNO, Genel Energy	130
Taq Taq	Genel Energy, Sinopec	130
Shaikan	Gulf Keystone	21
Other fields	NA	36
	Total KRG capacity	427
	Total Iraq (Baghdad) capacity	4025
	Total Iraq capacity	4452

Source: U.S. Energy Information Administration based on information from the Energy Intelligence

Group, Iraq Oil Report, and the Middle East Economic Survey (Note: This is the latest information available prior to the June 2014 attack by the Islamic State of Iraq and the Levant).

By looking at Iraqi's oil production since 1997, One can see that the level of oil production has fluctuated over the last two decades. These fluctuations are mostly due to political and economic factors. Table 3.2. illustrates total crude oil production, daily average export and daily domestic consumption of oil from 1997 to 2016. It is noted from the table that the growth pattern of both oil production and oil exports tend to move exactly in the same direction. More interestingly, the volume of export crude oil to total crude oil production has been over 90 percent during the last Two decades. This means that a negligible amount of crude oil production has been used in the domestic economy.

Table 3. 2. Iraqi Oil production, Exports, and local Consumption 1997-2016 (Thousands of Barrels)

Years	Total oil production	% change	Daily average exports	% change	Domestic Consumption	% change
1997	1252.3	118.4	776.6	708.3	475.7	0.08
1998	1902.6	51.9	1417.3	82.6	485.3	2.1
1999	2582.1	32.4	2070.9	42.1	511.2	5.3
2000	2581.9	2.4	2039.8	-1.5	542.1	6
2001	2308.8	-10.6	1751.2	-14.2	557.6	2.7
2002	2039.7	-11.7	1494.6	-14.7	545.1	2.2
2003	1318.1	-37.1	988.6	-33.9	330.5	39.5
2004	2020.5	53.2	1490.1	50.2	530.4	60.6
2005	1999.4	-1.1	1472.2	-1.3	527.2	0.6
2006	2009.4	0.5	1467.8	-0.4	541.6	2.6
2007	2195.6	9.3	1643.1	11.9	552.5	2.03
2008	2394.5	9	1835.2	11.6	559.3	1.2
2009	2499.2	4.3	1910.1	4	589.1	5.3
2010	2402.8	-3.9	1812.3	5.2	590.5	0.1
2011	2658.9	10.6	2052.1	13.2	606.8	2.7
2012	2986.3	12.3	2301.2	12.1	685.1	13
2013	3157.6	5.7	2479.3	7.7	678.3	-1.1
2014	2854.5	-9.6	2315.4	-6.7	739.1	8.9
2015	3125.3	9.4	2474.1	6.8	751.2	1.6
2016	3270.8	4.6	2491.1	0.6	779.7	3.7

Source: US Energy Information Administration

Nonetheless, in the period during which economic sanctions were imposed, the Iraqi government reportedly conducted illicit oil deals with its neighbors in order to make funds that it could use without restriction. In spite of that, the level of production

was low until 1996, at which point Iraq agreed to the Oil for Food program, Ministry of Natural Resources (2017).

However, in 1997 when the oil for food program was introduced by the UN, the level of oil production has increased sharply. Under this programme, Iraq's government was allowed to export a limited amount of oil to buy and import food and medicine for Iraqi people. At that time, the volume of export gradually increased again from 776 thousand barrels per day in 1997 to more than two million barrels per day in 2000. Nevertheless, the crude oil exports started to decline again in 2001 and 2002 due to frequent disputes with the United Nations over pricing and other aspects of program administration and overproduction techniques that allowed water intrusion into oil-bearing geologic zones that generally deteriorated infrastructure, Ministry of Natural Resource (2017).

Moreover, since most spare parts for the oil industry are made in industrial and Western countries, the oil sector in Iraq suffered severely during sanctions from a lack of appropriate maintenance. Thus, the capacity of oil production and exports were seriously curtailed. Therefore, it can be said that the oil sector, which is the crucial engine of Iraq's economy suffered badly through vast losses in terms of production level and revenue. Since 2003, after lifting of UN sanctions, oil production increased gradually, except in 2003 during operation Iraqi freedom). It ranged from 1999 Mb/d in 2005 to 3157 Mb/d in 2013. This increase can be mainly attributed to the lifting of the UN sanctions in 2003. The nominal oil price has experienced a sharp increase since the early 2000s, except in 2008 when the global economy faced a financial crisis. These factors have allowed major international oil companies to return to Iraqi and raise their oil exploration efforts. The volume of crude oil exports increased from 1.490 Mb/d in 2004 to 2.479 MB/d in 2013 (EIA, 2015). In summary, it can be said that the volume of production and export of crude oil has increased considerably during the last two decades. These sudden and sharp fluctuations during the last two decades have severely affected Iraq's economy since oil's contribution to GDP is relatively high and the oil revenue's contribution to total government revenue is more than 90 percent (EIA, 2015).

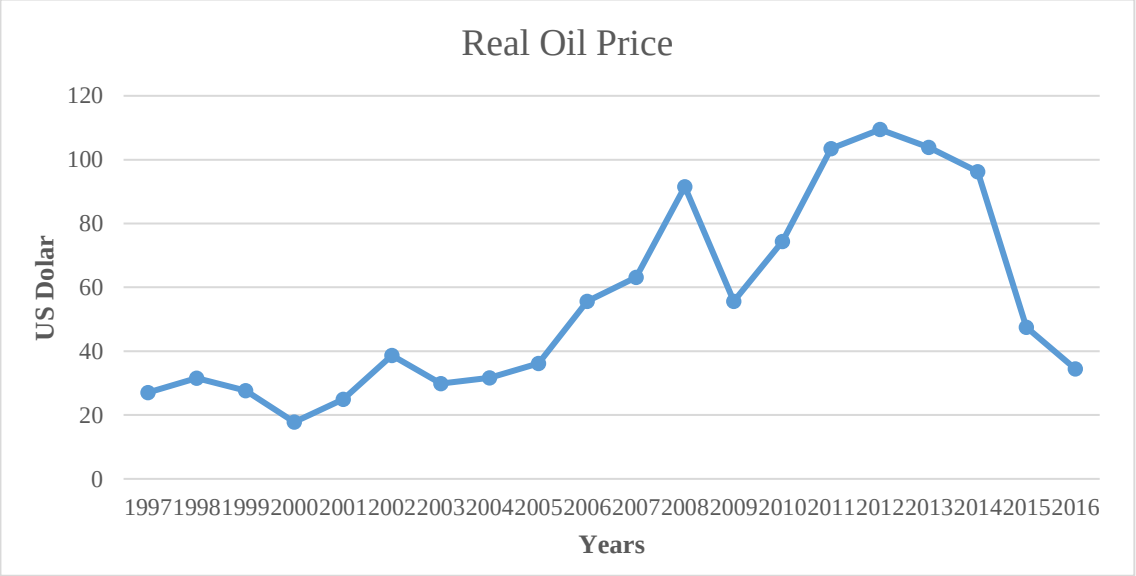
3.2.3. Oil Prices

The international crude oil price significantly affects the domestic economy of oil-exporting developing countries, particularly for those countries whose contribution oil sector to GDP is very high. Oil price is affected by several factors. Some of these factors are related to political factors others related to economic or substitute factors. The political instability in the area of oil production is very effective or low and high economic growth is also another factor affecting the international price of oil. Figure 3.1 shows the price of oil during the last two decades, it shows a sharp fluctuation from 20 US dollars to over 100 US dollars. In 1997 was just over 20 US dollars and even in the following years, the price declined due to the Asian financial crisis. After 2004, the price of oil started to increase due to economic factors such as increasing demand for oil by some new economies such as China and India. The price of oil increased from 35 US dollars in 2005 to nearly 80 US dollars in 2008. This was the sharpest increased that has ever happened during the period of this study. However, after the global financial crisis, the international price of oil declined sharply due to a decrease in demand for oil while the supply side of oil remains the same as before. However, The industrial countries tried to limit the losses of the economy due to the global crisis they implemented some economic policy and then went to the right way and the demand on oil get back to the previous global crisis, in that case the international price of oil started to increase again and reach over 100 US dollars (see figure 3.1.). On the other hand, due to the US high production of oil, from mid-2014 the international price of oil decreased. These all fluctuation of oil price during the last two decades, one can conclude that the price of oil cannot be stable at least medium period. In addition, the sharp fluctuation of oil price can be harmful to oil exporting countries particularly developing one (Kaufmann, 1995).

The last two decades have demonstrated that a huge annual price movement can occur in either direction. For instance, in Figure 3.1. it can be seen that oil prices have been dramatically increasing over time. For example, in 1997, the price of oil was about US$ 23 p/b, and then decreased to below US$20 in 2000, but it increased again in 2003 to about US$40 and decreased again in 2003 to US$ 29. The average price increased again by approximately four times from $27.69 in 2003 to $107.32 in 2013. Therefore,

it can be said that oil prices have been extremely changeable, twice as volatile as those of other commodities, even when fluctuations are measured as a deviation from recent trends. Furthermore, the fluctuation of oil prices has also been very poorly predicted and it was very hard to separate out temporary fluctuations from trends (Kaufmann, 1995).

Figure 3. 1. The International Crude Oil Price



BP Statistical Review of would energy, January 2017

3.3. Oil and Non-Oil Gross Domestic Product

In all economies, the measurement of GDP is conserved as the main tool to have a knowledge about how the economy is relatively goods or strong. The contribution of each sector to GDP is also important, since balancing contribution economic sector to GDP is the guarantee to protect the economy from severe crisis particularly for oil exporting developing countries. In the following sub-section, the GDP will be divided into oil and non-oil sector.

