https://gospodarkainnowacje.pl

GOSPODARKA I INNOWACJE

LABORATORIUM WIEDZY Artur Borcuch

Volume: 43 | 2024

Economy and Innovation
ISSN: 2545-0573

For more information contact: editor@gospodarkainnowacje.pl

MEASURING THE IMPACT OF OIL PRICE FLUCTUATIONS IN GLOBAL MARKETS ON INVESTMENT BUDGETS IN IRAQ USING ARDL METHODOLOGY FOR THE PERIOD (2004-2021)

Chasib Abd al Sadha Khanjar
University of Basra/College of Administration and Economics/Department of Economics

Prf. Dr. Sami Obiad Muhammed al Tamimi
University of Basra/College of Administration and Economics/Department of Economics

A R T I C L E I N F O.

Keywords: oil prices, investment spending, ARDL model.

Abstract

The study intends to examine oil prices in international markets and elucidate their influence on Iraqi government investment expenditures from 2004 to 2021. Three sections of the research were created in order to accomplish this. The first section was devoted to the concept of the oil price and its types an explanation of the most important factors that lead to its fluctuations and instability in Oil markets, and then a review of the changes that occurred during the period from 2004-2021. The idea of investment budgets and how to finance them was covered in the second section. The structure of public expenditures in Iraqi budgets was analyzed and the focus of our research was specifically the analysis of the structure of investment expenditures, while the third section was devoted to the topic of measuring The impact of oil price fluctuations on investment budgets in Iraq, using the Autoregressive Distributed Slow Regression (ARDL) methodology and using a package of statistical programs Eviews12 to analyze and demonstrate the impact.

An introduction:

One of the most crucial tools for directing state operations, advancing social and economic development, and achieving the best possible use of human and material resources is the investment budget, which allocates funds to ministries, governorates, and organizations outside of ministries so they can construct new projects. complete other projects, or expand existing projects, usually, These budgets are affected by the fluctuations that occur in global oil prices, and thus this may reflect negatively on the investment allocations to the administrative units in the country, assuming that there is a direct relationship between oil prices and investment spending allocations. The higher the oil prices, the greater the investment allocations and vice versa, and then these allocations take on the character of instability accordingly. For changes that occur in prices as a result of several external factors that may be economic, political, climatic, etc.

Significance of the Study

The research is significant because it deals with the stability of investment spending and how it affects Iraq's economy, which is largely dependent on oil revenues that fluctuate periodically based on changes in the price of oil in international markets.

Problem Statement:

The Iraqi economy is classified as a rentier economy since it depends heavily on the oil industry to drive the country's economy, making it susceptible to changes in the price of crude oil globally. The following query can be used to formulate the issue: How much do changes in the price of oil globally impact Iraq's investment budgets during the study period?

Research hypothesis:

Do fluctuations in global oil prices lead to the instability of investment spending in Iraq to a large extent?

Aims of the Study:

- Examining how the price of oil changed globally over the study period.
- Examining Iraq's investment budgets throughout the study period.
- Explaining the extent to which investment budgets in Iraq are affected by fluctuations in international oil prices.
- Trying to present some proposals that would stabilize investment budgets in Iraq.

Limitations:

The temporal boundaries are represented by the period from 2004 to 2021, while the spatial boundaries are represented by using Iraq as a case study.

Methodology:

The standard method is used to quantify the effect of changes in international oil prices on investment budgets in Iraq, while the inductive approach is used to analyze changes in international oil prices and investment budgets.

The first part

Analysis of oil price fluctuations in global markets

The issue of oil pricing is one of the most controversial issues, as the price of oil was and still is one of the most important axes of conflict between oil-exporting and oil-importing countries, as international oil companies had a major role in the oil industry and they ruled for a long period and had almost complete control over Prices and other affairs of oil operations, but this power receded and disappeared after nearly half a century of exploitation for the interests of exporting countries, after the establishment of OPEC, specifically since 1973, through which it was able to regain its full authority to determine oil prices and production quantities, and since then it has raged. Conflict over oil prices and other related aspects.

There are many facets and joints to the topic of oil pricing, but in this study, we will focus on the relevant ones. The study is therefore split into two main areas of focus: the first addresses the idea of oil price, its various forms, and the factors that influence it; the second focuses on the fluctuations in crude oil prices that took place in international markets between 2004 and 2021.

The First Requirement

Oil prices: their concept, types, and factors affecting them

First: The concept of oil price

The value of an oil commodity, expressed in monetary terms for a given period and influenced by a variety of political, economic, and climatic factors, is known as the price of oil. For rentier states, oil revenue is a significant source of income. As a result, oil revenue is recycled within the local economy through the general budget, resulting in the emergence of other revenue streams. For instance, money allocated to initiatives, social services, transfer payments, etc. The government may invest part of oil revenues abroad by creating investment portfolios abroad (such as investing in stocks and bonds), which adds new types of income (interests and profits) for the state to use again. (Al-Janani, Al Jabri, 2020, 4-5)

Second: Types of oil prices

There are several types of oil prices, the most important of which are:

- **The announced price**: is the price that the commodity's supplier formally announces; earlier, monopolistic oil companies set the price. The Standard Oil Company of New Jersey in the United States of America, which was in charge of refining and transporting crude oil, first announced it in 1880 (Al-Marsoumi, 2011: 103). This kind of pricing was in place until the early 1970s of the 20th century when OPEC approved its oil prices alongside the monopolistic oil companies.

The declared price is the price of a barrel of oil announced by companies at the mouth of the well without involving its users in the pricing process. With the increasing activity of companies outside the United States of America and under the concession system, the declared price became a reference for the price of a barrel of oil on export platforms, and the declared price was used to impose taxes on Oil companies, which led to oil companies concluding secret contracts with countries at prices lower than the announced price to avoid competitors using the information to develop discount pricing strategies. (Al-Kinani, Al-Jabri 2021: 38)

- **The achieved price:** It's the price that's been advertised after rebates and discounts are deducted to entice the buyer in light of the oil's poor quality and problematic location. The percentage that has been subtracted from the listed price and the discounts is as follows (Hamza, Muhammad, 2022: 490).
- **Geographic location discounts:** These discounts are deducted from countries that do not have a geographical location overlooking the sea that allows them to export directly to global markets.

Sulfur content discounts: These discounts are for the benefit of buyers of oil with a high content of sulfur and impurities.

- **Density grade discounts:** These discounts are of a large percentage for buyers of heavy oils and a smaller percentage for buyers of light oils.
- **Suez Canal discounts**: These discounts are for countries that export their oil directly to global markets without going through the Suez Canal.
- **The tax cost price:** It shows the actual price that the big oil companies pay to the governments that produce oil to obtain crude oil by the agreements they made. The procedures used to determine these prices between the two parties are as follows: (Amal, 2021: 253).

Tax cost price = production cost + government revenue

Government revenue = rent + tax.

- **Signal price:** This type of price appeared in the sixties after the appearance of realized prices and

announced prices, and it was used to calculate the value of oil between some oil-producing countries and foreign oil companies to distribute or divide oil financial revenues between the two parties. The signal price has two concepts:

- ✓ It is the price that is higher than the achieved price but lower than the price that was announced. An agreement between the producing company and the importing country represents the midpoint between the two prices and reaches the signal price.
- ✓ It is the average of a basket of oils that are close in density or dissimilar in geographical location to form an indicator or signal for pricing a group of oils according to the closeness or distance of the density of the oils to the signal price of oil. There are many signal oils, including Arab Light Oil (Ras Tanura, OPEC), West Texas Oil (Oil Brent), and North Sea oil.

- ➢ **Nominal price:** It is essentially the price at which a barrel of crude oil is traded on the market on a given day. Nominal prices can include specific types of oils, such as light or heavy oil, depending on the percentage of their sulfur content. They are associated with various markets, such as the price of Brent or Arab oil. and additional automobiles. (Al-Maksousi, Al-Taie, 2018: 725).

Third: Factors affecting oil prices

The economic forces of supply and demand interact to determine the price of any commodity, including oil. When supply and demand for a commodity are balanced, the price remains constant; however, any imbalance in the market, whether it be on the supply or demand side, results in an increase or decrease in price.

Previously, prices were under the control of monopoly oil companies, so they were stable and fixed because they maintained constant supplies equal to global demand on an ongoing basis, and indeed those companies succeeded in their production methodology. (Abadi, Al-Tamimi, 2019: 6) Nowadays, the importance of oil has increased as a strategic commodity governed by many factors that affect its prices on the international market and make it unstable. We mention the most important of them:

1. Economic factors

A - Global oil demand: Oil demand is divided into two types: demand for consumption and demand for speculation. Oil demand has been affected by several changes since the oil industry, and global oil demand is constantly increasing, as demand for consumption is affected by the increase in global economic growth, which has contributed to the increase.

The demand for petroleum products, the entry of China and India and the increase in their consumption of oil led to an impact on the global oil demand. Changes in national products are among the most important factors influencing changes in the demand for crude oil, but this impact varies from one country to another according to the degree of economic progress associated with oil consumption. Crude oil demand is derived from the demand for petroleum products and the rate of change in energy consumption resulting from the change in the economic growth rate, which is called the energy coefficient or energy consumption coefficient, and this coefficient increases in the first periods of economic growth affected by increased income. (Abadi, Al-Tamimi, 2019: 6)

Regarding the need for oil for speculative purposes, these markets have emerged since the middle of the 20th century as a result of the entry of brokers and speculators into international markets and their transactions involving the sale of paper barrels to make money. Numerous variables, each with a unique impact, have primarily influenced demand, including rates of economic growth that stimulate demand. additionally, the national product. Al-Muzaini (2013), p. 334

B - Global oil supply: The size of oil reserves is one of the main factors affecting oil prices, as the discovery of new and proven oil reserves that can be extracted at economic costs commensurate with the level of crude oil prices prevailing in oil markets affects the price level. (Al-Nasrawi, 2019: 326)

The strategic or commercial reserve is another factor that affects the world's oil supply, particularly during periods of seasonal fluctuations.

