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By Universitas Muhammadiyah Sidoarjo

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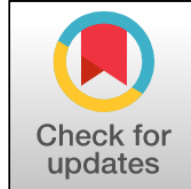
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Iraq's Oil Exports for 2023: Time Series Analysis

Ekspor Minyak Irak untuk tahun 2023: Analisis Deret Waktu

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Abstract

Crude oil is a vital energy source due to its high thermal energy output and lower cost compared to other energy sources. This study aimed to identify key variables influencing Iraq's oil revenues through a descriptive and analytical examination of Iraq's oil exports in 2023. Data showed monthly fluctuations in the average price and quantity of crude oil exported, with prices ranging from \$71.485 to \$91.353 per barrel, reflecting a 7.5% increase compared to the previous year. An inverse relationship was observed between oil prices and export volumes, where higher prices typically increased production and exports, while lower prices reduced them. The findings highlight Iraq's heavy reliance on oil exports, exposing its economy to risks from fluctuating oil prices, deteriorating infrastructure, environmental restrictions, and international regulations. The study concluded that diversifying the economy and addressing these challenges is crucial. It recommends improving infrastructure by modernizing ports, roads, railways, and oil facilities while enhancing security measures to support the oil sector and reduce vulnerabilities.

Highlights:

Crude oil drives Iraq's economy but risks dependency vulnerabilities.
Oil prices fluctuated in 2023, impacting production and export levels.
Modernize infrastructure and secure facilities to stabilize oil exports.

Keywords: Iraq, Oil Exports, Time Series Analysis

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Introduction

Crude oil is considered one of the most important sources of energy, due to its advantage of producing high thermal energy, firstly, and its low cost compared to other sources of energy, secondly. Therefore, various countries of the world have sought to obtain it by various means since the discovery of oil until the present time, as it is considered the lifeblood of the countries consuming and exporting it (1). Both, but it turns into a curse for countries that produce and export crude oil at times if its revenues are not managed in a way that achieves (balanced growth) (which is overcoming the inertia of a stagnant economy and pushing it towards higher levels of production and income in all economic sectors) (2). In addition to being the main source of income in many oil-producing countries, it is almost the only source of national income for some countries, such as Iraq, for example.

Crude oil prices in the global oil market are characterized by continuous fluctuations as a result of imbalances between oil supply and demand(3).

Oil revenues play an important and fundamental role in the economies of rentier countries because these countries depend on this source to provide foreign currency and finance the majority of the state's operating expenses(4,5). Therefore, these revenues affect all the economic variables of these countries. When the volume of revenues increases as a result of rising prices in the short term or increasing the volume of production in the long term, there is an increase in the level of economic activity in these countries because they are linked to a direct relationship, and the opposite is true in the case of a decline, and this phenomenon is called (the dependence of the economy on the oil sector)(6,7).

The Iraqi economy depends very heavily in its general revenues on crude oil exports, with the diminishing size of other revenue sources such as taxes, fees, etc., as oil revenues in Iraq face the problem of dependency on the oil sector, and it suffers from economic instability associated with fluctuations in oil prices (9,20). This dependency imposed difficulty on the Iraqi monetary and economic authorities in controlling offers and prices, and made it difficult to achieve sustainable development in the country (10,18). This is what is actually happening in the Iraqi economy, as the Iraqi economy, after producing and exporting oil, was transformed into a rentier economy that relies entirely on this sector to provide public revenues and contributes more than 56% to the gross domestic product, so the overall economy is suffering from instability and fluctuation. Simultaneous with oil revenues, which are subject to oil prices governed by external geopolitical factors. Oil is the main source of financing the Iraqi economy, as it constitutes more than 65% of the country's gross product and more than 98% of Iraq's exports. Therefore, oil plays a crucial role in determining the level of economic growth and the state budget in Iraq(11,12,13).

Iraq occupies a distinguished position among the oil countries in the world, whether in terms of its proven or reserve oil potential(14,19). It is ranked third in the world after the Kingdom of Saudi Arabia and Venezuela, as it possesses proven reserves of (143) billion barrels, and potential reserves of (350) billion barrels. This qualifies it to be the first oil producing and exporting country in the world in the coming years. Iraq's oil revenues increased after the year 2003, and the quantities increased as a result of the rise in global oil prices(15,16,17).

Methods

Description of the study

The time series analysis of Iraq's oil exports for the year 2023 aims to analyze the time series data for Iraq's oil exports during the current year and identify trends and changes in the volume of exports, prices, and the main destinations of exports.