3.3.1. Contribution Oil Sector to GDP

One of the problems in oil-exporting developing nations is a high contribution of the oil sector top total GDP. Table 3.3 shows the contribution of the oil and non-oil GDP to total GDP. Table 3.3. shows that the contribution of the oil sector to GDP is over 50 percent during the whole period of this studies. But the level of percentage is

different from time to time. For example, in 1997 the percentage of contribution oil sector to GDP is around 68 percent while with increasing oil production and price, its contribution has increased to nearly 83 percent in 2000. This tells us that the factor of the oil price and its production can significantly affect the contribution of the oil sector in the domestic economy. After 2003, although the size of the oil sector increased its contribution decreased, this is as a result of the sharp increase of GDP in the non-oil sector. During low oil price (2014-2016). The contribution of oil to GDP declined below 54 percent. This sharp decline does not relate to increase non-oil GDP but it is related to decrease international oil price. One can conclude that the oil sector dominated the whole Iraqi economy during either period (high or low oil price).

Table 3. 3. Oil and non-oil Contribution to Real GDP (Constant 2005 Price / Million US Dollars)

Years	Real GDP	Oil Sector	%	Non-Oil sector	%
1997	30294	20776.3	68.58	9517.7	31.42
1998	40354	32049.7	79.42	8304.3	20.58
1999	47537	39099.7	82.25	8437.3	17.75
2000	48713	40911.4	83.98	7801.6	16.02
2001	49806	40611.6	81.53	9194.4	18.47
2002	46397	35237	75.94	11160	24.06
2003	31039	22311.4	71.88	8727.6	28.12
2004	47849	31099.8	64.99	16749.2	35.01
2005	49955	28892.1	57.83	21062.9	42.17
2006	55029	30521.2	55.46	24507.8	44.54
2007	55787	32799.4	58.79	22987.6	41.21
2008	59474	36800	61.87	22674	38.13
2009	62930	38029.2	60.43	24900.8	39.57
2010	66415	38565.7	58.06	27849.3	41.94
2011	73198	43390.7	59.27	29807.3	40.73
2012	80731	48824.1	60.47	31906.9	39.53
2013	84132	49011.2	58.25	35120.8	41.75
2014	82251	47621.7	58.4	34629.3	41.6
2015	78511	45654.3	59.9	32856.7	40.1
2016	77926	45518.5	57.7	32407.5	42.3

Source: Central Bank of Iraq, Statistic Department, various issues.
(Ministry of Finance, Budget Department, Various Issues, 2016)

3.3.2. Contribution Non-Oil Sector to GDP

In the Iraqi case, the contribution of non-oil GDP to total GDP is relatively low and among the non-oil contribution sectors, manufacturing and agriculture sectors have

the lowest contribution to GDP. Below from the table 3.4. the value added of non-oil sector and their contribution to GDP are shown.

Table 3. 4. Value added and Percentages of Contribution Manufacturing, Agricultural and Service Sectors to Real GDP (1997-2016) (Constant; 2005 / Million US dollars)

Year	GDP, million. US$	Manufacturing value added	%	Agriculture value added	%	Service and construction value added	%
1997	30294	1079.1	3.56	1394	4.60	7019.4	23.17
1998	40854	895.4	2.19	981	2.40	6016.1	14.72
1999	48037	862.8	1.79	915	1.90	6514.2	13.56
2000	48713	706.3	1.44	908	1.86	6061.3	12.44
2001	49836	717.5	1.43	909	1.82	7359.6	14.76
2002	46397	1000.9	2.15	974	2.09	8829.7	19.03
2003	31039	808.3	2.60	1010	3.25	6446.8	20.77
2004	47849	606.9	1.26	1619	3.38	13221.4	27.63
2005	49955	659.6	1.32	2040	4.08	16962.8	33.95
2006	55029	728.9	1.32	3508	6.37	19808.7	35.99
2007	55787	704.4	1.26	2194	3.93	20006.3	35.86
2008	59474	505.4	0.84	2002	3.36	20087.3	33.77
2009	62930	695.4	1.10	1528	2.42	22442.9	35.66
2010	66415	864.4	1.30	1353	2.03	24926.1	37.53
2011	73198	1014.6	1.38	1745	2.38	26640.1	36.39
2012	80731	1186.8	1.47	1788	2.21	28205.8	34.93
2013	84132	1340.1	1.59	2243	2.66	31291.5	37.19
2014	82251	1566.1	1.90	2257	2.74	30806.2	37.45
2015	78511	1554.2	1.97	2390	3.04	28911.5	36.82
2016	77926	1512.1	1.94	2378	3.05	28517.4	36.59

Source: Central Bank of Iraq, Statistic Department, various issues.
Ministry of Finance, Budget Department, various issues %: indicate the percentage of contribution of each sector to real GDP

3.3.2.1. Service and Construction Sector

The oil sector became more important to the Iraqi economy in terms of revenue and its contribution to GDP from 1997. Interestingly, from the same period, the share of services has significantly increased as well, indicating a very rapid rate of growth of these sectors (service and construction sectors) as a result of the increasing oil revenue from 1997. The service and construction sectors then became the second most important economic activity as a result of the growing oil sector. It is noted from the Table 3.4 that the share of services to GDP started to increase with the increasing oil revenue in 2001. The value-added service and construction sectors increased, from $6061.3 million

in 2000 (12% of total GDP) to about $8829.7 million in 2002 (19% of total GDP). The increasing volume and percentage of the service sector to real GDP is attributed to higher international oil prices since oil is the main export for Iraq's economy. Also, government revenue depends mainly on oil revenue; therefore, this triggered an increase in government expenditure during the 2000s which in turn led to a developed service sector via spending effect.

From 2004 however, the situation adjusted in favor of the service and construction sectors. Output increased four times from $6446 million in 2003 to $31291.5 million in 2013. Also, its percentage of GDP has also increased to 37 percent in 2013 from 20 percent just before the lifting of sanctions in 2003. The reason behind the sharp increase in the output of the service sector was strongly related to the increased oil revenue. Because the international oil price has gradually increased since 2004 and the UN sanctions on Iraqi oil were removed in 2003, there was an increase in government revenue. Subsequently, government expenditure has also increased sharply, which in turn positively affected the total demand on the service sector. Then, the service sector became the most profitable among the non-oil economic sectors, and then the output of the service sector increased.

The growth rate of the output service and construction sectors can be summarised by considering the contribution of this sector in the total real GDP. During the first boom period (1997-2003) it is noted that the contribution of the service sector to GDP was relatively low. In conclusion, the Iraqi service sector depends mainly on oil. However, in the second boom period (2004-2013), it is noted that the output of the service sector has increased sharply due to high oil revenue.

3.3.2.2. Agriculture

The importance of the agriculture sector for any country comes not only from its share to the national income so as to exceed the growth rate of the population. The encouragement of the agriculture sector to have a high growth rate is related to its contribution to real GDP. Diversifications of the economy then reduce dependence on one export product as the main source of national income. Moreover, the agriculture

sector encourages economic growth and also employment in other economic sectors through its backward and forward linkages.

In the case of Iraq, the agriculture sector was a largely agrarian economy before the discovery of oil. Unfortunately, the rapid growth in the volume and value of oil exports at the beginning of 1997 coincided with a sudden decline in the contribution of the agriculture sector to the real GDP. As shown in Table 3.4. the output of the agriculture sector was slowing down and its contribution to real GDP decreased gradually (Schnepf, 2003).

Conversely, during economic sanctions (1990-2003) almost all economic sectors reduced their total output, with the exception of agriculture. Since the shortage of foreign exchange created a rapid relative increase in the price of food, and since food demand has been maintained even with the declined real income per capita, then the agriculture sector became a highly profitable sector. Apart from that, the sharp depreciation of the nominal and real exchange rate during the 1990s was the main factor leading to agriculture's increased output and its percentage contribution to real GDP, (Schnepf, 2003). Although food imports were not prohibited by economic sanctions, the nominal and real exchange rate depreciated sharply leading to an increased price for imported products. In the absence of food imports which the country had become reliant on, there was growing pressure for Iraq's producers to increase domestic agricultural production. This led to the agriculture sector becoming a more profitable sector during low oil revenue periods.

In 1996-1997, the situation changed in favor of the oil sector when the Oil for Food Program introduced by UN removed the embargo partially. The output of the agricultural sector fell to about 915 million US dollars in 1999, and its contribution to real GDP declined to the lowest level of 1.9 percent in 1999. The shrinking agriculture sector in the second half of the 1990s was due to the appreciation nominal and real exchange rate. In other words, whenever there were signs that the sanctions might be relaxed, the Iraqi Dinar appreciated. Increased oil revenues would reduce the government's need to print money. This, combined with the relative increase in the supply of foreign currencies in the domestic economy, triggered an appreciation of the exchange rate (Corden W. , 1984).

On the other hand, during the second boom period (2004-2013) after removing sanctions, Iraq's oil was exported again without restrictions, the price of oil increased gradually (except 2008-2009) and the output and contribution of agriculture sector have gradually improved due to government subsidies. The output value of the agriculture sector increased to $3508 million. However, due to the government ignoring this sector, its contribution to real GDP declined sharply to 2.3. percent in 2010. The main reason was related to the increased high oil revenues. Although there are some other factors that made the fall in the output of the agriculture sector, the appreciation of the real exchange rate made the price of an imported agriculture goods chapter than the domestic one.

It is found from the above analyses that the increased contribution of the agriculture sector to GDP is associated with a decline of the oil price and vice versa. Meanwhile, the growth rate of the output of the agriculture sector depends on some macroeconomic adjustments such as real exchange rate, fiscal policy, and government policy (Schnepf, 2003).

3.3.2.3. Manufacture

The manufacturing sector in Iraq makes one of the smallest contributions to total GDP compared with other economic sectors, as shown in Table 3.4. although since, 1997, the manufacturing sector has grown in nominal terms, the sector is still below the declining agricultural sector in its share of real GDP. Nonetheless, the real rate of growth is still positive on average. However, there were some years of a negative rate of growth, particularly during economic sanctions.