Therefore, any imbalance between supply and demand will affect prices, which may go up or down depending on the presence of these factors or some of them.

C - The exchange rate of the US dollar: The price of a barrel of crude oil is linked to the dollar because of its stability or strength. Due to this link, all oil exchange operations are carried out in the dollar currency, and therefore any increase or decrease in the price of the dollar will negatively or positively affect the economies of oil-producing countries (Al-Nasrawi). (2015: 327) In the international market, crude oil is priced in dollars, and therefore when the value of the dollar decreases in the markets, oil prices rise in dollars. Therefore, any decrease or increase in exchange rates will affect the price of crude oil in the oil market through direct or indirect means (Khaleel, 2021: 3).

T- Speculation in oil futures markets: Speculation in oil markets is one of the phenomena that affects prices, and the basis of speculation is to rely on future expectations that are based on economic, political and climatic indicators. If there is an expectation that prices will rise in the future, speculators will buy and store oil and this purchase will contribute to an increase in prices, but if there is an expectation that prices will decrease in the future, they will sell their oil stocks, causing an increase in the volume of supply and then a decrease in the price level. (Alawi, 2019, 172).

2. **Political factors:** Political considerations also have a significant and significant part in the volatility of oil prices because of the tensions, disruptions, and conflicts that arise in the regions that produce and refine oil. These events jeopardize the security of the supply of oil to consumers and drive up the price of oil.
3. **Environmental and climatic factors:** The climatic factor has an important and influential role in oil prices, especially in the event of hurricanes and earthquakes, which are factors related to fluctuations in the seasons of the year, such as Hurricane Katrina, which struck the United States of America, and its direct repercussions were on a huge rise in crude oil prices and other environmental fluctuations. The weather can affect prices if they rise or fall, especially in the winter and snowfall, which increases energy demand. (Khalidiya, 2016: 55)
4. **Global crises:** These crises, which included the 2008 financial crisis, presented significant difficulties for the oil markets. During a period when the US mortgage crisis extended to the credit markets, many bank failures and subsequent collapses in the financial markets resulted in a general slowdown in growth rates. The economies of the world caused significant declines in oil prices, as well as what happened after the financial crisis of 1999 and the accompanying decline in global demand for oil and thus a decline in its prices. (Faraj, 2015: 50)

Similar to the Corona (COVID-19) pandemic, which caused severe disruptions in all spheres of the global economy—economic, political, and social—oil prices plummeted to previously unheard-of levels as a result of a third-party decline in global demand and contract prices. Due to the surplus in oil production brought about by the decline in consumption volume, US oil deliveries anticipated for May 2020 have hit an all-time low. Transport movement has stopped internally and externally in most countries of the world, the level of movement has declined, air traffic has stopped, and curfew and social distancing measures have all contributed to the decline in demand for Petroleum products. (Mustafa, 2021: 25)

5. **Industrial crude oil:** It refers to shale oil, which is the oil that is produced from rocks and oil sands by way of a chemical process called thermal analysis. Because of its significance in supplying substitute energy sources, this kind of oil may have a considerable effect on crude oil prices. This is particularly true given that Oil plays a significant influence in affecting prices through its impact on the oil supply because it is present in many parts of the world and huge quantities in the United States and other countries (Ziyarah, Naji, 2020: 120).

The second requirement

Changes in crude oil prices in global markets for the period 2004-2021

In the year 2004, oil prices increased compared to the year 2003 when they were approximately $28.2 per barrel, and the price of a barrel of oil in 2004 reached $36.50/barrel on average during the year, see Table (1). Among the reasons for this were several factors of a geopolitical and climatic nature, the most important of which are The security unrest witnessed by some oil-producing countries, including Iraq, the ethnic and tribal problems in Nigeria, the political crisis and the comprehensive strike in Venezuela, which led to the cessation of oil exports (Secretary-General's Annual, 2004: 36), and prices continued to trend upward during the years 2005, 2006, 2007 until they reached.

The price of a barrel of oil rose to $69.80 due to traditional market factors of supply and demand, as global oil demand increased as a result of the high growth rates in China and India, compared to the continuous decline in supply from some other regions, the most important of which is the North Sea due to the phenomenon of natural depletion of its fields and natural disasters caused by hurricanes such as hurricanes. Katrina, which was the worst natural disaster in America and the resulting lack of production, as well as the security tensions experienced by some major producing countries, especially in the Middle East, most notably the Iranian nuclear crisis (Secretary-General's Annual, 2007: 40), and the increase continued. in prices, until the price of a barrel of oil reached $94.45/barrel in the year 2008, but then prices decreased in 2009 until the price of a barrel of oil reached $61.60/barrel, i.e. a decrease of $32.85/barrel due to the financial crisis and its negative repercussions on the global economy and the beginning of Successive collapses in financial markets, and about the relationship between economic growth and global demand for oil, economic growth rates declined in most industrialized countries, declining from (5.2%) in 2007 to (3.0%) in 2008 and then to (1.1%) in 2009.

The industrialized nations, which consume roughly 54% of the world's oil, saw a decrease in their economic growth rate at the international group level from 2.6% in 2007 to 0.6% in 2008 and finally 3.4% in 2009. As a result, the drop in rates had an effect. The growth rates of the oil demand, which was (1.2) in 2007, (-0.3) in 2008, and (-1.6) per cent in 2009, are what determine the growth rates of the economy (Secretary-General's Annual, 2007: 41,34).

The year 2010 witnessed a rise in prices, as they rose to 77.45 compared to $61.60/barrel in 2009, i.e. an increase of $15.85/barrel, equivalent to about 26%, due to the state of global economic recovery after the financial crisis. The oil market went through a state of balance and stability due to the role it played. OPEC during the major reduction it made in its production, which helped reduce the size of the surplus oil supply in the market, and also due to the weather conditions and extreme cold, especially in Europe and the United States, in addition to speculation (Secretary-General Annual, 2010: 55-54) and in the year 2011 Prices exceeded the $100 barrier to reach $107.46/barrel, an increase of $30/barrel, equivalent to 39%. This is due to the political tensions in the Arab region that began in Tunisia at the end of 2010, then Libya in 2011, and the accompanying global concern about its extension.

To include oil-producing countries, in addition to the tension over Iran's nuclear program and the fears it raised about the possibility of disruption of supplies due to the closure of maritime transport routes in the Arabian Gulf, and also due to the natural disasters that occurred during that period, most notably the Japanese Fukushima accident, and the weather conditions that the hemisphere witnessed. The northern part experienced a bitterly cold winter at the beginning of 2011 (Secretary-General's Annual, 2011: 57-58). Prices continued to rise until they reached their highest level during the study period in 2012, at around $109.45/barrel, compared to 2011, which was around $107.46, i.e. a 2% increase. Almost the most important factors that affected the price movement this year are the efforts of OPEC and its decisions to maintain its production without making any change, in addition to the tension over Iran's nuclear program and the oil embargo imposed on it by the European Union and the American economic sanctions and the effects.

The prospect of cutting maritime transit channels in the Arabian Gulf raised worries about the

likelihood of halting supplies (Secretary-General Annual, 2012: 57). But after this year, prices started to progressively drop, going from $105.87 per barrel in 2013 to $96.29 per barrel in 2013, then $49.49 per barrel in 2015, and finally $43.70 per barrel in 2016. This is due to several factors, the most significant of which are geopolitical developments, particularly in Syria, Libya, and other oil-producing nations like Nigeria, Angola, and South Sudan, as well as the slowdown in the rates of economic growth of countries that consume oil, particularly China, which has an impact on demand.

Globally, in addition to the increase in oil production from countries that are not members of OPEC, especially after the increased exploitation of non-conventional sources of oil (shale oil) in the United States of America. Consequently, the produced quantities of shale oil increased by about (2.6) million barrels/day in 2014 and 2015 to The aspect of speculation on oil prices through future expectations, as speculators expected the continued decline in oil prices, so they proceeded to sell their reserves at sea, as well as an increase in the levels of global oil reserves (Secretary-General for the years 2013 to 2016: 45-47).

After this period, prices rose in the years 2017-2018, reaching $52.43/barrel and $69.78 per barrel, respectively. This is after the OPEC and non-OPEC oil producers agreed to raise prices in addition to the decline that occurred in global oil stocks by about 1.7% compared to the levels of 2017. 2016 as well as due to the high rates of growth in global demand for oil. Then, prices fell to $64/barrel in 2019 and then to their lowest level in 2020, where they reached $41.80/barrel, as a result of the decline in global demand for oil, which caused a sharp decline. Oil consumption due to the Corona epidemic (COVID-19) and the accompanying health measures and suspension of flights, led to a negative impact on economic growth in all economic and industrial fields around the world, especially China (Secretary-General for the years 2017 to 2020: 45 -48). In addition to the Corona pandemic, the failure of negotiations between OPEC and its allies led to the collapse of oil prices. In March, OPEC proposed reducing production by 1.5 million barrels per day in the second quarter of 2020, including one million barrels produced by OPEC members and half a million by non-members, most notably Russia, but The next day, Russia rejected the proposal, which prompted the Kingdom of Saudi Arabia to increase production to 12.3 million b/d, which represents its maximum production capacity.

