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Using the SVAR model for measuring the impact of oil prices on the inflation rate in Iraq for the period (2004 - 2021)

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Abstract. The objective of the study is to examine the correlation between oil prices and inflation and to assess the influence of oil prices on the inflation rate in Iraq from 2004 to 2021. The research utilized the SVAR model to determine a clear correlation between oil prices and inflation in Iraq. Additionally, it was found that a specific percentage increase in oil prices would result in a corresponding rise in the inflation rate by 763% of that percentage. Furthermore, when a structural shock in oil prices occurs in the global market, equivalent to one standard deviation, it will lead to a 0.08% increase in the inflation rate even after two and a half years. The research suggests that to mitigate the impact of shocks and maintain stability, Iraq should utilize its financial surpluses by investing in sectors where it has a strong comparative advantage. This can generate additional income for the country, apart from oil revenues, and help the Iraqi economy avoid inflation when global oil prices are high, thus reducing the impact of imported global inflation.

Keywords: oil price, inflation, SVAR, Iraq.

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استخدام نموذج SVAR لقياس تأثير أسعار النفط على معدل التضخم في العراق للمدة (2004-2021)

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المستخلص. يهدف البحث إلى تحليل العلاقة بين أسعار النفط الخام والتضخم، فضلاً عن تقدير تأثير أسعار النفط الخام على معدل التضخم في العراق للمدة (2003 – 2021) باستعمال نموذج SVAR، وتوصل البحث الى وجود علاقة عكسية بين أسعار النفط الخام والتضخم في العراق، فضلاً عن ذلك إن زيادة اسعار النفط الخام بنسبةٍ (1%) ستؤدي لانخفاض التضخم في العراق بنسبة(0.12%)؛ نتيجة لاعتماد الحكومة على إيرادات النفط الخام كقوة شرائية حقيقية في الاقتصاد والتي تعمل على تخفيض معدل التضخم الناجم عن السياسة النقدية المحفزة أوقات انخفاض أسعار النفط الخام في السوق الدولية، ويوصي البحث بضرورة اتباع سياسة نقدية محايدة تجنباً للضغوط السياسية والناجمة أوقات الازمات النفطية الإيجابية منها والسلبية.

الكلمات المفتاحية: أسعار النفط، التضخم، SVAR، العراق.

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Introduction:

Oil is a crucial economic resource in today's world. Still, its prices in the global market are volatile, significantly impacting the economies of all countries, particularly those that heavily rely on oil as a critical sector.

The Iraqi economy is among the largest economies dependent on oil revenues as a primary source of foreign currency, from which its currency (the Iraqi dinar) derives its strength, especially since the oil sector dominates more than (%95) of Iraqi exports and therefore increasing oil prices leads to increase oil revenues. Thus, foreign currency, which will increase the exchange rate of the Iraqi dinar, so that Iraqi non-oil exports will be sold at a higher value than their actual value, which will lead to a decline in non-oil exports; this happened as a result of the inflation of the value of the Iraqi dinar due to the foreign currency (the US dollar) resulting from oil revenues.

Research problem : The research challenge revolves around the following inquiry:

- Do oil prices affect Iraq's inflation rate?

Research Hypothesis: The research is based on the following two hypotheses: -

Null Hypothesis: There is no direct relationship between oil prices and the inflation rate in Iraq.

Alternative Hypothesis: There is a direct relationship between oil prices and the inflation rate in Iraq.

Research objectives : The research aims to achieve the following objectives :

1. Analyze the relationship between oil prices and the inflation rate.
2. Measuring and analyzing the relationship between oil prices and the inflation rate in Iraq for the period (2004 - 2021).
3. The impact of historical structural shocks in oil prices on the inflation rate in Iraq for the period (2004 - 2021).
4. The extent to which a structural shock in oil prices affects the inflation rate in Iraq.

Research methodology: The study employs a deductive methodology to measure and analyze the correlation between oil prices and the inflation rate in Iraq from 2004 to 2021. Advanced economic measurement techniques, specifically SVAR (Structural Vector Autoregression), are used with the Eviews12 software program.