Since-1997 the contribution and also the level of the Output of the manufacturing sector were decreasing because Iraq's government started to export limited amounts of oil under the oil for food program. Even after removing of sanctions in 2004, the total manufacturing gross output and its contribution to real GDP declined until it reached its lowest level in 2008 (0.84 percent to total real GDP). The reasons for that are related to the investors. Most investors (domestic and foreign) did not get involved in the manufacturing sector. This is first because increased oil revenue, particularly after 2004 led to the appreciation of the real exchange rate making domestic manufacturing more

expensive than imported products. Secondly, alternative profitable investments associated with high returns, short-term investment and low-risks were more attractive. The most obvious examples of these investments were real estate, house building, trading, and the services sectors. During high oil revenue periods, most government expenditure goes to these sectors, making them more profitable at the expense of the manufacturing sector. The above analysis demonstrates that the manufacturing sector did not grow many relative other economic sectors, particularly during periods of high oil revenue. In spite of this, the value of output has increased faster for the short periods of time compared to other economic sectors, but overall, the manufacturing sector has experienced very low growth despite government intervention in this sector (Schnepf, 2003).

3.4. The Public Budget and Its Distribution

The government Budget is defined as an official document containing the expenditure and revenues of the Government for a specific period of time, it is usually a one-year calendar. A budget is a financial government plan to complete the decisions related to economic, political and social activates (Aronson, 1985). In addition, the budget is also known as a comprehensive statement of government revenue and expenditure the showing the surplus and deficit (Tarnoff, 2011). Apart from that via government budget, some economic policies can be implemented to reach some economic and social and even political goals. The budget has also been defined as a dynamic process that reflects a permanent movement of the government sector and continues from year to year Many economic, social and developmental programs have been based on practical and practical, Karkhi and Majid Abdel Jafar (1999).

3.4.1. Government Expenditure

Government expenditure is one of the components of the government budget, but government expenditure is divided into two main sections. The first one is recurrent expenditure which its proportion is very high compared to total expenditure at least in developing countries. The second part is capital expenditure (sometimes is called investment expenditure) which made a smaller part in terms of proportion to total

expenditure. Table 3.5. shows the component of government expenditure which is divided into two main parts.

Table 3. 5. Components of the Budget Expenditures and its Percentage (1997-2016)(Constant; 2010/ Million US Dollars)

Year	Recurrent	% to Total Expenditure	Capital	% to Total Expenditure	Total Exp.
1997	8336.8	88	1031.1	12	9367.9
1998	8309.7	88	1070.2	12	9379.9
1999	13938.7	72	5284.7	28	19223.4
2000	17264.6	60	11400.5	40	28665.1
2001	17073.3	71	6753.5	29	23826.8
2002	14463.4	76	4376.3	24	18839.7
2003	10234.3	97	395.9	3	10630.2
2004	18232.3	83	3900.8	17	22133.1
2005	20521.3	76	6195.8	24	26717.1
2006	22048.6	70	9404.1	30	31452.7
2007	23811.8	69	10657.6	31	34469.4
2008	34111.5	67	16555.1	33	50666.6
2009	35845.2	73	13044.6	27	48889.8
2010	36246	69	15681	31	51927
2011	49087.3	71	19726.3	29	68813.6
2012	54006.2	72	20776.6	28	74782.8
2013	54423.7	75	18136.6	25	72560.3
2014	52642.3	74	17654.4	26	70296.7
2015	51832.1	75	16843.8	25	68675.9
2016	50943.5	76	15521.3	24	66464.8

Sources: Central Bank of Iraq (2017) and Ministry of Finance, Budget Department (2016).

It is noticed that in all years the size of recurrent expenditure is always larger than the size of capital expenditure. This is one of the main limitations of approaching expenditure in developing countries including Iraq. The percentage of recurrent expenditure to total expenditure is 88 percent in 1997, but when the total expenditure increases in the following years, it is noticed that the percentage of capital expenditure increases to highest level in 2000 to around 40 percent, Foote et al (2004). The reason behind increasing percentage of capital expenditure is not related to decreasing size of recurrent expenditure, but rather it is related to the government policy that most of added in total government expenditure approached toward capital expenditure rather

than recurrent expenditure. In this case, the percentage of recurrent expenditure declined despite increasing its volume.

In the rest of the table, it can be seen that the percentage of recurrent expenditure is starting to increases. In 2003 is recorded the highest level which is 97 percent. This was as a result of an invasion of Iraq (political instability). Although, after 2003 the real government expenditure has increased sharply the percentage of capital expenditure was still in the low level compare to recurrent expenditure. However, A Low percentage of capital expenditure to total expenditure does not mean the size of capital expenditure is low. The volume of capital expenditure increases with increasing the total government expenditure. Therefore, one can conclude that the recurrent expenditure in the Iraqi case made the biggest part throughout the whole period of study. While the size of capital expenditure was always smaller (Brown, 1979).

3.4.2. Oil Revenue

The reason behind discussing oil revenue here is because in Iraqi case the trend of oil revenue to some extent is different compared to oil price since Iraqi has gone through some political instability and economic sanction which affected the level of oil production. In some cases, the oil price increased but the oil revenue declined due to economic sanction. Due to the Oil for Food Program (OFFP), the Iraqi revenue from oil increased in 1996. According to this program, the UN allowed Iraq to export limited amounts of oil (partially removing sanctions) in return for basic foodstuffs and medication (Katzman, 2003). Consequently, the oil revenue increased nine times from $659 million in 1995 to $5814.2 million in 1997, in the following years the program continued until 2003 (Jaffe, 2007). However, once the sanctions were entirely removed in 2003, Iraq's oil started to be exported without any restrictions. Iraq's oil revenues increased gradually from $20492 million in 2004 to $42538 million in 2009 and $89716 million in 2012. While oil revenue has increased sharply, its percentage of total revenue has increased to around 90 percent in 2012. This means that the Iraqi economy is a rentier economy since it depends mainly on one product to export (oil), Wallensteen, Stabiano and Erikson (2005). Therefore, any shock that takes place in industrial countries may transfer to Iraq's economy.

Table 3. 6. Total Oil Revenues and Non-Oil Revenue (Constant; 2010 / Million US Dollars)

Years	Oil Revenue	Non-oil Revenue	Total Revenue	% Oil Revenue to Total Revenue
1997	5814.2	1703.5	7517.7	77
1998	6836.9	1776.5	8613.4	79
1999	15845.4	2572.2	18417.6	86
2000	25035.8	2741.5	27777.3	90
2001	19315.8	2775.8	22091.6	87
2002	15266.1	2503.2	17769.3	85
2003	8912.6	1142.7	10055.3	88
2004	20492.5	1676.3	22168.8	92
2005	26404.4	2820.5	29224.9	90
2006	32953	3921.1	36874.1	89
2007	41470.5	4660.9	46131.4	89
2008	57569.8	4634.5	62204.3	92
2009	42538.4	6288.4	48826.8	87
2010	52975	6653	59628	88
2011	78168.1	7391.2	85559.3	91
2012	89716.4	7476.3	97192.7	92
2013	83801.2	7257.9	91059.1	92

Sources: Central Bank of Iraq (2017) and Ministry of Finance, Budget Department (2016).

As the price of oil has been extremely unstable over the past four decades, it has resulted in highly volatile revenue. Iraq’s dependence on oil for government finances has meant that throughout periods of sudden oil price decline, the Iraqi government has desperately had to decrease the size of the budget or face large budget deficits. Moreover, the government has also been forced to allocate the burden of budget cuts.

The objective of this chapter was to give a wide overview of the background of Iraq’s economy during the last five decades. From the previous sections, it is evident that oil export has made a significant contribution to the Iraqi economy. This contribution, as we have analyzed took the form of periodic injections of purchasing power into the domestic economy. However, changes in the country's earnings were mostly influenced by crude oil revenues, reflecting global prices of oil and daily level of oil production. Then the fluctuating oil price and production levels disturb this injection and also disturb the whole Iraqi economy. The fluctuation of oil price and production was considered as an exogenous variable since these changes were determined by

international factors. This high reliance on exporting crude oil caused economic difficulties as Iraq experienced some extraordinary cycles of booms and slumps during the whole sample period. Therefore, the fluctuating oil price has made two types of a period: high oil prices created boom periods while low oil price created slump periods (Jaffe, 2007).

CHAPTER FOUR

4. METHODOLOGY AND EMPIRICAL ANALYSES

The aims of this chapter are investigating empirically analyses the outcomes of the fluctuation oil revenues on the Real exchange rate (RER) from 1997 to 2016. To achieve this objective, the researcher is going to employ some econometrics technic. Before conducting the main test, the time series data is required to implement a stationarity test after converting data to the stationarity then the regression will be run.

The Vector Error Correction Method is implemented in this chapter, the first test is used to find the relationship between Real exchange rate (RER) as a dependent variable and Real Money Supply (MS), Real Government Expenditure(GE) and Real Oil Revenue (OR) as independent variables. Therefore, after conducting Real exchange rate (RER) model Test will be run. This chapter is divided into five sections.

4.1. Data and Methodology of the Study

Different methods have been employed in economic literature to estimate equations, one of the common methods that researchers depend on is the Vector Error Correction (VECM). The key condition for the VECM regression to be unbiased and consistent is that there is no correlation between the error term and independent variables. The data for this study were mainly secondary data collected from various sources such as the Central Bank of Iraq; Annual Report and Statement of Account (various issues), and the Federal Ministry of Finance. The data series used in the study for analysis include Real exchange rate (RER), Real Oil revenue (OR), Real Government Expenditure (GE), Real Money Supply(MS).

4.2. Stationarity Test

Before beginning to conduct any empirical estimations of the model, it is required to examine the time series data to check whether they are stationary or non-stationary, Clarke and Mirza (2006). In this regard, the stationarity test will be implemented for all data via Augmented Dicky Fuller (ADF) test as an initial test. All variables were tested with intercept and intercept plus trend. The unit root test results are demonstrated in

Table 4.1. The first stage of the empirical analyses involved testing the statistical properties of all the variables under consideration, i.e., Real Exchange Rate (RER), Real Government Expenditure (GE), Real Oil Revenue (OR) Real Money Supply (MS), The Outcome of the ADF unit root tests is summarized in Table 4.1. The results suggest that the null hypothesis of the presence of unit roots in the variables in levels could not be rejected, indicating that all the variables are non-stationary in levels.