Prices immediately dropped by more than 30% as a result (Amal, 2021: 258). Regarding 2021, oil prices for the OPEC basket saw their best performance in 2020, closing at $69.89 per barrel as a result of bettering conditions in the global oil market and rising demand for the commodity amid a robust rebound in global GDP growth of 5.6% and a substantial economic stimulus package (OPEC, Annual Report 2021: p. 13).

Table (1) Spot price of OPEC crude basket for the period (2004-2021) (dollar/barrel)

YEAR	OPEC basket prices
2004	36.50
2005	50.64
2006	61.80
2007	69.80
2008	94.45
2009	61.60
2010	77.45
2011	107.46
2012	109.45
2013	105.87
2014	96.29
2015	49.49
2016	43.70
2017	52.43

2018	69.78
2019	64.00
2020	41.80
2021	69.89

Source:

1. International Energy Agency/available on the U.S. website. Energy Information Administration (EIA)

   www.eia.gov

2. OAPEC, Annual Report of the Secretary-General, for the period 2004-2021, available on the website:

   http://oapecorg.org

The second part

Investment budget: its concept, financing, and analysis

The first requirement

The theoretical framework of the investment budget

First: The concept of the investment budget:

Depending on the perspective from which it was regarded, as well as the functions and priorities attached to it, different definitions of the investment budget were given.

It has been known as a quantitative expression of investment programs for a long-term future period approved by officials, and taken as a goal and basis for control to achieve the best investment of available resources. (Al-Taie, Al-Khurasan, 2016: 151)

Alternatively, it deals with organizing the planned investment expenditures for the investment unit by formulating its long- and short-term policies, creating an investment program figuring out how to fund it, and keeping an eye on how well it's being carried out. In other words, its goal is to plan and oversee investment initiatives that lead to the development and replacement of existing assets or the addition of new ones. Ancient Roots in harmony with Contemporary Technology Al-Anbari (2016), p. 27

Accordingly, the investment budget is a procedure whereby investment spending projects that are put forth by ministries and institutions are assessed. The most suitable and ideal project is then selected based on standards that allow for the most efficient use of resources and the rationalization of spending, after which it is incorporated into the ministry's or institution's plan. The researcher believes that investment budgets are not a balance between revenues and expenditures, as is the case in the state's general budget, but rather the amounts allocated for investment spending for governorates, ministries, entities not affiliated with a ministry, and other areas of spending.

Second: Financing the investment budget

Sources of financing the investment budget are the following:

1. The federal government's sovereign revenues, which make up over 90% of the general budget's revenues, are the source of the funds allotted to investment projects in the general budget. The oil sector accounts for the majority of this income.
2. Loans, where loans are used to finance general government spending, including investment spending. When there is a deficit in the general budget, the government resorts to borrowing, which may be internal from commercial banks and financial institutions within the country, or issuing bonds and transfers to government banks that are discounted at the Central Bank of Iraq, or through borrowing. External loans are represented by loans granted by international institutions such as the World Bank, the International Monetary Fund, or other international agencies, or the issuance of external bonds.

3. In addition to capital revenues, state property revenues, transfer revenues, and other services, other revenues are represented by customs duties, fines, and direct and indirect taxes. (2020, Daadoush, 199).

The second requirement

Analysis of the structure of investment spending in Iraq

First: Investment spending in Iraq

Investing is one of the most significant and efficient ways to alter the economy's structure and gauge the pace of social and economic advancement. The general budget of Iraq has an advantage in that operating spending has increased at the expense of investment spending.

We note from Table (2) that in the year 2004, investment expenditures were $3,503 million and their contribution to public expenditures was 15.19%. Despite the change that occurred after 2003 and the trend towards economic development, the investment budget did not meet the ambition and was very low compared to the current expenditures The remaining percentage is 84.81%. In the year 2005, investment expenditures increased to 5,122 million dollars, with a growth rate of 46.2% compared to the previous year 2004, and its contribution to public expenditures rose to 20.98%. The reason for the increase in the volume of investment spending was the increase in spending on infrastructure and reconstruction due to the devastation caused by the war.

Its share of public expenditures fell to 7.50% in 2006, and its growth rate dropped to 64.8%. Its total value dropped to 1,805 million dollars. The amount of investment spending climbed to $3,142 million in 2007, and its share of public spending jumped to 11.40% and continued to rise from there. Investment expenditures in 2008 amounted to $6,838 million, and their percentage of public expenditures also increased and amounted to 13.49%, but in 2009 they decreased to $2,926 million, and their proportion of public expenditures decreased to 6.51%. As we mentioned previously, this is a result of the repercussions of the global financial crisis, and after that, it began to rise. gradually until it reached $8,332 million in 2012 and its growth rate reached 33.1% compared to the year 2011 as a result of the stabilization of the political and security situation, in addition to the increase in the volume of public revenues resulting from the rise in oil prices in the international oil market.

In the year 2014, investment expenditures reached $21,381 million, but after that, They decreased in 2015 to 15,706 million dollars and the growth rate decreased to 26.5% due to the government's orientation towards fighting terrorism to achieve security and stability. Then it decreased in subsequent years until it reached 11,692 million dollars in 2018, and its rate decreased to 17% due to the decrease in oil revenues, despite Among the persistent efforts adopted by the government to increase investment spending in the general budget strategy for the years 2013-2017, however, the crisis of the decline in global oil prices in 2014 changed the government's directions to follow a policy of financial discipline based on reducing public spending, which negatively affected investment spending for the years 2015-2018.

In terms of the year 2019, the rise in oil prices led to an increase in the percentage of public expenditures to 21.86% and an increase in investment allocations to $20,662 million. This improvement was also accompanied by a decrease in military spending following the declaration of victory over ISIS. In 2020, the low price of oil coincided with the worldwide health crisis.

In addition to the weak planning and implementation of strategic projects, it decreased to 2,461 million dollars, its percentage decreased to 4.22%, and its growth rate was 88.1%, after it was 76.7% in 2019, and in 2021, it increased again and reached 9,188 million dollars, and the percentage rose to 12.95%, and the growth rate increased significantly. An estimated 273.4% compared to 2020.

Over the study period 2004-2021, the average ratio of investment spending to public expenditures reached 15.50%, which is considered a very low percentage, compared to the ratio needed by the Iraqi economy, whose production base and infrastructure have been neglected and destroyed since the ninth

decade of the twentieth century due to the conditions of the siege and wars.

This ratio shows that current spending dominates investment spending in the structure of public spending, reflecting the government's lack of interest in the latter despite its significance in raising rates of capital accumulation and expanding production capacity, both of which increase national income for a variety of reasons, most notably the security and political conditions the nation has faced.

Accordingly, investment spending is subject to oil prices and the amount achieved from oil revenues, and therefore any decrease in oil prices negatively affects investment spending and then the productive sectors towards a decline.

This percentage can be considered the main reason for the Iraqi economy remaining a unilateral rentier economy that relies on the extractive sector, not diversifying its production base, and remaining exposed to the outside world.

Year	Gross Domestic Product	Growth rate* GDP %	Crude oil prices	Growth rate Crude oil prices %	Oil sector	Contribution percentage The oil sector in GDP %
2004	36,463	-	36.50	-	21,102	57.9
2005	49,887	36.8	50.64	38.7	28,752	57.6
2006	68,719	37.7	61.80	22.0	37,996	55.3
2007	91,582	33.3	69.80	12.9	48,495	53.0
2008	133,981	46.3	94.45	35.3	74,374	55.5
2009	111,660	(16.7)	61.60	(35.4)	47,862	42.9
2010	138,517	24.1	77.45	27.0	62,312	45.0
2011	185,750	34.1	107.46	38.7	99,145	53.4
2012	218,032	17.4	109.45	1.9	109,113	50.0
2013	234,638	7.6	105.87	(3.3)	108,444	46.2
2014	228,491	(2.6)	96.29	(9.0)	100,650	44.0
2015	164,705	(27.9)	49.49	(48.6)	55,492	33.7
2016	166,602	1.2	43.70	(11.7)	57,358	34.4
2017	187,218	12.4	52.43	20.0	75,224	40.2
2018	227,512	21.5	69.78	33.1	102,044	44.9
2019	233,636	2.7	64.00	(8.3)	97,150	41.6
2020	168,534	(27.9)	41.80	(35.2)	46,827	27.8
2021	207,889	23.4	69.89	68.4	94,947	45.7
	2,853,816				**1,267,285**	

Table (2) Structure of public expenditures in Iraqi budgets for the period (2004-2021) (million dollars)

Source: Central Bank of Iraq, General Directorate of Statistics and Research, annual bulletins, for the period from 2004-2021, available on the website http://www.cbi.iq

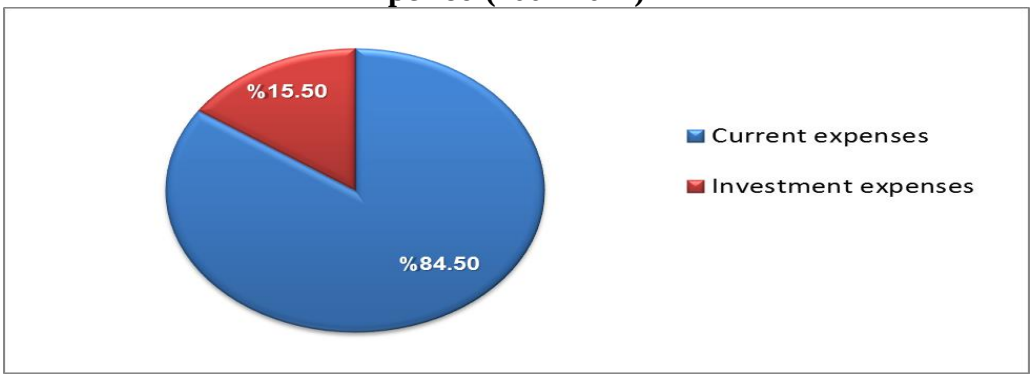
*Growth rate or percentage of change = current year - previous year / previous year * 100

*Amount of change = current year - previous year / previous year

Figure (1) shows that investment spending constitutes a low percentage of total public spending, as it constituted 15.50%, while current spending constituted approximately 84.50%, as an average for the period of the study (2004-2021).