The first axis
The theoretical framework of oil price and inflation

First : Oil price :

Oil prices exhibit volatility and instability due to various factors associated with the prevailing uncertainty in global markets. Additionally, these markets are susceptible to global economic conditions, and events and developments since the 1960s have significantly influenced the trajectory of oil prices worldwide.

Since reducing the control of monopolistic oil companies and the control of oil states and their national companies over its production, through the establishment of the Organization of Petroleum Exporting Countries (OPEC), which has a fundamental and effective role in determining oil prices in global markets, this is in addition to the great economic development witnessed by some countries with emerging economies, such as China, India, and Brazil, and their demand for oil has increased significantly, in addition to developments in the search for alternative sources of energy, all of these factors and others combined have led to a rise in the global price of oil.(Ali ,2011: 188)

The price of oil can be defined as the value of the oil commodity expressed in a monetary unit at a known time and place. (Al-Hiti, 2006 : 73)

In other words, the oil price refers to the monetary value of a barrel of crude oil on the international market, estimated in US dollars. (Hou & Keane, 2015: 10-11)

The relationship between the price of oil and its value is not fixed, but rather it is often an unequal relationship, the price of a barrel of oil in many periods of time was less than its true value, this disparity between the price of oil and its value is due to several factors, including natural, political, and others related to the costs of extraction and others. (Al-Douri,1988: 262)

Oil prices in global markets, like the rest of the prices of other goods and services, depend on the interaction of the forces of supply and demand as they are the main determinants of the price of oil and not only the changes that occur in the price of the US dollar. Economic and population growth rates as well as income levels can be considered factors determining the demand for oil, the size of the supply is affected by the levels of surplus production capacity in OPEC countries and the size of the expansion of production capacities, in addition to economic crises and natural disasters. (Bouirieh, 2017: 16)

Second : Inflation :

Inflation is one of the macroeconomic phenomena of the national economy, and most economists agree that inflation is a monetary phenomenon that most of the world's economies, especially developing countries, suffer from, but to a varying extent, the importance of this economic problem appears as a result of its negative economic and social effects on the economy and society as a whole.

Although the pioneers of monetary theory and Keynesian theory agreed that inflation is a monetary phenomenon, and despite it being one of the most common economic concepts, there was no agreement on a specific definition for it, rather, several definitions appeared for it, including those that were based on the phenomenon of rising prices as a criterion, so inflation was defined as the amount of the relative change that occurs in the prices of goods and services over time. (Basu & Kaushik, 2011: 5)

Inflation is also defined as an upward movement of prices characterized by self-perpetuation resulting from excess demand in excess of the amount of excess supply. (Abaya, 2004: 91)

There is another economic concept that sees inflation as a continuous increase in the general level of prices linked to the increase in the size of the money supply and the decline in the value of money. (Oner & Ceyda, 2010: 6)

Based on the above, it can be said that inflation is every increase in the circulating money supply that results in an increase in the volume of aggregate demand.

Third: The relationship between oil prices and inflation (Dutch disease):

The Dutch disease is the development of a specific sector (natural resources) with the underdevelopment of other sectors (industry and agriculture), the exchange rate of the local currency increases due to the influx of foreign currency, which increases the price of exports and reduces the price of imports, which leads to the underdevelopment of other sectors, this term was formulated for the first time in 1977 by The Economist to describe the phenomenon of decline in the manufacturing sector in the Netherlands after the discovery of the Groningen natural gas field. (Zaghir, 2020: 39)

Some economists have developed an economic model that describes the Dutch disease, where there are two sectors, one of which is prosperous (the sector of extracting natural resources, such as oil, gas, or some precious metals) and the other is not prosperous (a backward sector, such as industry or agriculture). The prosperous sector affects the economy through the influence of the movement of resources, as the increase in demand for work in the extractive sector leads to shifting production towards this sector and away from other sectors, which leads to its undermining and backwardness, in addition to the impact of spending, as the boom in natural resource prices results in additional revenues, which leads to an increase in the real exchange rate, so imports become cheaper than exports. Which means lag behind other sectors.