However, after converting to the first difference, the variables become stationarity, this, means the null hypothesis of the unit root in each of the variables was rejected at the 5% level of significance. Thus, it can be said that most of the variables are integrated of order 1, that is, I(1). Thus, the evidence of the outcome suggests that first differencing is sufficient for modeling VECM series considered in this study.

Table 4. 1. Stationary Model of the Study by ADF

In Levels					**In 1st Difference**			
Intercept			Intercept and trend		Intercept		Intercept and trend	
Variables	t-statistics	Prob	t-statistics	Prob	t-statistics	Prob	t-statistics	Prob
RER	-0.107001	0.935	-2.597257	0.285	-4.556705	0.0024	-3.328844	0.003
OR	-1.196941	0.6532	-3.720391	0.0491	-3.929886	0.0086	-3.837675	0.0385
GE	-1.613733	0.457	-2.45268	0.344	-4.032865	0.007	-4.10038	0.024
MS	-1.384699	0.561	-2.931259	0.175	-4.929471	0.0017	-5.154694	0.005

Author's calculation based on E-view software

4.3. Co-integration Test

In this regard, Johansen and Juselius (1990). Mentioned that processes use two tests to determine the number of cointegration vectors: The maximum eigenvalue test and the Trace test. The maximum eigenvalue statistic tests the null hypothesis of r cointegration relationships against the alternative of r+1 cointegration relations for r = 0, 1, 2…n-1. These test statistics computed as:

$$LR_{max}\left(\frac{r}{n}+1\right) = -T * log\,(1-\lambda) \quad \text{.....(1)}$$

According to Asteriou and Hall (2007). The concept of co-integration was first introduced by Granger (1981). Later, this was concept was further formalized and developed, by Engle and Granger (1987). Phillips (1987). Phillips and Ouliaris (1990).

and Johansen (1991). As we have analyzed in the previous section, the trended time series can possibly create problems in empirical econometrics as a result of spurious regressions. One way of resolving this problem is to take the differences from the series until stationary is achieved and then use the stationary data for running a regression (as we have done in the previous section).

However, according to Asteriou and Hall (2007). This solution is not ideal since it not only shows differences in the error process in the regression but also no longer gives a unique long-run solution. If we have two non-stationary variables, then we can represent the error as a combination of two cumulated error processes. These cumulated error processes are known as stochastic trends; typically, we could expect that they would combine to generate another non-stationary process. However, in the special case that two variables are related, then we would predict that they would move together, and so the two stochastic trends would be very similar to each other. When we combine them together, it should be possible to find a combination of them, which removes the non-stationarity. In this special case, these two variables are co-integrated, Asteriou and Hall (2007). Nowadays, a co-integration test becomes a dominant requirement for any economic model using non-stationary time series data, Gujarati (2009).

In the previous section, there is an absence of stationarity in all the variables at the level and they became a stationarity when they transfer to the first difference. This implies that a co-integration analysis must be carried out in order to analyze if the series are co-integrated in the long run or not. In this sense, the Johansen (1991). Test for co-integration should be applied. To avoid spurious regressions (non-sense regression), the possibility of co-integration and a long-run equilibrium relationship between the variables should be checked. Individual series might not be stationary, but a linear combination of these series could be stationary. Thus, we test for a co-integration test between these variables. the Johansen (1995) the procedure is applied to test for the existence of a long-run relationship between dependent variables and explanatory variables and determine the number of co-integrating equations.

On the other hand, it is established in the literature that, before running a co-integration test, determining the number of lags is essential since the co-integration test is very sensitive to the lag length. A different lag order can seriously affect the

substantive interpretation of co-integration results (see e.g. Hamilton and Herrera, 2004 and Kilian, 2005). The strategy in empirical studies is to select the lag order by some pre-specified criterion. In the econometric literature, a number of selection criteria can be used to determine the optimal lag order. The selection criteria considered in this thesis are the Schwarz Information Criterion (SIC), the Akaike Information Criterion (AIC), and the Hannan-Quinn Criterion (HQC). However, these criteria may not always draw the same conclusion on the lag order; in order words, using different criteria may draw different conclusions about the number of lags. In our analyses, we have four different equations, which are relative price, real exchange rate, the output of non-tradable goods, and output of tradable goods. Thus, co-integration tests are conducted for all these equations.

4.4. Vector Error Correction Model Results

According to Asteriou and Hall (2007) the VECM used to define the short- and long-term equilibrium relationship between economic variables. Besides, VECM can apply in the case of small samples, so unlike previous traditional methods.

The Johansen Cointegration Test results show that there is cointegration among variables in different levels. As it stated before cointegration analysis is made only with stationary variables in the same degree. Also, it is clear that it had been done by taking differences of variables. The Vector Error Correction Model corrects the "missings" caused by taking the difference. For this purpose, the Vector Error Correction Model is conducted. This method is available for correcting deviations in variables.

VECM model approaches to play when it has proven that, there exists a long-run relationship among the variables under deliberation. So, this allows the researcher to estimate the cointegrated series. However, According to Ojoko et al (2014). In a situation, there is no cointegration, VECM is no longer required, And we can proceed to Granger causality tests directly to establish a causal relationship between the variables. The VECM regression equation is given below as thus:

$$Yt = a1 + \mathrm{P1e1} + \sum_{\mathrm{i}=0}^{\mathrm{n}} \beta iYt - i + \sum_{i=0}^{n} \emptyset i\Delta Xt - i + \sum_{i=0}^{n} YiZt - i \quad \text{.....(2)}$$

$$\Delta Yt = a2 + \mathrm{P2ei} - 1 + \sum_{\mathrm{i}=0}^{\mathrm{n}} \beta iYt - i + \sum_{i=0}^{n} \emptyset i\Delta Xt - i + \sum_{i=0}^{n} YiZt - i \quad \text{.....(3)}$$

4.5. Model of the Study

Based on a research question in this dissertation, The model have been made to answer research question. The related to an investigation about Real exchange rate (RER). How it is affected by some macroeconomic variables that have been mentioned in previous chapters (Kamas, 1986). The Real exchange rate can also influence the structure of the domestic economy. In the following sections, The model will be analyzed one by one.

4.5.1. Real Exchange Rate (RER)

The Real Exchange Rate (RER) is defined as the nominal exchange rate (*E*) multiplied by the ratio of foreign price level (*P**) to the domestic price level (P).

$$RER = \frac{EP^*}{P}$$

Where *E* represents the nominal exchange rate (NER), which is defined as the number of units of local currency per unit of foreign currency.

The relative price of traded goods (international price) to non-traded goods (domestic price) as a measure to define RER can be more powerful, and it identifies more willingly the incentives that guide domestic resource allocation, Korhonen and Juurikkala (2009). Its focus on allocation of domestic resources has made this definition of RER a favorite tool for analyzing the competitiveness of a home country relative to a foreign country, particularly for developing countries.

The first research question is related to how the fluctuation Oil Revenue affects the Real exchange rate. Now, based on the Kamas's model, which, the independent variables that affect real exchange rate is via three variables namely Real government expenditure (GE), Real Oil Revenue (OR), and Real money supply (MS).

$$\mathbf{RER} = \boldsymbol{\beta_0} + \boldsymbol{\beta_1}\,\mathbf{OR} + \boldsymbol{\beta_2}\mathbf{GE} + \boldsymbol{\beta_3}\,\boldsymbol{MS} + \boldsymbol{\varepsilon_t} \qquad \mathbf{(4)}$$

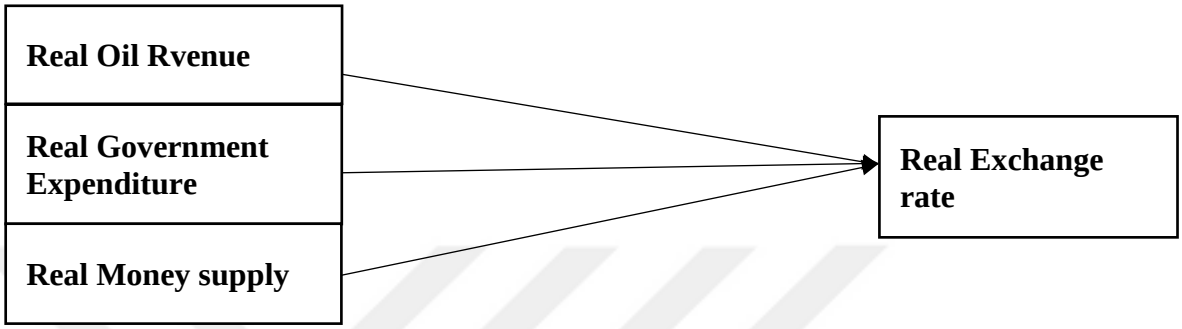
$$\frac{\delta RER}{\delta OR}, \frac{\delta RER}{\delta GE}, \frac{\delta RER}{\delta MS} > 0$$

Thus, the null and alternative hypotheses of the coefficients of the real exchange rate can be formulated as follows:

$H0$: $\beta_i 1 \ldots 3 = 0$ Null hypothesis

$H1$: $\beta_i 1 \ldots 3 \neq 0$ Alternative hypothesis

According to economic theory, the relationship between all explanatory variables (OR, GE, and MS) should positively, affect the real exchange rate. In other words, when the Oil Revenue, government expenditure, and money supply increase, the real exchange rate should increase (appreciate) and vice versa. From the outcomes of the real exchange rate (RER) regression, the coefficient of each explanatory variables will be shown.



Where

RER= Real Exchange Rate

OR = Real Oil Revenue

GE = Real Government Expenditure

MS= Real Money Supply

β_i = Slopes of the Independent Variables

β_0 = Constant

ε_t= Error Term

The study employed Vector Error Correction (VEC) method formula to investigate the relationship between Real Exchange Rate as a dependent variable, and the Government Expenditure, Oil Revenue, and Money Supply for Iraq as independent variables.

Dependent Variables

- The real exchange rate is usually defined as the ratio of the domestic price of non-tradable goods to the price of tradeable.

Independent Variables

- Oil Revenue (RO) Real Oil Revenue (RO) is total government Revenue based on 2005 constant prices.