The majority of investments are marginal and remote from productive capacity, despite the imbalance in the structure of public spending favouring current expenditures and the inadequacy of investment spending; we will attempt to clarify this in more depth in the second criterion.

Figure (1) The ratio of current and investment expenditures to public expenditures in Iraq for the period (2004-2021)



Source: From the researcher's work based on Table (2)

Second: The relationship between oil revenues and current and investment expenditures

Table (3) shows that investment expenditures increase in tandem with rising oil revenues and fall in tandem with declining oil revenues. The increase in oil prices caused an increasing trend in oil revenues from 2004 to 2008; however, the collapse in oil prices in 2009 resulted in a decrease in oil income.

Next, it increased between 2010 and 2013, then fell in 2014 as a result of ISIS, with the majority of investment spending going toward military expenditures to ensure security and stability. Then, in 2017, spending increased as a result of higher oil prices and the defeat of ISIS, which more than compensated for lower military and security spending. The amount spent on investments climbed marginally in 2019 and increased in tandem with rising oil prices and oil earnings. Plans for economic development, as well as investments and service initiatives, are contingent on oil prices and their volatile earnings due to the volatility and compromise between investment spending and oil prices.

Table (3) The relationship between oil revenues and current and investment expenditures in Iraq for the period (2004-2021)

(Million dollars)

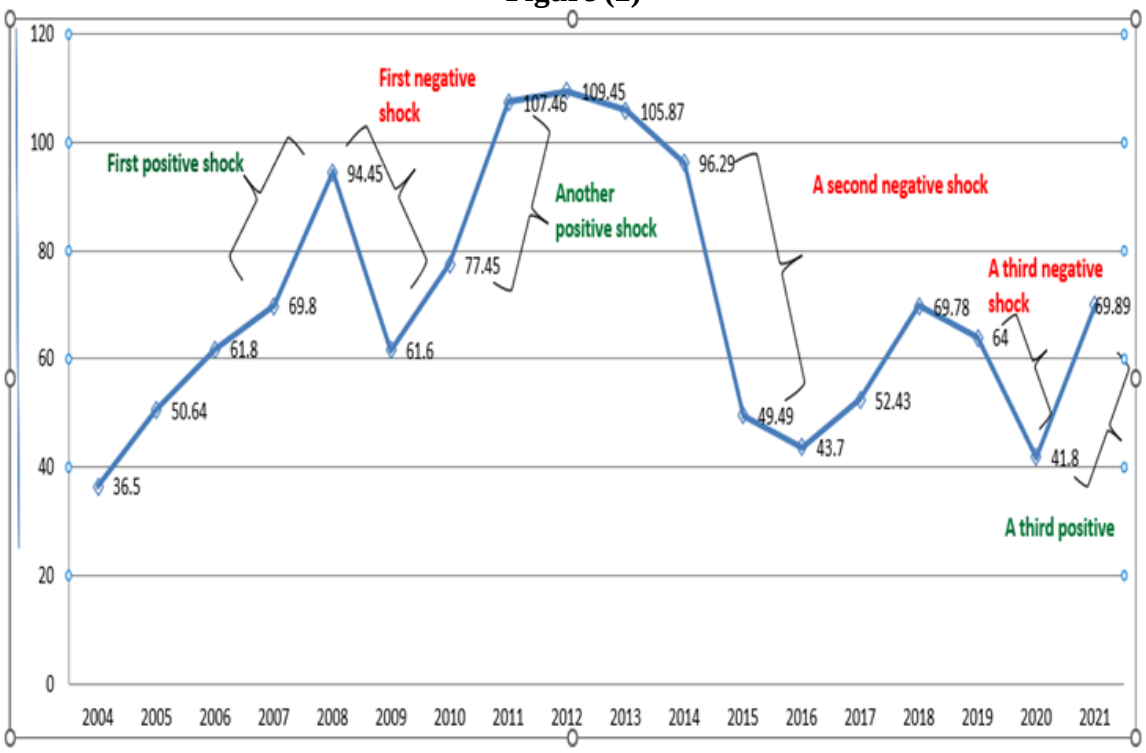
Year	Crude oil prices barrel/$	Unemployment rate	Growth rate or percentage of change in % unemployment rates
2004	36.50	26.8	/
2005	50.64	18.0	(32.8)
2006	61.80	17.5	(2.8)
2007	69.80	11.7	(33.1)
2008	94.45	15.3	30.8
2009	61.60	14.0	(8.5)
2010	77.45	12.0	(14.3)
2011	107.46	8.2	(31.7)
2012	109.45	11.9	45.1
2013	105.87	9.3	(21.8)
2014	96.29	10.6	14.0
2015	49.49	10.7	0.9
2016	43.70	10.8	0.9
2017	52.43	13.8	27.8
2018	69.78	12.9	(6.5)
2019	64.00	12.8	(0.8)
2020	41.80	13.7	7.0
2021	69.89	16.5	20.4

Source: Central Bank of Iraq, statistical website, financial sector, for the years 2004-2021, available on the website: https://cbiraq.org/SubCategoriesTable.aspx

If we look at the nature of spending in general, we see that there is a clear imbalance in terms of increasing current spending at the expense of investment spending, as whenever oil revenues decrease, in most cases, the resort is made to reducing current expenditures, but to a lesser extent than reducing investment expenditures, meaning sacrifice is usually made. With investment expenditures, we also notice that investment expenditures go almost parallel to oil revenues, while current expenditures, in some years.

We note that they exceed oil revenues because, in some cases, the investment budget is cut to increase current expenditures because of the presence of new or emergency priorities like security, the epidemic, or the appointment of the unemployed, among other such matters (Khudair, Shaker, Judeh, 2022: 229). This can be expressed in the form (2) below. The year 2020 and 2016 were examples of these years when this happened due to social pressures that prevented the budget from being cut.

Figure (2)



Source: From the researcher's work based on Table (3)

The third topic

Measuring the impact of oil price fluctuations on investment budgets using the ARDL methodology

One of the modern dynamic modelling methods to ascertain the relationship between economic variables and adopt the standard method in forming the model, the autoregressive distributed lag (ARDL) methodology is used in this study to analyze the relationship between investment spending in Iraq and fluctuations in oil prices in global markets. A suite of statistical programs was utilized in the process. ARDL methodology will be briefly reviewed, the model between the economic variables will be explained, it will be estimated, and the test results will be interpreted. Eviews12 will be used for analysis. My organizations:

The first requirement

Concept of ARDL methodology and standard model description

First: A brief overview of the ARDL (Autoregressive Distributed Lag Model) methodology.

Pesaran (1997), Shinand & Sun (1998), and Pesaran et AI (2001), developed a new methodology known as Autoregressive with Distributed lags, which combines two models: the Autoregressive Model and Distributed Lags Model. It has an abbreviation of (ARDL) and the Ardell model is one of the best methods of co-integration dynamic modelling that has been used recently, as this model provides a way to introduce time-lagged variables as independent variables in the model (Khalil, Dombrecht, 2011, 2).

The ARDL model has a set of characteristics:

1. It takes a sufficient number of lags to obtain the best data set.
2. It helps to estimate the short-term relationship between the variables contained in the model, therefore utilizing a basic linear transformation, an error correction model can be generated through it. As a result, this model can measure the parameters of the independent variables. (Khurshid Haider, 2019: 98–99).
3. Using the ARDL model, it is possible to estimate the long- and short-term parameters simultaneously with the explanatory variables of the model with different lag periods.
4. In conventional cointegration tests, where larger sample sizes are necessary for more accurate findings, the model performs better when dealing with short time series than other models. Abid Obaid (2022: 312).
5. It is not necessary that the time series be integrated of the same order (0)1 or the first order (1)1, provided that it is not integrated of the second order (2)1 only.
6. The ARDL model provides more consistent estimates of the long and short terms than other methods, and it can be used to find the complementary relationship between the independent and dependent variables in the same equation. It can also be used to estimate the size of each independent variable's effect on the dependent variable. (2023; Muhammad, 267–268).
7. The parameters estimated according to this model in the short and long term are better consistent than those parameters estimated in other models such as the Engel-Kranger method, the Johansen method, and the Gesselius method. (Al-Subaihi, Al-Muhammadi, Al-Ani, 2021: 396-397).
8. ARDL presents a modern approach to testing co-integration under the unrestricted error correction model, known as the bounds Testing Approach. (Issa, Ismail, 2018: 252)

Particularly in time series models, there exists a lag between the economic decision and the ultimate effect of altering the economic policy variable, particularly when the lag is extended. In this instance, the independent variable's time lag factor must be included because it influences economic analysis techniques both short- and long-term, in addition to other factors about institutional or technical issues, customs, traditions, and other issues (Sheikhi, 2011: 75). As a result, the distribution of the change in the dependent variable (Yt) and the change in the independent variable (Xt) over time is wide.