The second axis

Estimating the impact of oil prices on the inflation rate in Iraq for the period (2004 - 2021)

First : methodology

The research deals with the relationship between oil prices (OILP) and the inflation rate (INF), and the general formula of the model was determined according to the following:

$$X_T = (OILP_T, INF_T) \dots\dots\dots (1)$$

$$X_T = A_1 X_{T-I} + A_2 X_{T-I} + A_P X_{T-P} + \epsilon_T \dots\dots\dots (2)$$

Since:

X_T: The research variables are oil prices (OILP) and inflation rate (INF).

A: The instantaneous parameter matrix of the reduced form of the VAR model.

ϵ_T: remainders.

P: number of time lags.

Based on economic theory, the connection between oil prices and the inflation rate is unidirectional. Specifically, oil prices impact the inflation rate but not vice versa. Consequently, some limitations have been imposed on the A and B matrices.

$$A = \begin{vmatrix} 1 & a_{12} \\ 0 & 1 \end{vmatrix} \qquad B = \begin{vmatrix} a_{11} & 0 \\ 0 & a_{22} \end{vmatrix}$$

From the above matrices, it is clear that the current period's inflation rate is affected by both the previous period's inflation rate and crude oil prices. Nevertheless, the prevailing oil prices in the current era are only influenced by the prices observed in the previous period rather than the inflation rate. By taking into account these economic limitations, we can express the equations of the SVAR model in the following manner:

$$INF_T = a_{1\,1}\, INF_{T-I} + a_{1\,2}\, OILP_{T-I} + a_{1\,N}\, INF_{T-P} + a_{1\,N}\, OILP_{T-P} + \epsilon_{QT} \dots\dots\dots (3)$$

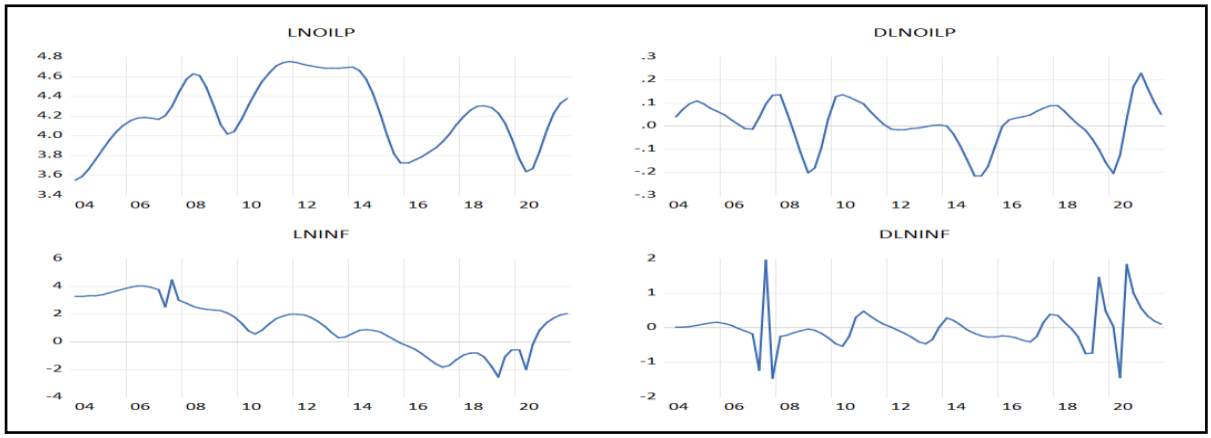
$$OILP_T = a_{2\,2}\, OILP_{T-I} + a_{1\,N}\, OILP_{T-P} + \epsilon_{ZT} \dots\dots\dots (4)$$

Equation (3) allows us to simulate the transmission of structural shocks in the residuals from the previous period's oil prices (OILP T-1) and inflation rate (INF T-1) to the current period's inflation rate (INF T) using the impulse response function.