As well as an analysis of the economic and political factors that affect Iraq's oil exports, such as global supply and demand for oil, geopolitical developments in the region, and OPEC's decisions regarding oil production.

study design

A descriptive and analytical cross-sectional study of Iraq's oil exports for the year 2023 was conducted.

Project preparation

The study was conducted in Iraq, specifically on Iraqi oil exports for the year 2023

The study sample

Data on Iraq's oil exports for the year 2023

Table No. (6) Quantity of Iraqi oil exported in 2023

12 Months

12 Months Number of barrels of oil exported per day - 2023 Exported crude oil price per day - 2023

Project tool

The following research tools can be used to study Iraqi oil exports in 2023:

1. Oil data management system
2. Economic and financial reports
3. Official data
4. Academic studies

Statistical data analysis

The data were analyzed using the Statistical Package for the Social Sciences (SPSS), version 26.

Descriptive data analysis

1. Percentage (%)
2. Arithmetic mean 27
3. Standard deviation.
4. Range
5. Coefficient variation (C.V) %
6. Skewness 28

Result and Discussion

Table 3 Results analysis of Iraq's oil exports according to Quarters of the year – 2023

Table No. (10): Descriptive Statistics for Iraq's oil exports according to Quarters of the year -2023								
Quantity (million) in 2023								
Quarters of the year	N	Range	Min	Max	Mean	Sd.	CV	Ass.
First quarter	3	8.99	92.26	101.24	98.13	5.09	5.18 %	Homo.
Second quarter	3	3.83	98.63	102.46	100.38	1.93	1.92 %	Homo.
Third quarter	3	3.61	103.14	106.75	105.33	1.92	1.82 %	Homo.
Four quarter	3	5.60	102.97	108.57	106.37	2.99	2.81 %	Homo.
Total	12							

Figure 1. Results Iraq's oil exports and Average price for crude oil in 2023

Table No. (7) provides data on Iraq's oil exports for the year 2023, showing the average price and quantity of crude oil exported each month. Usually, there is an inverse relationship between oil prices and the amount of exports, as high oil prices can lead to increased production and exports, while low oil prices can lead to a reduction in production and exports.

The table indicates that the average price of crude oil fluctuated throughout the year, ranging from 71,485 to 91,353 US dollars per barrel. This indicates an increase of %7.5 compared to the previous year.

Moreover, it can be noted that the quantities of Iraqi oil exported varied greatly, as the quantities exported varied from month to month, ranging between 92.255 million barrels in February and 108.57 million barrels in December. This volatility can be a result of changes in production and exports, as well as changes in demand for oil in global markets.

Overall, Table (7) provides a comprehensive overview of Iraq's oil exports in 2023, highlighting the fluctuations in both the average price and quantity of crude oil exported each month, as well as the statistical analysis of the export data.

In general, this table can be interpreted to mean that Iraqi oil exports witnessed fluctuations during 2023, indicating changes in the volume of exports during that period. This volatility can be a result of changes in the supply and demand of oil in global markets, as well as geopolitical and economic influences on the oil industry.