If there is a significant lag between the response and the effects, the dynamic response model must be constructed by incorporating the time-lagged explanatory variables as explanatory variables, which denotes that the explanatory variable's effect extends beyond the current period (t) to several prior periods. (t-r), where r is the duration of the time delay.

To estimate the ARDL model, the following steps are required:

1. Examine the data, then use the extended Dickey-Fuller (ADF) and Phelps-Perron (PP) unit root tests to establish the order of the time series' integration and test for stability. If necessary, confirm that the time series is stable up to degree l(0) or l(1).
2. Determine the optimal slowdown periods using an unrestricted autoregressive (VAR) model.
3. Estimate the ARDL model, and conduct a bounds test to find out whether there is a long-run

cointegration relationship.

4. Ensure that there is no serial link problem (self-linking), and if the presence of a serial link problem is discovered, the problem is addressed by increasing the slowdown periods or using (HAC).
5. Estimating the error correction factor model.
6. Testing the causal relationship in the short term and the long term.

Second: Description of the standard model used

The stage of describing the model is one of the most important and difficult stages of building the standard model, through what it requires of specifying the variables that must be included in the model or that must be excluded from it. At this stage, economic theory is used to transform the relationship into mathematical equations using symbols to determine the type and direction of the relationship between Economic variables (Bakhit, Fathallah, 2006: 28), and the Iraqi economy is described as a rentier economy par excellence, as the oil sector contributes 46% of the gross domestic product, oil revenues constitute 92% of total public revenues, and oil exports constitute 98% of the total General exports, as an average for the period of the study (2004-2021), on the one hand. On the other hand, oil prices in global markets are characterized by instability and continuous fluctuations, which is reflected in the state's general budget in general and investment budgets in particular.

Based on the aforementioned, it can be concluded that there was a direct correlation between changes in the price of oil on international markets and investment spending in Iraq over the study period.

Description of the model used is the first step in building standard models, as the standard model used in the study is based on two basic variables:

1. Investment budgets: expressed in investment expenditures as a dependent variable in the model and symbolized by (I).
2. International oil prices: expressed as the average price of the OPEC basket as an independent variable in the model and symbolized by (O).

It is anticipated that there will be a positive correlation between the two variables, i.e., that changes in investment budgets follow changes in global oil prices, or that declines in oil prices on international markets cause decreases in investment budgets and vice versa. Thus, the following formula can be used to express the relationship between the two variables:

$I = \alpha_0 + \beta O + \mu t$

After taking the natural logarithm of the variables, the equation becomes according to the following formula:

$Ln\ I = \alpha_0 + B\ lnO + \mu t$

whereas:

I ln: logarithm of investment expenditures

α: Constant

β: Oil price parameter, which expresses the percentage of the impact of oil prices on investment expenditures

O ln: independent variable (international oil prices)

μt: The random variable that includes the effect of other variables not included in the model

Information about the model variables was gathered from OPEC reports on oil prices as well as Central Bank bulletins and data on investment expenditures in Iraq during the study period.

The second requirement

Estimating the standard model and interpreting the results

We do the following actions to estimate, within the context of the ARDL approach, the relationship between changes in the world oil price and investment budgets:

First: unit root tests

Time series of economic variables are usually unstable and include a time trend, which makes the estimation and regression process biased and thus inaccurate results are obtained. To reach correct and consistent results, unit root tests must be conducted for the study variables to ensure that they are stable, free of unit roots and that they are integrated Of degree I(0) or of degree I(1) provided that it is not integrated of degree I(2) because the ARDL methodology requires that the time series be stable at the level or the first difference or a mixture of both. Unit root tests attempt to test the following hypotheses:

H0: Null hypothesis: Non-stationarity of time series of variables

H1: Alternative hypothesis: Time series stability of variables

If either the value of (calculated t) exceeds the value of (tabular t) or the probability value (Prob.) is less than 5%, the time series is stable and devoid of unit roots. Here, the alternative hypothesis is accepted and the null hypothesis is rejected, and vice versa.

There are several unit root tests, the most important of which are: (Gujarat, 2015: 1051-1052)

Dickey-Fuller test

Phillips-Perron (PP) test

Tables (4) and (5): show the results of the Dickey-Fuller developer, Phelps-Perron and Agati tests:

1. The investment expenditure variable (LNI) series is unstable at the level; however, it stabilizes at a significant level (1%, 5%, 10%) and with a constant slope, constant and trend, or without constant and trend after taking the first difference.
2. The global oil price (LNO) variable series is unstable at the level, but it stabilizes after taking the first difference with a constant slope only at the 5% level, with a constant slope and trend at the 10% level, and regression without a constant and trend, at a significance level (1%, 5%, 10%).

Table (4) Unit root test results according to the developed Dickey-Fuller test (ADF).

Rank	Dickey-Fuller test (ADF) developed						%	Variables
	difference At the first			At the level				
	without	Constant and directional	Fixed	without	Constant and directional	Fixed		
I(1)	2.71	4.66	3.92	2.71	4.61	3.88	%1	LNI
	1.96	3.73	3.06	1.96	3.71	3.05	%5	
	1.6	3.31	2.67	1.6	3.29	2.66	%10	
	7.07	**6.68**	**6.82**	**0.03**	**3.24**	**2.6**		t - statistic
I(1)	2.71	4.66	3.92	2.71	4.61	3.88	%1	LNO
	1.96	3.73	3.06	1.96	3.71	3.05	%5	
	1.6	3.31	2.67	1.6	3.29	2.66	%10	
	3.8	**3.46**	**3.68**	**0.31**	**2.65**	**2.66**		t - statistic

Source: From the researcher's work based on the results of EVIEWS12.

Table (5) Results of the unit root test according to the Phelps-Perron (PP) test

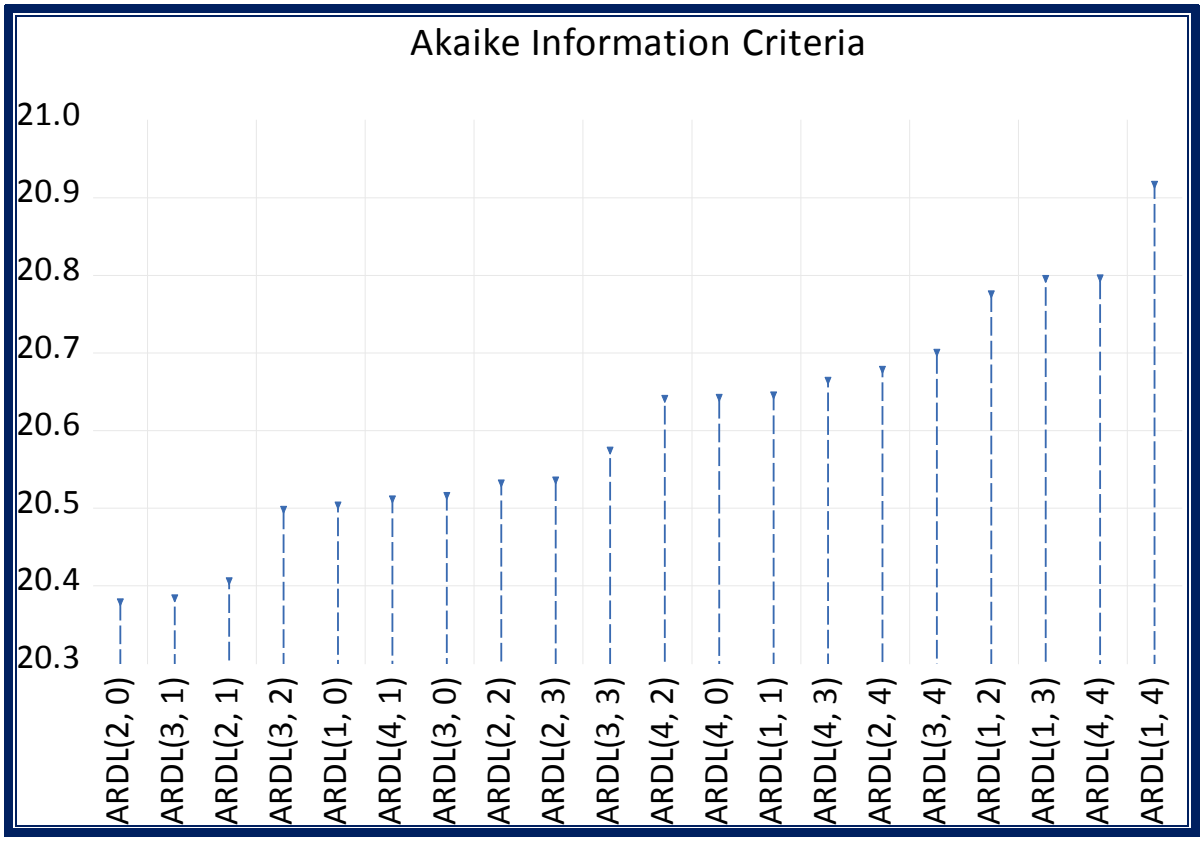
Rank	Phelps-Perron test (PP)						%	Variables
	At the first difference			At the level				
	without	Constant and directional	Fixed	without	Constant and directional	Fixed		
I(1)	2.71	4.66	3.92	2.7	4.61	3.88	%1	LNI
	1.96	3.73	3.06	1.96	3.71	3.05	%5	
	1.6	3.31	2.67	1.6	3.29	2.66	%10	
	7.48	**7.14**	**7.15**	**0.77**	**3.24**	**2.52**		t - statistic
I(1)	2.71	4.66	3.92	2.7	4.61	3.88	%1	LNO
	1.96	3.73	3.06	1.96	3.71	3.05	%5	
	1.6	3.31	2.67	1.6	3.29	2.66	%10	
	3.68	**3.28**	**3.69**	**0.45**	**2.63**	**2.63**		t - statistic

Source: From the researcher's work based on the results of EVIEWS12.