Second: data :

The data used in this analysis includes Brent oil prices (LnOILP) and the inflation rate for Iraq (LnINF). The Brent oil prices were obtained from the British Petroleum Company (BP), while the inflation rate data was sourced from the Iraqi Ministry of Planning. Both datasets were converted from annual to quarterly data from 2004.Q1 to 2021.Q4 using the Litterman method and transformed into natural logarithm form. The analysis is based on 72 observations, and the graph (1) displays the data for the SVAR model.

Figure (1): oil prices (LnOILP) and Iraq's inflation rate (LnINF) for the period (2004.Q1-2021.Q4)



Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Third: Unit Root Tests :

There are several tests to detect whether a time series is stationary or not. The most famous of these are the Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. The stationary time series means that its mean, variance, and variation are constant over time. Thus, the time series is stationary when the three aforementioned conditions are met, in order to avoid the phenomenon of false regression.

The table below demonstrates that the two-time series for oil prices (LnOILP) and the inflation rate (LnINF) are stationary at the first difference [I(1)]. This is indicated by the statistical value (T) for both tests (ADF, PP) being more significant than the tabular basis and the value of (P – Value) being less than 5%. Therefore, we reject the null hypothesis that the two-time series is not stationary and accept the alternative hypothesis that the two-time series are stationary at the first difference [I(0)].

Table (1): Test (ADF, PP) for the SVAR standard model

Unit root tests:								
At Level*					**At the first difference**			
The tests	**ADF**		**PP**		**ADF**		**PP**	
	T-Statistic	**Prob**	**T-Statistic**	**Prob**	**T-Statistic**	**Prob**	**T-Statistic**	**Prob**
LnOILP	**-2.302**	**0.176**	**-2.502**	**0.119**	**-3.490**	**0.011**	**-3.125**	**0.029**
LnINF	**-1.505**	**0.525**	**-1.483**	**0.536**	**-8.950**	**0.000**	**-8.945**	**0.000**

Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Fourth: Determining the optimal deceleration of the model:

One of the conditions for the SVAR model is to determine the optimal number of decelerations, and statistical standards are used, such as the Akaike standard, in addition to other standards.

From Table 2 below, it is noted that the optimal number of decelerations is six time decelerations for most statistical standards, as the statistical value of the standards is the lowest when compared with the results of six time lags.

Table (2): Choosing the optimal slowdown period according to statistical criteria

VAR Lag Order Selection Criteria
Endogenous variables: D(LNINF) D(LNOILP)
Exogenous variables: C
Date: 04/24/23 Time: 16:12
Sample: 2004Q1 2021Q4
Included observations: 65

Lag	LogL	LR	FPE	AIC	SC	HQ
0	2.602498	NA	0.003365	-0.018538	0.048366	0.007860
1	46.81550	84.34480	0.000977	-1.255862	-1.055149	-1.176667
2	90.23488	80.15885	0.000290	-2.468765	-2.134244	-2.336775
3	100.0837	17.57637	0.000243	-2.648729	-2.180400*	-2.463943*
4	105.0718	8.594888	0.000236	-2.679133	-2.076995	-2.441551
5	106.2958	2.033703	0.000258	-2.593717	-1.857770	-2.303339
6	115.3935	14.55638*	0.000221*	-2.750570*	-1.880815	-2.407396