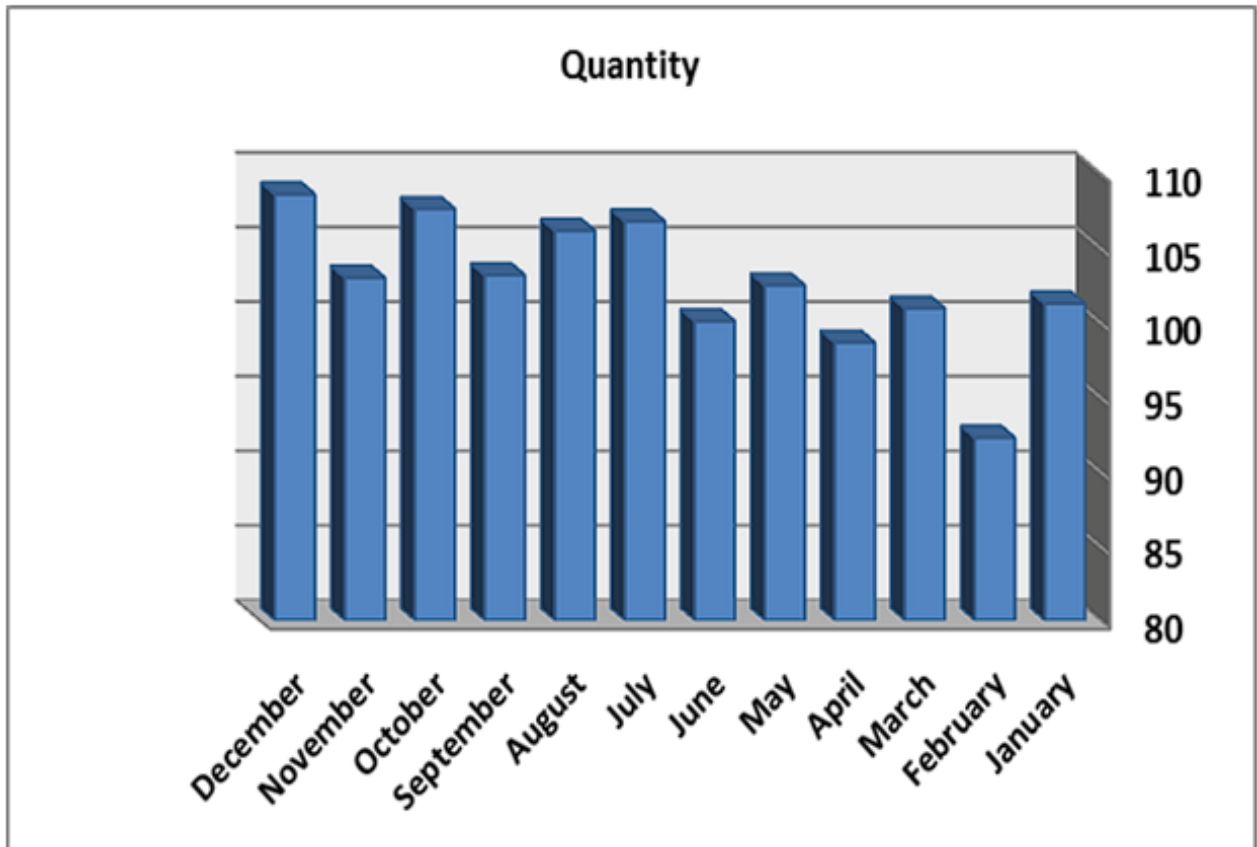


Figure 2. Iraq's oil exports for crude oil (Million Barrel per month) in 2023

Table No. (8): Descriptive Statistics for Iraq's oil exports in 2023								
Analysis of crude oil exports in 2023								
Barrel	N	Range	Min	Max	Mean	Sd.	CV	Ass.
Quantity (million)	12	16.31	92.25	108.57	102.55	4.51	4.39 %	Hom o.

Figure 3. Results Analysis of crude oil exports in 2023

CV = coefficient variation, if CV < 30 % is homogeneous, as for cv > 30 % is heterogeneous

Table No. (8): presents descriptive statistics for Iraqi oil exports in 2023, showing important details about the volume of exports and their fluctuations during the year. The table shows the full range of export quantities from a minimum value of 92.25 million barrels to a maximum value of 108.57 million barrels, as well as the mean and standard deviation that reflect the degree of dispersion of the data around the mean.

The coefficient of variation was used to evaluate the homogeneity or heterogeneity of the data. Thus, the coefficient of variation shows that the data is homogeneous at 4.39%, which indicates that the distribution of export quantities was homogeneous during the year.

These descriptive statistics help understand the distribution of Iraqi oil exports during 2023 and evaluate the extent of fluctuations in the volume of exports.

Table No. (9) Iraq's oil exports according to months of the year – 3023	
2023	Quantity (Barrel)
Month	Million
January	101.245
February	92.255
March	100.913
April	98.634
May	102.463
June	100.059
July	106.755
August	106.122
September	103.143
October	107.592
November	102.975
December	108.570

Figure 4. Iraq's oil exports according to months of the year – 3023

Table No. (9): Shows the quantities of Iraqi oil exports during 2023 by month. It is clear from the table that export quantities ranged from 92.255 million barrels in February to 108.570 million barrels in December. The table also shows fluctuations in the volume of exports during the year, as exported quantities vary from month to month.

These data help understand the monthly dynamics of Iraqi oil exports during 2023 and highlight fluctuations in the volume of exports during the mentioned period.