- Government Expenditure (GE) Real Government Expenditure (GE) is total government expenditure based on 2005 constant prices, adjusted for inflation. Government expenditure can be defined as recurrent and capital (Investment) expenditure, which has been explained in Chapter Three.
- Money Supply (MS) Real money supply (MS) implies the broad money supply.

Based on Johansen's co-integration test. In the first step, the number of lag length in the VAR system is chosen. Here, the Schwarz Information Criterion (SIC) is used and the number of lag length is equal to one lag.

Table 4. 2. VAR Lag Selection Criteria

VAR Lag Order Selection Criteria
Endogenous variables: RER RO GE MS
Exogenous variables: C
Sample: 1997 2016
Included observations: 18

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-812.3509	NA	2.91e+34	90.70566	90.90352	90.73294
1	-740.1664	104.2666*	6.00e+31*	84.46293*	85.45223*	84.59934*
2	-726.5846	13.58178	1.10e+32	84.73162	86.51236	84.97716

* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion
Author'scalculationbasedonE-viewsoftware

Statistics Result

4.5.2. Co-integration tests for Real Exchange Rate

The real exchange rate is a second model in our equation system to check for the possibility of co-integration and long-run equilibrium relationship between the RER and explanatory variables, based on Johansen's co-integration test. In the first step, the number of lag length in the VAR system is chosen. Here, the Schwarz Information Criterion (SIC) is used and the number of lag length is equal to one lag.

The Trace and Max-Eigen tests for the co-integration rank are performed for model two and summarised in Tables 4.5. The results of the test (Trace test and Max-

Eigen test), Shows that the hypothesis of co-integration amongst the variables is rejected at 1 percent level of significance and the results reveal that at least four co-integrating vectors for Trace test and four co-integrating vectors exist for Max-Eigen test among the variables.

Table 4. 3. Trace and Max-Eigen for model

Sample (adjusted): 2000 2016
Included observations: 17 after adjustments
Trend assumption: Linear deterministic trend
Series: RER RO GE MS
Lags interval (in first differences): 1 to 1
Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.963476	137.5406	47.85613	0.0000
At most 1 *	0.941900	81.27419	29.79707	0.0000
At most 2 *	0.731000	32.89921	15.49471	0.0001
At most 3 *	0.463241	10.57749	3.841466	0.0011

Trace test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None *	0.963476	56.26641	27.58434	0.0000
At most 1 *	0.941900	48.37497	21.13162	0.0000
At most 2 *	0.731000	22.32173	14.26460	0.0022
At most 3 *	0.463241	10.57749	3.841466	0.0011

Max-eigenvalue test indicates 4 cointegrating eqn(s) at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values
Author's calculation based on E-view software

To conclude the co-integration results, the existence of a stable relationship between independent and dependent variables is detected from the equation. The null hypothesis of four-co-integration can be rejected in the equation (model).

Regarding the outcomes of the Real exchange rate (RER) regression**,** table 4.4. shows the result of the regression from Real exchange rate (RER) model, it shows that the outcome is consistent with the economic theory predictions in terms of coefficient sign and magnitude. A ten percent increase in the Oil Revenue causes the Real Exchange Rate to decrease by about 10.6 percent. The coefficient has the negative sign. This is an adverse long run relationship between Oil Revenue and RER, This relationship statisticaly signaficant acording to by t-test. However, A ten percent increase in the government spending brings about 0.7 percent increase in the Real Exchange Rate. The sign of the coefficient is positive to the theory and is statistically significant at a one percent level. This is an positive long run relationship between government spending and RER, This relationship statisticaly doese not signaficant acording to by t-test. The reason behind having opposite sign of government expenditure is related to subside by the Iraqi government to tradable goods particularly agriculture products (food and or basic goods). In the last two decades, the Iraqi government tried to support basic goods in order to prevent chronic poverty, therefore supporting tradable goods sector by Iraqi government during last decades led to declining the price of tradable goods against non-tradable goods via government expenditure. Regarding the third variable which is Money Supply (MS). It is found from the above test a ten percent increase in the money supply causes the Real Exchange Rate to rise by about 60.2 percent. The coefficient has the right sign and is highly statistically significant at 1 percent.

Table 4. 4.Vector Error Correction for RER

Vector Error Correction Estimates
Sample (adjusted): 1999 2016
Included observations: 18 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
RER(-1)	1.000000
RO(-1)	-0.106128 (0.03000) [-3.53738]
GE(-1)	0.078944 (0.04420) [1.78600]
MS(-1)	6.27E-05

	(3.7E-05)			
	[1.71154]			
C	184.4011			

Error Correction:	D(RER)	D(RO)	D(GE)	D(MS)
CointEq1	-0.125991	7.341619	4.691542	-4545.477
	(0.04929)	(3.62047)	(2.95482)	(1359.52)
	[-2.55617]	[2.02781]	[1.58776]	[-3.34344]
D(RER(-1))	0.042967	32.13399	-43.58607	-493.3966
	(0.30631)	(22.4993)	(18.3626)	(8448.70)
	[0.14028]	[1.42822]	[-2.37363]	[-0.05840]
D(RO(-1))	-0.013288	0.935856	0.510817	-509.7076
	(0.00510)	(0.37449)	(0.30564)	(140.624)
	[-2.60645]	[2.49903]	[1.67133]	[-3.62461]
D(GE(-1))	0.009267	-0.812523	-0.279602	407.1014
	(0.00579)	(0.42530)	(0.34710)	(159.704)
	[1.60046]	[-1.91048]	[-0.80553]	[2.54910]
D(MS(-1))	8.20E-06	0.001127	0.000706	0.191572
	(1.1E-05)	(0.00080)	(0.00065)	(0.30102)
	[0.75169]	[1.40556]	[1.07887]	[0.63641]
C	72.03517	-224.2957	564.1041	3775587.
	(41.5652)	(3053.12)	(2491.78)	(1146476)
	[1.73307]	[-0.07346]	[0.22639]	[3.29321]
R-squared	0.410174	0.652814	0.438556	0.534673
Adj. R-squared	0.164413	0.508154	0.204621	0.340787
Sum sq. resids	132930.8	7.17E+08	4.78E+08	1.01E+14
S.E. equation	105.2500	7731.006	6309.604	2903072.
F-statistic	1.668996	4.512730	1.874694	2.757667
Log likelihood	-105.7058	-183.0456	-179.3886	-289.7548
Akaike AIC	12.41176	21.00507	20.59873	32.86164
Schwarz SC	12.70855	21.30186	20.89553	33.15843
Mean dependent	38.60017	6990.092	2896.806	2278579.
S.D. dependent	115.1400	11023.55	7074.816	3575568.

Determinant resid covariance (dof adj.)	3.26E+31
Determinant resid covariance	6.44E+30
Log likelihood	-740.6214
Akaike information criterion	85.40238
Schwarz criterion	86.78740

Author'scalculationbasedonE-viewsoftware

This is an adverse long run relationship between Money Supply and RER, This relationship statisticaly does not segnaficant acording to by t-test. Therefore, these all explanatory variables (3 variables) are jointly significant and explain 41 percent of the variation in the real exchange rate. Therefore, the null hypothesis of the coefficients of the all explanatory variables can be safely rejected.

For the coefficient of RER equation, it can be said that the sign of the coefficient is negative and the T-test is larger than two which proved that the variables have a long run relationship.

Table 4. 5. Equation Test of RER

Dependent Variable: D(RER)
Method: Least Squares
Sample (adjusted): 1999 2016
Included observations: 18 after adjustments
D(RER) = C(1)*(RER(-1) - 0.10612795551*RO(-1) + 0.0789444521767 *GE(-1) + 6.26989874861E-05*MS(-1) + 184.401149157) + C(2) *D(RER(-1)) + C(3)*D(RO(-1)) + C(4)*D(GE(-1)) + C(5)*D(MS(-1)) + C(6)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.125991	0.049289	-2.556171	0.0252
C(2)	0.042967	0.306305	0.140276	0.8908
C(3)	-0.013288	0.005098	-2.606446	0.0230
C(4)	0.009267	0.005790	1.600455	0.1355
C(5)	8.20E-06	1.09E-05	0.751691	0.4667
C(6)	72.03517	41.56515	1.733066	0.1087

R-squared	0.410174	Mean dependent var	38.60017
Adjusted R-squared	0.164413	S.D. dependent var	115.1400
S.E. of regression	105.2500	Akaike info criterion	12.41176
Sum squared resid	132930.8	Schwarz criterion	12.70855
Log likelihood	-105.7058	Hannan-Quinn criteria.	12.45268
F-statistic	1.668996	Durbin-Watson stat	2.399882
Prob(F-statistic)	0.216358		

Author's calculation based on E-view software

Before conducting the Real exchange rate (RER) regression, it is important to check the serial correlation for this model. Based on serial correlation test it is found that the outcome of the serial correlation in this model demonstrates that the null hypotheses are not rejected because the probability value for these tests is 23% which are more than 5%. This means no serial correlation exists in this model.

Table 4. 6. Breusch-Godfrey Serial Correlation LM Test

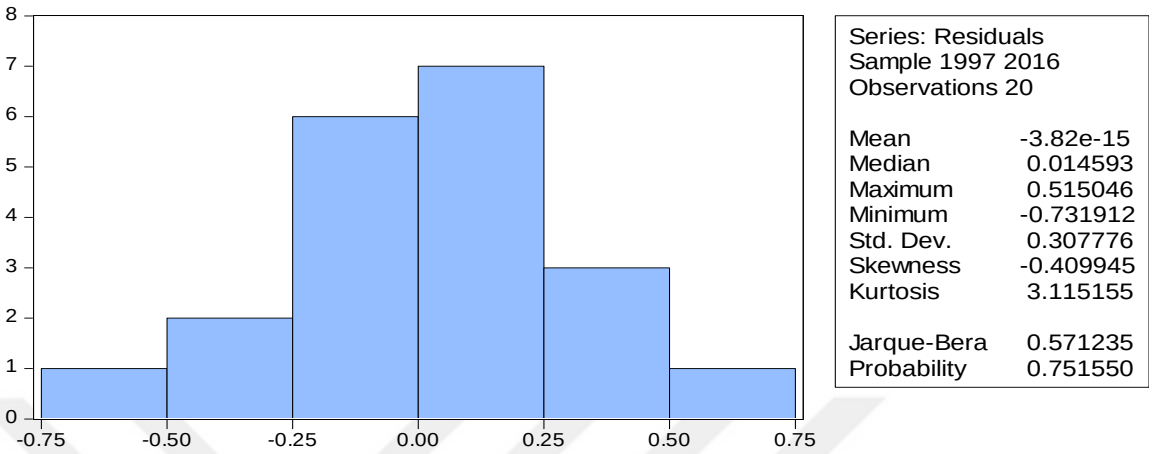
F-statistic	1.205286	Prob. F(2,14)	0.3289
Obs*R-squared	2.937828	Prob. Chi-Square(2)	0.2302

Author's calculation based on E-view software.