Second: Determine the optimal slowdown periods for the ARDL model

The Akaike Information Criteria determined that the ARDL (2.0) model, which specifies two lag periods for the dependent variable (investment expenditures) and a zero lag period for the independent variable (international oil prices), was the best model out of 20 models. The ARDL model is distinguished by its automatic selection of lag periods. As seen in the following figure:

Figure (3) The optimal deceleration periods for the ARDL model are according to the (AIC) standard.



Source: Eviws12 software package results

The results of estimating the ARDL model (2.0) are displayed in Table 6; the value of Prob indicates that the parameters are significant and consistent with economic theory. It is less than 5% for the variables, and the value of the coefficient of determination (R2) indicates that the independent variable—international oil prices—explains 47% of the variation in investment budgets. Additionally, the Durbin-Watson test, which has a value of (2.0), indicates that the model is not affected by autocorrelation. Given that the probability value of the F test is less than 5%, the model's quality is very good in the acceptance domain.

Table (6) ARDL model estimation (2,0)

Dependent Variable: LNI
Method: ARDL
Date: 10/07/23 Time: 02:39
Sample (adjusted): 2006 2021
Included observations: 16 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): LNO
Fixed regressors: C
Number of models evalulated: 20
Selected Model: ARDL(2, 0)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNI(-1)	0.469100	0.228227	2.055409	0.0623
LNI(-2)	0.695758	0.237143	2.933916	0.0125
LNO	1.743341	0.592976	2.939989	0.0124
C	-8.850401	4.594807	-1.926175	0.0781

R-squared	0.583877	Mean dependent var	8.898608
Adjusted R-squared	0.479847	S.D. dependent var	0.770494
S.E. of regression	0.555693	Akaike info criterion	1.875116
Sum squared resid	3.705534	Schwarz criterion	2.068263
Log likelihood	-11.00092	Hannan-Quinn criter.	1.885006
F-statistic	5.612552	Durbin-Watson stat	2.044835
Prob(F-statistic)	0.012203		

Source: Eviws12 software package results

Third: Testing the suitability and quality of the model used

There is a set of diagnostic tests to detect the quality of the estimated model, which are:

1. Normal distribution of Jarque Bera series of residues

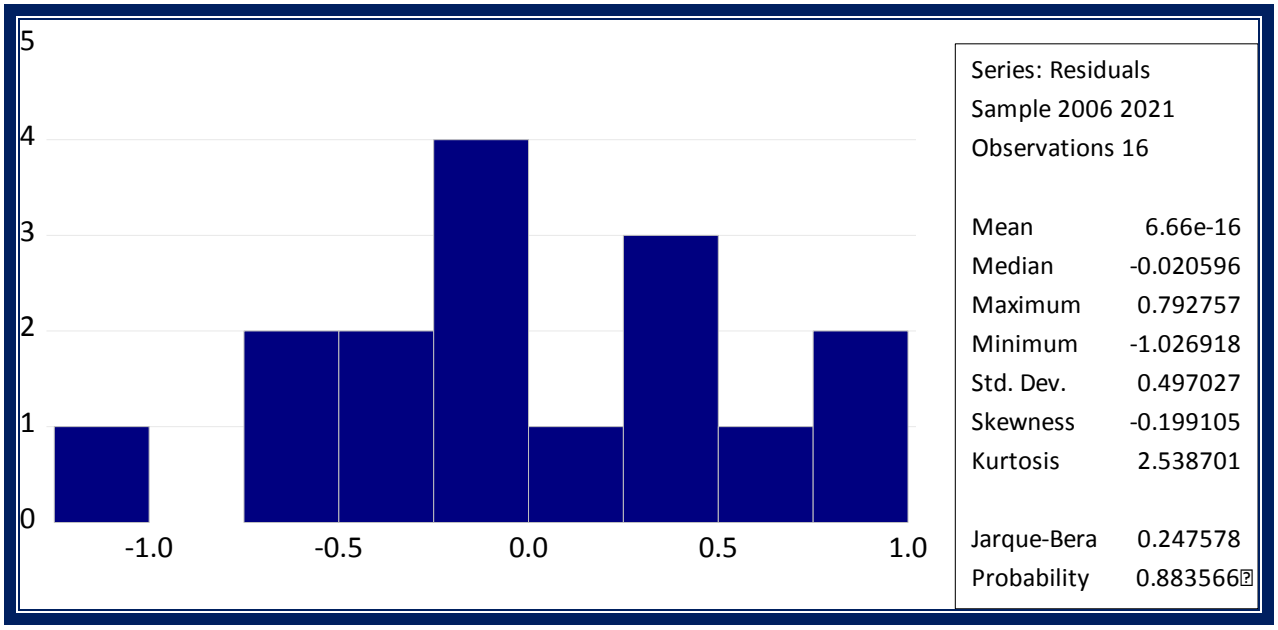
The Jarque Bera test is the appropriate test to detect whether the residual series follows a normal distribution or not, by testing the following hypotheses:

H0: Null hypothesis: There is no problem with normal distribution of the residual series

H1: Alternative hypothesis: There is a problem with the normal distribution of the residual series

Figure (4) demonstrates that the probability value of the (JB) test is equal to (0.88), which is larger than 5% and implies that the null hypothesis must be accepted and the alternative hypothesis must be rejected. This suggests that the residual series is normally distributed.

Figure (4) Choosing a normal distribution problem Jarque Bera



Source: Eviws12 software package results

2. Self-correlation of the remainder series

Since the LM test permits testing autocorrelation to a degree greater than the first degree, it is a suitable test to determine whether autocorrelation exists in a sequence of residuals. It can also be used to determine whether time lag factors are present or not. It is appropriate for testing the following hypotheses with both small and big samples:

H0: Null hypothesis: There is no autocorrelation for the series of residuals

H1: Alternative hypothesis: There is autocorrelation for the series of residuals

The probability value of the F-Statistic for the (LM) test, equal to (0.8532) (i.e., larger than 5%), is not significant, as Table (7) demonstrates. This necessitates adopting the null hypothesis, which asserts that the series of residuals has no autocorrelation.

Table (7) Autocorrelation Problem Test (LM-Test)

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.161277	Prob. F(2,10)	0.8532
Obs*R-squared	0.499960	Prob. Chi-Square(2)	0.7788

Source: Eviws12 software package results

3. Testing the problem of heteroscedasticity

The following theories are tested by the Breusch-Pagan-Godfrey test, which is the proper test to use for detecting the issue of heterogeneity of variance for a sequence of residuals:

H0: Null hypothesis: There is no homoscedasticity problem for the residual series

H1: Alternative hypothesis: There is a problem of homogeneity of variance for the residual series

As can be seen in Table (8), the test's F-Statistic probability value of 0.1337, which is larger than 5% and indicates that the test is not significant, necessitates accepting the null hypothesis, which claims that the residual series' homogeneity of variance is unaffected.

Table (8) Testing the homogeneity of the variance problem

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	2.260714	Prob. F(3,12)	0.1337
Obs*R-squared	5.777524	Prob. Chi-Square(3)	0.1230
Scaled explained SS	2.500279	Prob. Chi-Square(3)	0.4752

Source: Eviws12 software package results

4. Model Structure Stationary Tests

The best-suited tests to find out if the model data is free of any structural changes that could impair the quality of the estimated model are the Cumulative Sum of Residuals (GUSUM) test and the GUSUM OF Squares test. The ARDL methodology (Hamad, Mahmoud, Hassan, 2021: 473) is always used in conjunction with these tests, which are regarded as some of the most significant in this field because they provide clarity on two key issues: whether there is any structural change in the data and the degree of stability and consistency of the long-term parameters with the short-term parameters. These tests test the following hypotheses:

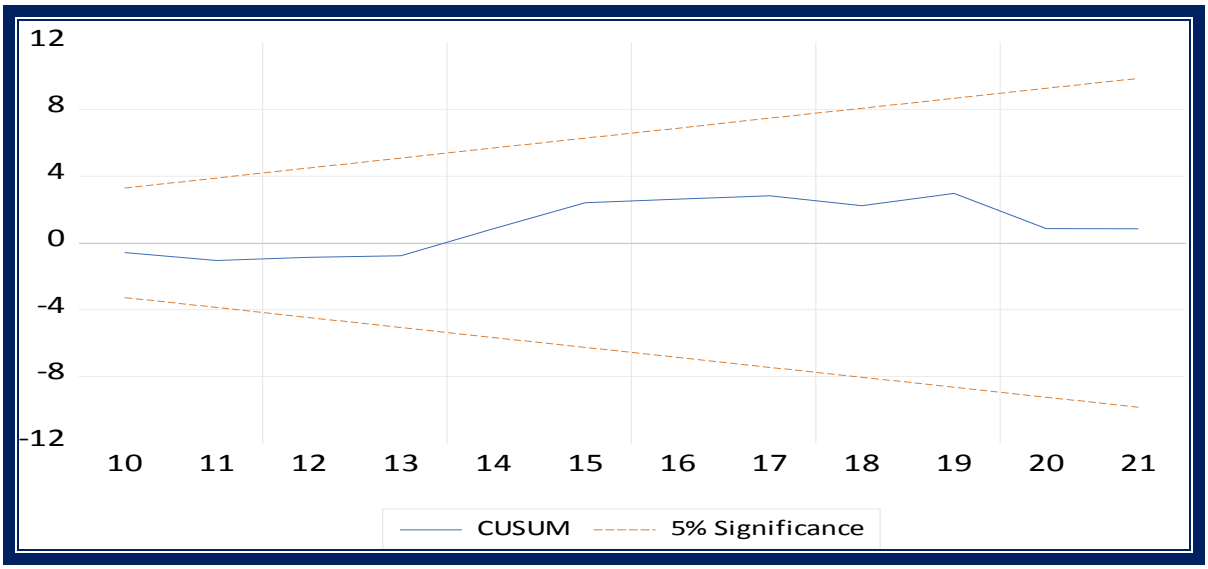
H0: Null hypothesis: There is no problem with structural changes (stability of the model)

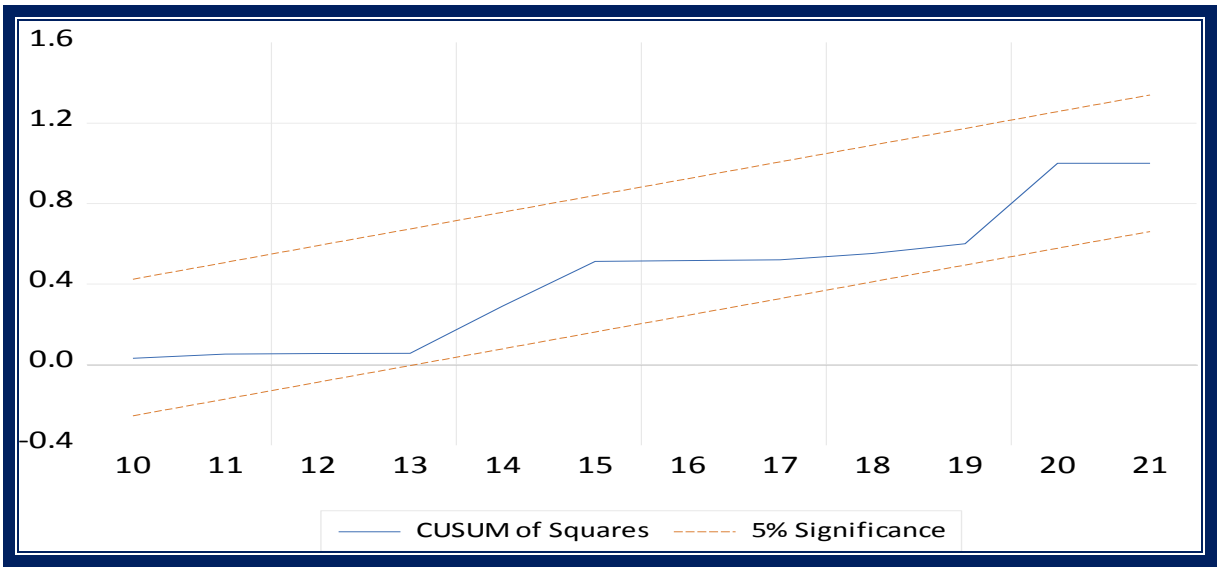
H1: Alternative hypothesis: the existence of the problem of structural changes (instability of the model)

If the curve of both GUSUM & GUSUM OF Squares falls between the critical value limits, the null hypothesis will be accepted and the model will be stable.

It appears from Figure (5) that the curve lies between the critical values, which means that the estimated model ARDL (2.0) is stable and can be relied upon in estimating the long-term and short-term relationships between global oil prices and investment budgets.

Figure (5) Testing the structural stability of the model





Source: Eviws12 software package results

Fourth: Co-integration test (bounds test) for the long term (Bounds Test)

The Bounds Test is used to detect the existence of a long-term equilibrium relationship between model variables within the framework of the ARDL methodology. This is done by testing the following hypotheses:

H0: Null hypothesis: There is no long-term equilibrium relationship between the model variables

H1: Alternative hypothesis: The existence of a long-term equilibrium relationship between the model variables

There is no cointegration between the variables if the F-statistic value is less than the lower bounds of the critical values; on the other hand, cointegration between the variables is indicated if the F-statistic value is greater than the upper bounds of the critical values. If the F-Statistic value occurs between the lower and upper bounds of the critical values, this indicates an area where the question of cointegration between the model variables remains unresolved.

Table (9) indicates that, at the 5% level of significance, the F-Statistic value is equal to (3.85) and falls between the bottom and higher bounds of the critical values. Consequently, the existence of long-term cointegration between global oil prices and investment budgets precludes the ability to make a firm decision. Provide the following justification for this:

- Fluctuations in oil prices are reflected in annual investment budgets
- In the event of a decline in oil prices and a deficit in public budgets, it is financed through internal and external borrowing and thus hides the impact of fluctuations in oil prices on investment budgets.

Investment depends on other important variables, such as financial and administrative corruption and the country's absorptive capacity

As a result, it is impossible to make a firm decision because investment budgets have a long-term impact on changes in the price of oil globally. However, given that the Iraqi economy depends heavily on oil sector revenues, it is also impossible to say with certainty that oil prices won't have an impact on investment budgets.

Table (9) Bounds Test

F-Bounds Test Null Hypothesis:No Levels of relationship				
Test Statistic	**Value**	**Signif.**	**I(0)**	**I(1)**
F-Statistic	3.856065	10%	3.02	3.51
K	16	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58

Source: Eviws12 software package results

Fifth: Error Correction Model (ECM) ARDL Error Correction Model

The error correction model (ECM), which assumes a negative and substantial value for the error correction parameter, displays the speed needed in the short term to correct the imbalance in the long run.

The error correction model's results are displayed in Table (10) and indicate that the error correction parameter is significant since the imbalance cannot be addressed over the long run, as indicated by the positive CointEq (-1) * (0.164858) value of Prop. Less than 5%. This is because the source of the imbalance is an external variable (global oil prices), which is influenced by a wide range of environmental, political, and economic factors, some of which are very difficult to regulate.

Table (10) Error Correction Model (ECM)

ARDL Error Correction Regression
Dependent Variable: D(LNI)
Selected Model: ARDL(2, 0)
Case 2: Restricted Constant and No Trend
Date: 10/07/23 Time: 03:38
Sample: 2004 2021
Included observations: 16

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNI(-1))	-0.695758	0.170460	-4.081654	0.0015
CointEq(-1)*	0.164858	0.044875	3.673721	0.0032

R-squared	0.657309	Mean dependent var	0.036522
Adjusted R-squared	0.632831	S.D. dependent var	0.849040
S.E. of regression	0.514472	Akaike info criterion	1.625116
Sum squared resid	3.705534	Schwarz criterion	1.721689
Log likelihood	-11.00092	Hannan-Quinn criter.	1.630061
Durbin-Watson stat	2.044835		

* p-value incompatible with t-Bounds distribution.

Source: Eviws12 software package results

Sixth: Testing the causal relationship in the short-term

Table (11): Results of the Granger causality test between global oil prices and short-term investment budgets, where the following null hypotheses were tested:

The first hypothesis: global oil prices (LNO) do not affect investment budgets (LNI)

The second hypothesis: Investment budgets (LNI) do not affect global oil prices (LNO)

Since the first hypothesis's probability value is not significant, the null hypothesis must be rejected and the alternative hypothesis—that is, that changes in global oil prices throughout the study period have an impact on investment budgets—must be accepted. As a result, the results were consistent with economic reality.

As for the probability value of the second hypothesis, it was significant, which requires accepting the null hypothesis, which states that investment budgets in Iraq do not affect global oil prices.

Table (11) Error Correction Model (ECM)

Pairwise Granger Causality Tests
Date: 10/07/23 Time: 03:46
Sample: 2004 2021
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
LNO does not Granger Cause LNI	16	1.29416	0.3128
LNI does not Granger Cause LNO		5.33248	0.0240

Source: Eviws12 software package results

First: Conclusions

From what was presented, some of the following conclusions can be summarized:

- The overall budget of Iraq was typified by a rise in the amount allotted to operating or current expenses, relative to a fall in the amount allocated to investment expenses. This resulted in a downturn in all economic sectors and their incapacity to satisfy the demands of the local market, which in turn fueled the trend of importing goods from overseas to bridge the gap in domestic consumer demand.
- The main reason for the Iraqi economy to remain a unilateral rentier sector that depends on the extractive sector not to diversify its production base and to remain exposed to the outside world is the low percentage of investment spending allocations, which amounted to 15.50%, compared to the percentage needed by the Iraqi economy, whose production base and infrastructure have been neglected and destroyed. Since the ninth decade of the twentieth century due to the conditions of siege and wars.
- Whenever oil revenues decrease, it is often resorted to reducing current expenditures, but to a lesser extent than reducing investment expenditures, meaning the sacrifice is usually made on investment expenditures. We also notice that investment expenditures go almost parallel to oil revenues, while current expenditures, in some years, we notice that they are more Of oil revenues, this is because the difference is compensated by borrowing or financial surpluses from previous years.
- The study's hypothesis regarding how changes in oil prices reflect on investment budgets is supported by the research findings, which were obtained through the use of the ARDL model, the Eviews12 statistical software package, and analysis of the test results. At least in the short term, there is a causal relationship between changes in oil prices and investment budgets.
- One of the characteristics of the Iraqi economy is its reliance to a large degree on oil revenues as a main source of financing public spending, which has led to a decline in the relative importance of the rest of the economic sectors in contributing to financing the general budget, which has caused a decline in other revenues.