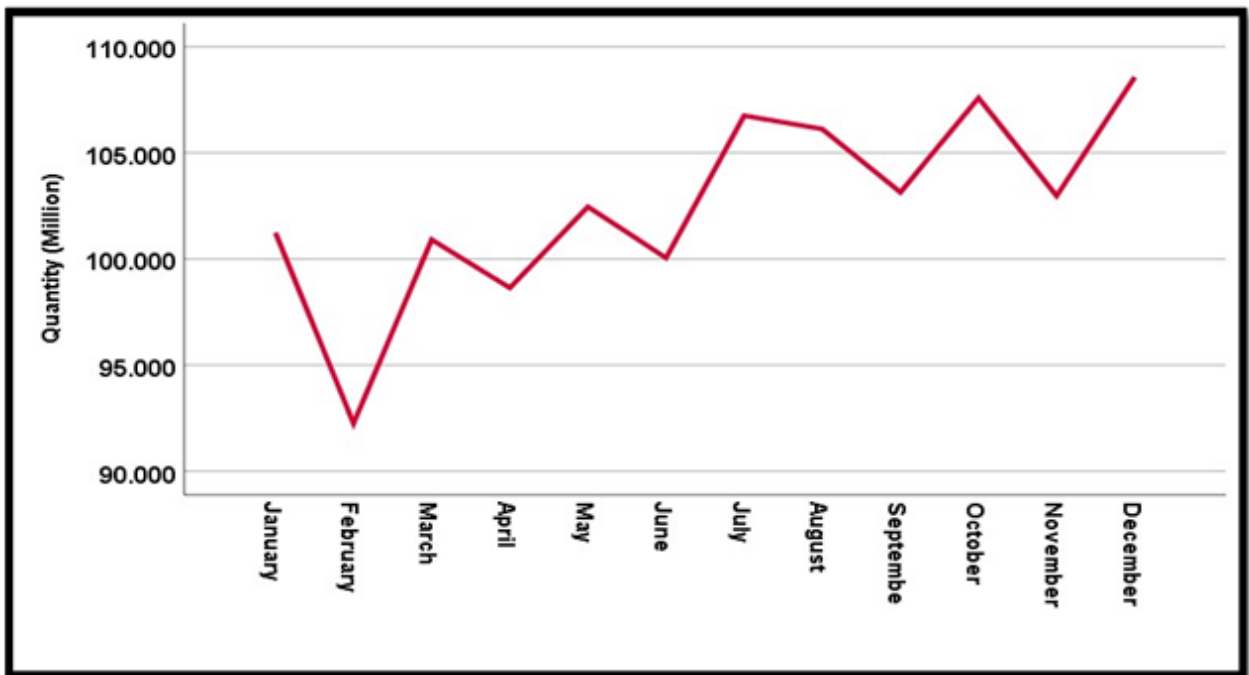


Figure 5. Iraq's oil exports time series for crude oil per month in 2023

Table 3 Results analysis of Iraq's oil exports according to Quarters of the year – 2023								
Table No. (10): Descriptive Statistics for Iraq's oil exports according to Quarters of the year -2023								
Quantity (million) in 2023								
Quarters of the year	N	Range	Min	Max	Mean	Sd.	CV	Ass.
First quarter	3	8.99	92.26	101.24	98.13	5.09	5.18 %	Homo.
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Third quarter	3	3.61	103.14	106.75	105.33	1.92	1.82 %	Homo.
Four quarter	3	5.60	102.97	108.57	106.37	2.99	2.81 %	Homo.
Total	12							

Figure 6. Results analysis of Iraq's oil exports according to Quarters of the year - 2023

Table No. (10) provides an analysis of Iraqi oil exports according to the four quarters of 2023.

An analysis of Iraq's oil exports by quarters of 2023, as shown in the table above, indicates relatively stable quantities of oil exports during the four quarters. The coefficient of variation (cv) for each quarter is also low, ranging from 1.82% to 5.18%, indicating a relatively stable level of exports during each quarter. This stability provides insight into oil export volumes across the four quarters into the steady performance of Iraq's oil industry throughout 2023. The data presented in this table can be interpreted as follows:

First quarter: Data indicate that the amount of Iraqi oil exports amounted to 98.13 million barrels during the first quarter of 2023, with a variation in the standard deviation (sd) of 5.09 million barrels. This figure can be interpreted as the average amount of exports during this quarter with a certain variation between the values.

Second quarter: Data indicate an increase in the amount of Iraqi oil exports to 100.38 million barrels during the second quarter of 2023, with a variation in the standard deviation (sd) of 1.93 million barrels. This rise can be interpreted as a rise in the quantity of exports with a reduction in the variance between values.