The outcome of normality and heteroskedasticity in this model shows that the null hypotheses are not rejected because the probability value for these tests is 75 percent %

and 9 percent respectively which are more than 5%. This means the data is normally distributed and no heteroscedasticity exists in this model.

Figure 4. 1. Normal Distribution Real Exchange Rate



Author's calculation based on E-view software.

Table 4. 7. Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	2.541291	Prob. F(3,16)	0.0929
Obs*R-squared	6.454381	Prob. Chi-Square(3)	0.0915
Scaled explained SS	4.368646	Prob. Chi-Square(3)	0.2243

Author's calculation based on E-view software.

Testing the residual for this model has also been applied. The figure, 4.7. Shows the result of the ADF test conducted on the residuals for model three which does not have unit root (stationary).

CONCLUSION AND RECOMMENDATION

Conclusion

The main objective of the research as set out in Chapter One was to analyses the consequences of the increase in the international crude oil price on the real exchange rate (RER) More importantly, it is wished to investigate the cause and consequences of the "Dutch disease", which is the squeezing of the tradable sector, enlargement of the non-tradable sector during the oil boom, resulting in the domestic appreciation of RER. This is shadowing by the highlights of the empirical analysis which forms the basis of the examination with reference to the theoretical and empirical findings. The limitations of the thesis and suggestions for future study in the last part of the conclusion are presented. Therefore, in this first step, this chapter presents a summary of the analysis presented in the prior chapters in the context of this objective.

Iraq appeared to have the right prerequisites for the Dutch disease and as the world's third largest oil exporter. It is clear that the contribution of the oil sector to the GDP is relatively large (see Chapter Three). It was also shown that Iraq is and has been mainly reliant on oil revenues, as they constitute the major part of the government revenues (see Chapter Three). The huge inflow of liquidity resulting from the increase in oil revenues caused high inflation.

On the other hand, the principal fundamental point of the entire contribution of this study is that it delivers a careful investigation with supporting empirical evidence of the issue of the macroeconomic effects of the fluctuation in oil revenue (oil price) on key variables set in a Dutch disease context for the Iraqi economy. The analysis reviewed the relationships between fluctuating oil revenue, relative price, real exchange rate and changing the structure of economics between the tradable goods and non-tradable goods sector, employing suitable current econometric methods. One of the main contributions of this study is that it delivers further empirical outcomes relating to the Dutch disease phenomena. It is very rare to find a study relating to the Dutch disease phenomenon on Iraq. The point that distinguishes this study from previous studies is that this study contained both boom and slump periods, while almost all previous studies contained only booming periods. In other words, this study delivers a

precise detailed analysis of the consequences of fluctuation in international oil prices (boom or slump) and the Dutch disease phenomenon for the Iraqi economy.

As long as the oil sector is the key driver of the Iraqi domestic economy, any fluctuation in oil revenue is transmitted directly and in a robust way to the government budget. A huge oil sector increased the public-sector involvement in the Iraqi domestic economy. This is as a result of the government's possession of the oil sector. Furthermore, the effect of the boom operated via the "spending effect" (government expenditure) instead of the "resource movement effect" as a result of the nature of the oil sector as an "enclave" sector, which infers that the oil sector has no significant linkages with the rest of the economy. By employing the modified Edwards model to analyze the effect of the oil in the Iraqi economy, the empirical findings in this study indicate some side effect:

1) It is found that the oil revenue is positively related to real government expenditure, GDP per capita and real money supply. During high oil prices, the real government expenditure, GDP per capita and money supply are enlarged, while, during low international oil prices, these macroeconomic variables drop. In the empirical chapter, however, the econometrical technique has been employed to test the relationship between some macroeconomic variables (real government expenditure, GDP per capita, money supply and price of tradable goods) and the relative price of non-tradable goods against tradable goods. The relative price equation (model one) provides supportive evidence that the government expenditure, real GDP per capita and money supply determine the RER. When the government expenditure, money supply and GDP per capita change positively, the rate of inflation increases. However, the rate of inflation among non-tradable goods is larger than the rate of inflation among tradable goods; this is because the price of the latter is determined by the international market.

2) The output of the non-traded goods sector is affected positively by RER. It is found that appreciation in the RER led to an increase in the output of the non-tradable goods sector, while depreciation (increase) of the RER led to a decrease in the output of non-tradable goods sector.

3) The result of Co-integration is good since there is at least one variable has long run relationship between dependent and independent variable. Which is considered as a good result in the view of econometrics Apart from that the result of VECM is also good since the outcome of cointegrating equation of VECM for RER is negative. Therefore, based on this result, there is a long relationship between RER and, independent variables. Regarding the detail of the test, it is found that some outcomes are not strong because of a smaller number of observations in the study.

The summary arrived at, that Iraq had experienced a Dutch disease phenomenon during the last two decades, is based on the theory that an appreciation in RER has occurred as a result of the oil boom. Moreover, the contribution of the non-tradable sector, such as that of services and construction in real GDP, has experienced an increase during high oil revenues; however, the tradable goods sector has experienced shrinking. In other words, the oil sector may have had an adverse effect on the tradable sectors, arising from the existence of the Dutch disease effect.

Finally, we explained the policy implications for Iraq. Drawing from the experiences of other oil-exporting countries, particularly developed ones, we arrived at the conclusion that the success of an economic policy is judged in terms of the economic objectives to which it is directed. We recommend that Iraq should use its revenue from the oil industry to develop productive activities in the country. However, public expenditure, particularly recurrent expenditure, must be kept within the economy's absorptive capacity. From the previous literature, some policies and strategies have been implemented to combat some macroeconomic problems that occurred due to the booming natural resource sector, in the next section these policies and strategies will be presented.

Recommendation

The economic literature on the Dutch disease phenomena of massive oil revenue inflows to oil-exporting developing economies can potentially give rise to the “spending effect” and “resource movement effect” generating economic policy challenges in terms of international competitiveness and domestic macroeconomic stability. Since the Dutch

disease phenomenon can bring about possible adverse side effects of natural resource booms, it is vital to consider policies that remedy or reduce the negative side effects of the disease. However, it is difficult to develop such policies as very little research has been undertaken in this area on the Iraqi economy. In order to be able to avoid the Dutch disease problem encountered in countries like Norway as a developed country, and Indonesia as a developing country, Iraq has had to implement a range of policies to restore the competitiveness of the non-oil sector. The issue of the real exchange rate has been put forward as being the most vital instrument because of its role in influencing the relative prices in the economy. The problem of creating an economy toward a non-tradable goods sector from a tradable goods sector was due to the appreciation of the RER of most of the oil-exporting developing countries, including Iraq. The following potential policies could be introduced to the Iraqi economy in order to at least minimize the Dutch disease phenomenon.

Stabilisation Oil Fund

The oil-exporting countries need to find a right balance between financing social, infrastructure development needs (by spending oil revenues) and maintaining macroeconomic stability (by sterilizing oil revenues). If the extra revenue from oil during times of high oil price is not well managed, this will result in more economic instability, particularly when the oil price declines. The oil-dependent countries need to pay more attention to the effects of higher government expenditure on the RER and macroeconomic stability and should apply the best policy use of windfall gains for achieving long-term development. Oil stabilization funds serve to stabilize the flow of revenue by insulating the government and the economy from revenue fluctuation that arises from the unpredictable oil extraction and sudden fluctuation oil prices. Instead, this fluctuation and uncertainty in production and price are transferred to the oil fund (oil stabilization fund), and the State uses a mechanism to limit spending (Bagattini, 2011). In this way, a government can limit the risk of Dutch disease because revenue is not spent as quickly (or slowly) during high (low) oil revenue. Such funds work in response to external factors; thus, they could quickly accumulate revenue, or revenue could rapidly be exhausted (Larsen, 2004).

To avoid, or at least reduce, the macroeconomic volatility arising from the

instability of oil revenues, it is strongly recommended that the Iraqi government creates an oil fund in order to avoid severe macroeconomic instability. There are many examples for other oil-exporting countries that have created oil funds, such as Norway, Azerbaijan, Chile (copper), the state of Alaska, Kuwait, Venezuela, and Oman. Although the benefits gained from an oil fund are different from one country to another, In general, it does work and countries with an oil fund who have a better experience with instability macroeconomic circumstances. In the Iraqi case, the oil fund has not been established although, the contribution of the oil sector to GDP is significantly high since 1970. It is argued that Establishing an oil stabilization fund abroad prevented exchange rate appreciation to large extent. Since decrease amount of saving means increase oil revenue in hand of government to spend which would trigger excess demand for non-tradable and an overall increase in prices, this is shown in our data descriptive and empirical chapter.

On the other hand, stabilization oil fund is not the only policy can Iraqi government implements. But there are some other policies besides this policy in order to avoid the Dutch Disease to a larger degree. Accordingly, the following policies should be implemented by the Iraqi government.