Second: Recommendations

- The need to increase tax collections and investment spending to rationalize public spending and diversify sources of funding, as this would help finance the general budget.
- Work to invest in the financial surpluses resulting from the rise in crude oil prices by undertaking long-term strategic investment projects.
- Activate and revitalize the non-oil economic sectors and work to increase their contribution to the formation of the gross domestic product, especially the manufacturing sector and the agricultural sector.
- the requirement to allocate more funds for investments to expand production capacity and construct essential infrastructure, which will serve as the foundation for the necessary economic growth.
- Investment priorities must be determined in any budget because current investment budgets are lost between ongoing corruption, unstable security, and terrorism so nothing remains for real investment.
- A new mechanism must be found to remove the link between oil prices and determine the price of oil that is approved in the general budget.

REFERENCES:

1. Amal, Hamozrouqi, (2021) An analytical study of the repercussions of the Corona pandemic on global oil prices, Journal of Contemporary Economic Studies, Mohamed Boudayef University, Faculty of Economic and Commercial Sciences, Algeria, Volume 6, Issue 1.
2. Abadi, Mustafa Al-Kazemi Al-Najafi and Al-Tamimi, Ali Thajil Yousef (2019), Analysis of the impact of fluctuations in crude oil prices in the international market on public revenues in the Iraqi economy for the period (2003-2015), Lark Journal of Philosophy and Social Sciences, No. 34.
3. Bakhit, Hussein Ali and Fathallah, Sahar, (2006), Econometrics, Amman, Jordan, Al-Yazouri Scientific Publishing and Distribution House.
4. Jijarati, Damodar, (2015), Econometrics, Part Two, (Arabization and translation, Odeh, Hind Abdel Ghaffar), Kingdom of Saudi Arabia, Al-Marreikh Publishing House.
5. Al-Janani, Ammar Naeem Zaghir and Al-Jabri, Qusay Abboud Faraj, (2020), The impact of crude oil price fluctuations on the financial policy response in Iraq for the period 1990-2017, Al-Mustansiriya University, College of Administration and Economics, Journal of Petroleum Research and Studies, No. 28.
6. Hamza, Bashir Dohan, and Muhammad, Muhammad Naji (2022) Financial discipline in Iraq in light of oil price fluctuations for the period 2003-2020, Journal of the College of Management and Economics for Economic, Administrative and Financial Studies, University of Karbala, Volume 14, Issue 3.
7. Haider, Khalid and Khurshid, Faisal Ali, (2019), The role of human capital in the growth of the Iraqi economy for the period (1980-2016), Scientific Journal of Cihan University, Sulaymaniyah, Volume 3, Issue 1.
8. Hamad, Makhif Jassim and Mahmoud, Muthanna Mayouf and Hassan, Fouad Farhan, (2021), measuring and analyzing the impact of external debt on GDP in Morocco for the period (1990-2017) using the ARDL model, University of Baghdad, College of Administration and Economics, Journal of Economic and Administrative Sciences.
9. Khudair, Hamid Abdul Hussein and Shaker, Ibtihal Nahi and Judeh, Shaima Jabbar, (2022), Analysis of the relationship between government investment spending and human development in

Iraq for the period (2006-2019), Warith Al-Anbiya University, College of Administration and Economics, Warith Scientific Journal, vol. 4, issue 10.

10. Khalidia, Ben Awali, (2016), The Use of Oil Revenues: A Comparative Study between the Algerian Experience and the Norway Experience, Master's Thesis, Faculty of Economic and Commercial Sciences, University of Oran 2, Algeria.
11. Daadoush, Ali Abdel Kazem, (2020), Oil Prices and OPEC Countries (An Opposing Relationship), First Edition, Baghdad, Al-Dhad Library for Publishing and Distribution.
12. Ziara, Rahim Hassouni and Naji, Murtada Hadi Jundi, (2020), an analytical study of the impact of fluctuations in crude oil prices in the international market on inflation and economic growth in Iraq for the period (1990-2014), University of Baghdad, College of Administration and Economics, Dinar Magazine, Issue 18.
13. Sheikhi, Muhammad, (2011), Lessons and Solved Examples in Econometrics, first edition, Kasdi Merbah University - Ouargla, Algeria.
14. Al-Subaihi, Ali Nabaa Sayel, Al-Muhammadi, Nazim Abdullah Abdel, Al-Ani, Ahmed Hussein Battal, (2021) Measuring the sources of inflation in the Iraqi economy using the Autoregressive Lag Distributed Time Laps (ARDL) model for the period (1970-2018), Journal of the University College of Knowledge, Volume 32, Issue 2.
15. Al-Taie, Asaad Khalil Lazem and Al-Khursan, Muhammad Helou Daoud, (2016), Evaluation of external control procedures on investment budget projects for local governments, applied research in the local government of Dhi Qar Governorate, University of Baghdad, Journal of Accounting and Financial Studies, College of Administration and Economics, vol. 11, Issue 34.
16. Al-Ta'i, Abd al-Rahman Karim Abd al-Rida and al-Maksusi, Dr Rahman Hassan Ali (2018), Analysis of the reality of the relationship between global oil prices and economic growth, Iraq, a case study for the period (1970-2015), Wasit University, College of Administration and Economics, Wasit Magazine, Volume 14, Issue 1.
17. Issa, Saad Saleh and Ismail, Attiya Muhammad (2018), Measuring the impact of trade openness on economic growth in Iraq for the period (2003-2016) using the ARDL model, Tikrit University, College of Administration and Economics, Tikrit Journal of Administrative and Economic Sciences, Volume 3, No. 43.
18. Allawi, Saimaa Mohsen, (2019) The decline in global oil prices and its impact on the preparation of the general budget for Iraq, Iraqi University, College of Administration and Economics, No. 17.
19. Obaid, Muhannad Khalifa and Obaid, Taiba Abbas, (2022) The impact of financial discipline indicators on economic growth in Iraq: An econometric study using the ARDL model for the period (2004-2020) Journal of the University College of Knowledge, Volume 33, Issue 4.
20. Faraj, Sakna Jahiya, (2015), Factors affecting global oil prices and their impact on the economies of the Gulf Cooperation Council for the period (2003-2014), University of Basra, Center for Basra and Arabian Gulf Studies, Gulf Economic Journal, No. 26.
21. Al-Kanani, Ammar Naeem, Al-Jabri, Qusay Abboud Faraj, (2021) Estimating the returns and risks of oil price fluctuations in the international market for the period 1990-2017, Journal of Petroleum Research and Studies, Al-Mustansiriya University, College of Administration and Economics, No. 21.
22. Al-Marsoumi, Nabil Jaafar Abdel-Rida, (2011), Oil Economy, first edition, Beirut, Arab Heritage Revival House for Printing, Publishing and Distribution.
23. Mohamed, Ghazghazi, (2023), The role of the knowledge economy in supporting the growth of the

manufacturing sector in Algeria during the period (1990-2021), an econometric study using the ARDL model, University of Blida 2, Creativity Magazine, Algeria, Volume 13, Issue 1

24. Mustafa, Mellat Arshad, (2021), Forecasting global oil prices for the year 2021 and their economic impacts in light of the new Corona pandemic - Iraq case study, Master's thesis, Near East University, Institute of Graduate Studies, Faculty of Economic and Administrative Sciences, Nicosia.
25. Organization of Arab Petroleum Exporting Countries (OAPEC), annual reports of the Secretary-General, from 2004 to 2021.
26. Iraq Extractive Industries Transparency Initiative (IEITI), Annual Report 2019-2020, available online http://eiti.org.iq/ar/details
27. Al-Muzaini, Imad al-Din Muhammad, (2013), Factors that affected fluctuations in global oil prices, Al-Azhar University Journal, Gaza, Human Sciences Series, Volume 15, Issue 1.
28. Al-Nasrawi, Ali Ismail Abdel Majeed (2019), The impact of oil price fluctuations on monetary policy in Iraq, Ahl al-Bayt University, peace be upon them, Volume 16, Issue 25.
29. Al-Anbari, Maha Ahmed Hussein, (2016) Adapting the investment budget to changes in oil prices (an applied study in Iraq), Master's thesis, Middle East University, College of Business, Jordan.
30. Central Bank of Iraq, General Directorate of Statistics and Research, annual bulletins, for the period from 2004-2021, available at the electronic link: https://cbi.iq/news/view/492
31. Central Bank of Iraq, Statistical Website, Financial Sector, for the years 2004-2021, available on the website: https://cbiraq.org/SubCategoriesTable.aspx
32. International Atomic Energy Agency on the website: https://www.iaea.org
33. Khaleel, Zeyad Khalaf, (2021) IMPACT OF OIL PRICE FLUCTUATIONS ON IRAQ'S SUSTAINABLE DEVELOPMENT, Academy of Strategic Management Journal, Volume 20, Special Issue 6.
34. Khalil, Saed and Dombrecht, Michel, The Autoregressive Distributed Lag Approach to co/ integration testing: application to opt inflation, PMA Working Paper, 2011.