Third quarter: Data indicate a continuous increase in the quantity of Iraqi oil exports to 105.33 million barrels during the third quarter of 2023, with a variation in the standard deviation (sd) of 1.92 million barrels. This increase can be interpreted as a continuation of the increase in the quantity of exports with a stabilization in the variance between values.

Fourth quarter: Data indicate a continued increase in the quantity of Iraqi oil exports to 106.37 million barrels during the fourth quarter of 2023, with a variation in the standard deviation (sd) of 2.99 million barrels. This rise can be interpreted as a continuation of the increase in the quantity of exports with a slight increase in the variance between the values.

In general, this table can be interpreted to mean that Iraqi oil exports have witnessed a continuous increase during

the four quarters of 2023, which indicates an improvement in the volume of exports during that period.

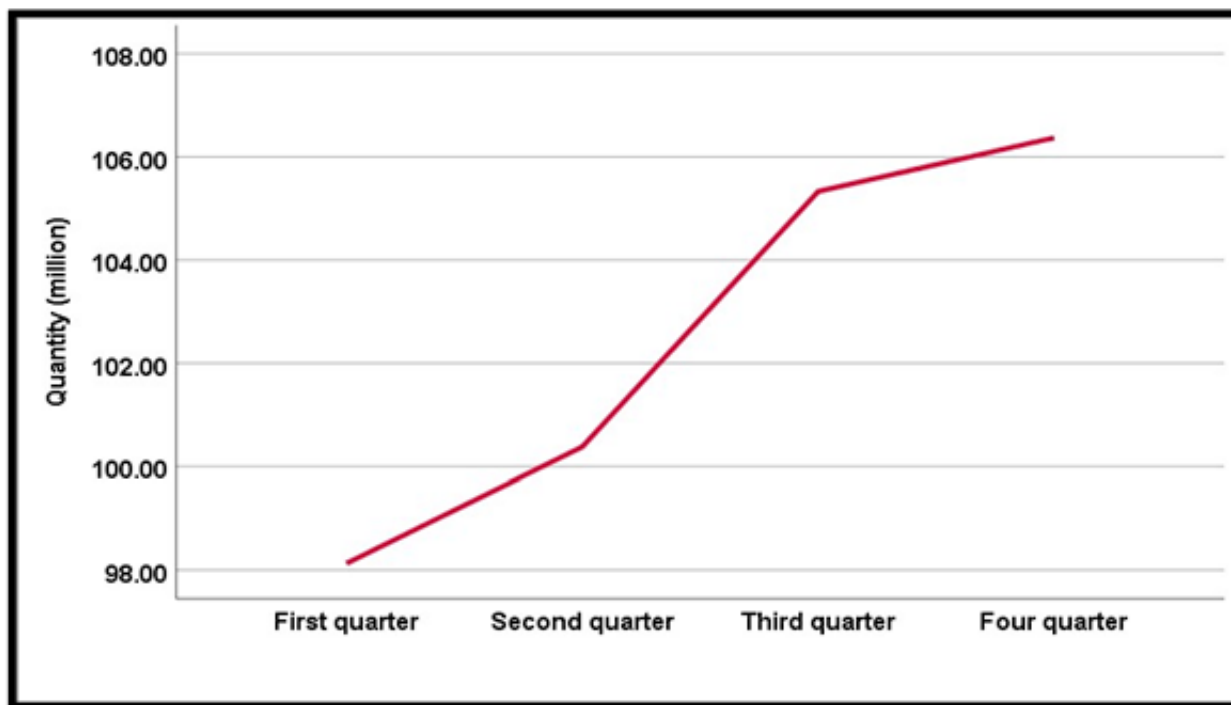


Figure 7. Iraq's oil exports time series for crude oil per quarter of 2023

Conclusion

1. The focus of Iraq's export structure on the oil sector makes the Iraqi economy vulnerable to fluctuations affecting the oil sector, and makes it vulnerable to risks associated with excessive reliance on oil as a main source of income.
2. There are several factors negatively affecting Iraqi oil exports, such as deteriorating infrastructure, low global oil prices, environmental restrictions and international legislation, which calls for action to improve the situation.
3. Iraq possesses enormous oil wealth that places it at the forefront of countries in the world in terms of proven and potential oil reserves, making it a major source of national income.

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