Fiscal Policy (Public Spending and Revenue)

A careful management of the expected oil boom is an important point in order to avoid the excessive increase of government expenditure that has characterized many oil-exporting developing countries. Otherwise, the oil revenue may adversely affect the performance of the tradable sector. From an economic point of view, the main objective of fiscal policy is the mobilization of savings, to encourage investment and development, and a reduction of income inequality, Aziz, Habibullah, Azman-Saini, and Azali (2000). However, for most oil-exporting developing countries, the case is different. Where they have plenty of capital, which is gained through exporting oil, the mobilizing savings may not be the main issue, at least not in the short term. Since oil revenues accumulate to the government directly, fiscal policy in oil-exporting countries plays the most central role in directing development because it contains both macroeconomic decisions, which are related to government expenditure, and government domestic revenue (tax), which affects the aggregate demand and

microeconomic decisions. Choosing a form of expenditure or taxation that serves such aims is planned to discourage or encourage specific types of economic activity (Morgan, 1979).

Since the government's extra revenues come from oil, representing a transfer from the foreign economy, there is no withdrawal revenue from the domestic income stream, so that the revenues have no deflationary impact on the domestic economy. Similarly, on the expenditure side, if the oil-exporting economy desires to avoid unwanted inflationary pressures, it should use the oil revenue to invest in foreign assets instead of domestic spending, since investing oil revenue into foreign assets does not cause an upsurge in domestic liquidity and incomes, and the problem of inflation does not take place, (Corden W. , 1981) described this approach as the “zero impact case”. It means that, if the whole of the oil revenues were used to accrue foreign exchange reserves or invest in foreign assets, there would be no change in the exchange rate or employment levels. The main point is that zero impact requires the government not to spend the revenue from oil, particularly when oil revenue increases suddenly. In this case, the domestic budget should depend only on non-oil revenues.

However, the zero-impact policy may not be able to apply to the Iraqi circumstance for several reasons. First, in this stage, it is impossible that the Iraqi domestic revenue can be actively employed as a tool of macroeconomic fiscal policy since the contribution of the non-oil revenue to total revenue is very small. Secondly, increasing non-oil revenues could encounter political resistance and would have an only limited influence on the demand/supply balance in the economy. Thus, it is predominantly through its domestic expenditure of the oil revenue that the government has its key impact on economic development.

Based on our empirical results, the government expenditure in Iraq has a significant effect on the real exchange rate which is appreciation real exchange rate also responsible for reallocation of resources towards the non-tradable goods sector. Therefore, it is believed that increasing government expenditure is one of the main variables which is responsible for an increase in the rate of inflation in the domestic economy; as such, the government expenditure must be kept within the economy's absorptive capacity.

Reducing Unproductive Expenditure

One of the most important problems with the Iraqi economy is its massive national income spend toward military activities and equipment during the last five decades. (Edwards, 1989) warns that the government should not spend too much money on arms and weapons that have occurred in many countries since it is considered as unproductive expenditure. This kind of expenditure must reduce to the minimal level consistent with political stability. In Iraq, high oil revenue is often related to unproductive and waste expenditures. Unnecessary spending should be eliminated completely, and rationalization of government spending should be sought by giving priority to the human resource development, which would improve productivity.

To sum up, by illustrating the policy implications for Iraq, by drawing from the experiences of other oil-exporting countries, we reached the conclusion that the success of an economic policy is exactly arbitrated in terms of the economic objectives to which it is directed. In this framework, we recommend that Iraq should use the revenue from oil to develop productive sectors in the country.

Proposals for Upcoming Studies

It is important to recognize that there are further features or policy options, such as the issue of rent-seeking, reform of financial markets and the process of privatization, that are available to the Iraqi government to consider. Incorporating the role of government institutions would represent a significant extension of the existing macroeconomic model. Including a measure of the ability and transparency of Iraq institutions and government agencies in adopting and implementing the policy options would lead to a remarkable extension to the existing model. In the case of Iraq, the absence of a strong government institution and government agencies with high efficiency might have led to mismanagement of the oil revenue, particularly during times of high oil revenue. The huge revenue made from the oil sector might have formed rent-seeking behavior by interested groups inside the Iraqi government, resulting in corruption and inefficiency. This behavior could have caused an economic failure, including higher inflation, capital flight, poor institutional quality and, henceforth, lower growth rate and failure of economic development. Consequently, the

economic indicators and lower social infrastructure might have been caused not only from the Dutch disease effects but also from rent-seeking.

In general, this thesis has recognized the prominent impact arising from oil shocks for a small oil-exporting economy like Iraq. It has also delivered some indications of the most probable economic outcomes arising from conducting alternative government policies for Iraq. The framework of the model employed in this thesis is also likely to be applicable to other oil-exporting developing economies in the Middle East, which also suffer from Dutch disease consequences.

REFERENCES

Abdul Karim, & Abdullah Mohamed. (2007). An Alternative Approach to the Study of the Phenomenon of Long-Term Growth. *Journal of Administration and Economics*, No. 65.

Alauddin, M., & Nghiemb, H. (2010). Do Instructional Attributes Pose Multicollinearity Problems? An Empirical Exploration. *Economic Analysis and Policy*, 40 (3), 351-361.

Al-Gaeed, A. (1991). *Oil Windfall, The Duch Disease and the Saudi Arabian Experience:1970-1987.* Columbia: Missouri Univ.

Alnasrawi, A. (1994). The Economy of Iraq: Oil Wars, Destruction of Development and Prospects, 1950-2010. *Digest of Middle East Studies*, 4, no. 2, 77–90.

Anderson, L., & Stansfield, G. (2004). *He Future of Iraq Dictatorship, Democracy, Or Division.* New York: Palgrave Macmillan.

Aronson, J. (1985). *Public Finance.* Lehigh: Mc Grow Hill Lehigh University.

Asteriou, D., & Hall, S. (2007). *Applied Econometrics: A Modern Approach, Revised edition.* Palgrave Macmillan: Hampshire.

Asteriou, D., & Hall, S. (2007). *Applied Econometrics: A Modern Approach, Revised Edition.* Hampshire: Palgrave Macmillan.

Aziz, M., Habibullah, M., Azman-Saini, W., & Azali, M. (2000). Testing for Causality between Taxation and Government Spending: An Application of Toda-Yamamoto Approach. *Pertanika Journal of Social Science and Humanities*, 8 (1), 45-50.

Bagattini, G. (2011). The Political Economy of Stabilisation Funds: Measuring their Success in Resource-Dependent Countries. *IDS Working Papers*, (356), 01-60.

Belsley, D. A. (1991). A Guide to Using the Collinearity Diagnostics. *Computational Economics*, 4 (1), 33-50.

Benjamin, N., Devarajan, S., & Weiner, R. (1989). The 'Dutch'Disease in a Developing Country: Oil Reserves in Cameroon. *Journal of Development Economics*, 30 (1), 71-99.

Brown, M. (1979). The Nationalization of the Iraqi Petroleum Company. *International Journal of Middle East Studies*, Vol. 10, no (1), 107-124.

Central Bank of Iraq, R. (2017). *Central Bank of Iraq Statistical and Research Department / Annual Statistical Bulletin, Various Issues.* Baghdad: Annual Statistical Bulletin, Various Issues.

Clarke, J., & Mirza, S. (2006). A Comparison of Some Common Methods for Detecting Granger Noncausality. *Journal of Statistical Computation and Simulation*, Vol. 76, No. 3, March 2006, 207–231.

Corden, M. N. (1982). Booming Sector and De-industrialisation in a Small Open Economy. *The Economic Journal*, Vol, 92, (368), 825-848.

Corden, W. (1981). The Exchange Rate, Monetary Policy and North Sea Oil: The Economic Theory of the Squeeze on Tradeable. *Oxford Economic*, 33, 23-46.

Corden, W. (1984). Booming Sector and Dutch Disease Economics: Survey and Consolidation. *Oxford Economic Paper*, 36 (3), 359-380.

Edwards, S. (1983). Floating Exchange Rates, Expectations and New Information. *Journal of Monetary Economics*, 321-336.

Edwards, S. (1986). Are Devaluations Contractionary. *The Review of Economics and Statistic*, Vol. 68, No. 3, 501-508.

Edwards, S. (1989). Implications of Alternative International Exchange Rate Arrangements for The Developing Countries. *New Institutional Arrangements for The World Economy*, 34-84.

Edwards, S., & Aoki, M. (1983). Oil Export Boom and Dutch Disease: A Dynamic Analysis. Resource and Energy. *A Dynamic Analysis. Resource and Energy*, 5, (3) 219-242.

EIA. (2015). *Energy Information Administration (2015) Independent Statistics and Analysis Report 2015.* Washington: Country Analysis Brief: Iraq, Washington. EIA.

Ellman, M. (1981). *Natural Gas, Restructuring and Re-industrialisation: The Dutch Experience of Industrial Policy.* London: Oil or Industry.

Engle, R., & Granger, C. (1987). Co-integration and Error Correction: Representation, Estimation, and Testing. *Econometrica: Journal of the Econometric Society*, 251-276.

Fardmanesh, M. (1991). Dutch Disease Economics and Oil Syndrome: An Empirical Study. *World Development*, 19 (6), 711-717.

Foote, C., Block, W., Crane, K., & Gray, S. (2004). Economic Policy and Prospects in Iraq. *Economic Perspectives*, Vol. 18, no. (3), 47-70.

Granger, C. (1981). Some Properties of Time Series Data and Their use in Econometric Model Specification. *Journal of Econometrics*, 16 (1), 121-130.

Gujarati, D. (2009). *Basic Econometrics.* New York: Tata McGraw-Hill Education.

Gylfason, T. (2001). Natural Resources, Education and Eeconomic Development. *European Economic Review*, 45 (4), 847-859.

IMF. (2016, June 11). *International Monetary Fund*. Retrieved from file:///F:/PH.D/PH.D%20first%20year/reference%20%20new/IMD%202016%20-%20Copy.pdf: Economic Diversification in Oil-Exporting Arab Countries. Annual Meeting of Arab Ministers of Finance.

Ismail, K. (2010). The Structural Manifestation of the 'Dutch Disease': The Case of Oil Exporting Countries. *IMF Working Papers*, 1-36.

Jaffe, A. (2007). *Iraq's Oil Sector: Past, Present and Future. James A. Baker III Institute for Public Policy and the Japan Petroleum Energy Center.* Rice University: James A. Baker III Institute for Public Policy and the Japan Petroleum Energy Center.

Johansen, S. (1991). Estimation and Hypothesis Testing of Cointegration Vectors in Gaussian Vector Autoregressive Models. *Econometrica: Journal of the Econometric Society*, 1551-158.

Johansen, S. (1995). *Likelihood-Based Inference in Cointegrated Vector Autoregressive Models.* Oxford: Oxford University Press on Demand.

Johansen, S., & Juselius, K. (1990). Maximum Likelihood Estimation and Inference on Cointegration with Application to the Demand for Money. *Oxford Bulletin of Economics and Statistics, 52*(2), 169-210.

Kamas, L. (1986). Dutch Disease Economics and the Colombian Export Boom. *World Development*, 14 (9), 1177-1198.

Karkhi, & Majid Abdel Jafar. (1999). *The State Budget, Its Concept, Methods of Preparation and Trends Modern.* Baghdad: Directorate of Dar al-Kitb for Printing and Publishing, Mustansiriya University, .Baghdad.

Katzman, K. (2003). *Iraq Weapons Threat, Compliance, Sanctions, and The U.S Policy.* Washington D.C. Library of Congress: Congressional Research Services Report.

Kaufmann, R. (1995). The Economic Multiplier of Environmental Life Support: Can Capital Substitute for a Degraded Environment? *Ecological Economics*, 12 (1), 67-79.

Kazar, & Fadil Karya. (1990). *Iraq's Non-Oil Exports, Unpublished Master Thesis.* Baghdad: Faculty of Management and Economics, University of Baghdad.

Korhonen, I., & Juurikkala, T. (2009). Equilibrium Exchange Rates in Oil-Exporting Countries. *Journal of Economics and Finance*, 33 (1), 71-79.

Larsen, E. (2004). Escaping the Resource Curse and the Dutch Disease?: When and Why Norway Caught up with and Forged Ahead of its Neighbors. *Accessed 25 September 2015* (pp. Discussion Papers No. 377, May 2004 Statistics). Norway: Research Department.

Looney, R. (1990). Oil Revenues and Dutch Disease in Saudi Arabia: Differential Impacts on Sectoral Growth. *Canadian Journal of Development Studies*, Vol. 11, (1) 119-133.

Ministry & of Finance. (2016). *Ministry of Finance, Budget Department, Various Issues.* Baghdad: Budget Department.

Ministry & of Planing of Iraq. (2010). *National Development Plan, 2010-2014.* Baghdad: Ministry of Planning of Iraq.

Ministry & Resources, O. N. (2017). *Iraq Retains Major, Gas Potential amid Challenges.* Erbil: Ministry of Natural Resources.

Morgan, D. (1979). Fiscal Policy in Oil Exporting Countries, 1972-78. *Staff Papers*, 26 (1), 55-86.

Musonda, F. M., & Luvanda, E. (1991). The Consequences of the 1976-77 Coffee Boom on the Tanzanian Economy: A Test of the Dutch Disease Model. *East Africa Economic Review*, 1-17.

Neary, P., & Wijnbergen, V. (1986). *Natural Resources and Macroeconomy.* Oxford: Oxford. Basil Blackwell.

Nidal , S. J. (1991). *Factors Affecting Iraq's Foreign Trade for the Period (1970-1988).* University of ,Baghdad: Unpublished Master Thesis, Faculty of Management and Economics.

Nyatepe, C. A. (1994). Dutch Disease, Government Policy and Import Demand in Nigeria. *Applied Economics*, 327-336.

OPEC. (2016, July 2). *Organisation of the Petroleum Exporting Countries*. http://www.opec.org/opec_web/static_files_project/media/downloads/publications/ASB 2016.pdf: Annual Statistical Bulletin. Vienna

Phillips, P. C. (1987). Towards a Unified Asymptotic Theory for Autoregression. *Biometrika*, 74 (3), 535-547.

Phillips, P., & Ouliaris, S. (1990). Asymptotic Properties of Residual Based Tests for Cointegration. *Econometrica: Journal of the Econometric SocietY*, 165-193.

Roemer, M. (1994). Dutch Disease and Economic Growth: The Legacy of Indonesia. Development Discussion. *Harvard University*, 489.

Sachs, J., & Warner, A. (2001). The Curse of Natural Resources. *European Economic Review*, 45 (4), 827-838.

Salter, W. E. (1959). Internal and External Balance: The Role of Price and Expenditure Effects. *Economic Record*, 35 (71), 226-238.

Schnepf, R. (2003, February 11). *Iraq's Agriculture: Background and status. Congressional Research Service, Library of Congress*. Retrieved from http://nationalaglawcenter.org/wp-content/uploads/assets/crs/RS21516.pdf: Accessed 11 February 2016

Shwadran, B. (1977). *Middle East Oil: Issues and Problems 3rd Edition.* New York: Transaction Publishers.

Styan, D. (2006). *France and Iraqi, Oil Arms and France Policy Making in the Middles East.* London: Tauris Nad Co Ltd.

Tarnoff, C. (2011, February 15). *Iraq: Reconstruction Assistance. New York: Congressional Research Service. Available at*. Retrieved from https://www.fas.org/sgp/crs/mideast/RL31833.pdf: Congressional Research Service. Available at

Usui, N. (1997). Policy Adjustment to the Oil Boom and their Evaluations: The Dutch Disease in Indonesia. *World Development*, Vol. 24, (5) 887-900.

Wallensteen, P., Staibano, C., & Eriksson, M. (2005). *The 2004 Roundtable on UN Sanctions Against Iraq: Lessons Learned, Uppsala, Uppsala University Department of Peace and Conflict Research.* Uppsala: Uppsala University Department of Peace and Conflict Research.

Warr, G. (1986). lndonesia's Other Dutch Disease: Economic Effects of the Petroleum Boom. In Neary, P., and Van Wijnbergen, S., (eds.) Natural Resources and The Macroeeonomy. *Basil Blackwell, Oxford*, 53-89.

World Bank. (2008). *Mineral-Rich Countries and Dutch Disease.* Jurdan: World Bank.

APPENDIXES

Year	Real Government Expenditure	Real GDP per capita (Constant 2005 $)	Real Oil Revenue	Real Money Supply
1997	8389.978195	63182979850	5207.237047	3067089.908
1998	8400.706508	85206731245	6123.218905	4747083.52
1999	17216.61789	1.00188E+11	14190.66687	3044415.861
2000	25672.57525	1.01597E+11	22422.25053	2467587.843
2001	21339.43806	1.03939E+11	17299.41524	3833673.539
2002	16872.98286	96767263938	13672.31665	5017134.536
2003	9520.501925	64736488642	7982.23171	8916839.535
2004	19822.45742	99796330255	18353.24649	13428657.85
2005	23928	1.04188E+11	23648	11399125
2006	28169.27494	1.14772E+11	29512.9294	13101187.27
2007	30871.0575	1.16353E+11	37141.15238	16003872.24
2008	45377.34679	1.25926E+11	51559.84816	15716661.04
2009	43786.03438	1.30182E+11	38097.60943	26731202.65
2010	46506.09764	1.38517E+11	47444.69202	31213298.21
2011	61629.88176	1.4897E+11	70007.12135	30835975.58
2012	66975.9289	1.69731E+11	80349.84978	29850444.05
2013	64985.42344	1.80886E+11	75052.76113	33062422.91
2014	71743.55	1.82152E+11	83888.91	42692448
2015	62854.32	1.90895E+11	116837.77	45435425
2016	60543.21	2.11894E+11	131944.87	45761498

Year	Pn/Pt	Real Oil Price	Nontradable Goods	Real Exchange Rate
1997	9621591449	27.03	22804481729	41.87582258
1998	10203066913	31.59	25106239540	50.36077185
1999	11505233939	27.68	30463535681	55.06902807
2000	10411384295	17.79	33199801312	56.34632778
2001	10790602481	24.91	33935950401	68.40219012
2002	11727489063	38.69	33279058055	68.37344608
2003	8330636524	29.85	22264742589	55.86209274
2004	8886225079	31.68	41204331318	95.91981868
2005	11103002673	36.21	43123446450	100
2006	11689491493	45.66	46073204405	100.3353265
2007	9102684044	60.17	46022381457	101.8950324
2008	8257016496	94.1	47995607939	118.2381846
2009	9256024677	60.86	50066238541	149.9423625
2010	10294826496	77.38	54082775726	169.9360217
2011	11531695543	107.46	57885311311	144.0896859
2012	11025634304	109.45	65780382183	142.9785455
2013	11597341477	105.87	71828764177	129.3956805
2014	10776897150	96.29	68253231070	124.5437
2015	5998802022	64.49	69921915377	123.5438
2016	8669739152	58.3	64867328811	120.163

Sources: (Central Bank of Iraq, 2017)and (World Bank, 2008)

CURRİCULUM VİTAE

PERSONAL INFORMATION		
Name and Surname	Soran Zaher Abdullah ABDULLAH	
Date of birth	1 January 1983	
Adress	Chamchamal - Sulaymaniyah - Iraq	
Phone (Iraq) **Phone (Turkey)**	+9647501281960, +9647701282456 +905373025708	
E-mail	soranzaherabdullah@gmail.com	

EDUCATION AND TRAINING		
Degree	**Institution**	**Time Interval**
Bachelor of Science	Sulaymaniyah University, College of Economic and Administration, Department of Economic	2009 - 2013
Master of Science	Siirt University, Faculty of Economic and Administration, Siirt (TURKEY)	2016 - 2018

WORK EXPERIENCE		
Ministry	**Position and Responsibilities**	**Time Interval**
Ministry of education	Teacher	2013 - 2015
Ministry of Higher Education	Research Assistant in the College of Economic and Administration	2015 - 2016

PERSONEL SKILS	
Languages	Kurdish mother language
	Arabic
	English
Computer skills	MS Word, MS Excel, MS PowerPoint, SPSS, and EViews.