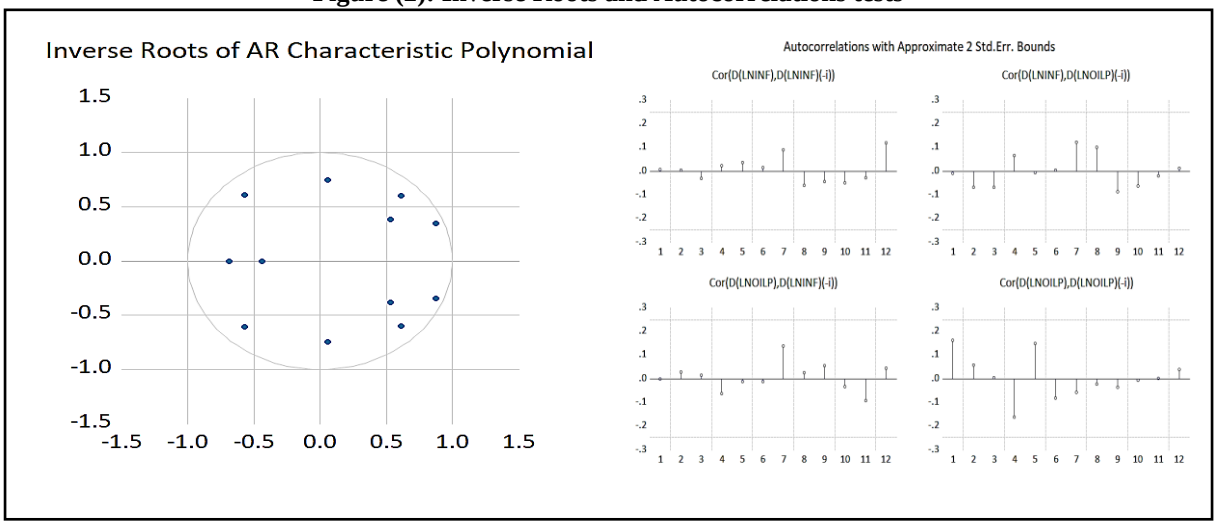
* indicates lag order selected by the criterion
LR: sequential modified LR test statistic (each test at 5% level)
FPE: Final prediction error
AIC: Akaike information criterion
SC: Schwarz information criterion
HQ: Hannan-Quinn information criterion

Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Fifth: Tests of the quality of SVAR model estimation.

Figure (2) below displays the results of the inverse roots and autocorrelation tests for the quality of the SVAR model estimate. The analysis reveals that the parameters of the estimated SVAR model are stable, as all the roots are located within the unit circle. This satisfies the stability condition of the model. Additionally, the test confirms that the remainder of the model has no serial link problem. The test result falls within the confidence limits at a significance level of 5%, which leads to accepting the null hypothesis and rejecting the alternative hypothesis that there is no autocorrelation problem in the remainder of the estimated SVAR model.

Figure (2): Inverse Roots and Autocorrelations tests



Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Table (3) indicates that the (Jarque – Bera) and (White) tests assess the accuracy of model estimation. The results of the (Jarque – Bera) test confirm that the residual of the SVAR model follows a normal distribution, with a P-value of 0.2821. This implies accepting the null hypothesis and rejecting the alternative hypothesis. Additionally, table (3) demonstrates that the model does not suffer from variance differences, as the (P-value) for (Chi-sq) is equal to 7.55%, which is greater than 5%. Therefore, the null hypothesis is accepted, and the alternative hypothesis is rejected.

Table (3): Jarque – Bera and (White) tests

Component	Jarque-Bera	df	Prob.
1	4.152280	2	0.1254
2	0.899177	2	0.6379
Joint	5.051457	4	0.2821

VAR Residual Heteroskedasticity Tests (Levels and Squares)
Date: 04/24/23 Time: 18:36
Sample: 2004Q1 2021Q4
Included observations: 65

Joint test:

Chi-sq	df	Prob.
89.87340	72	0.0755

Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Sixth: Estimating the SVAR model and interpreting the results:

The model estimation results in Table (4) indicate that all variables are statistically significant. This is evident from the T statistic values, which are greater than the tabular value, and the P-values, which are less than 5%. Therefore, we can reject the null hypothesis and accept the alternative hypothesis. Specifically, when there is a 1% increase in oil prices in the previous semester (C(1) or OILPt-1), it leads to a 7.63% increase in the inflation rate in the current semester (INFt), assuming that all other factors influencing the model remain constant. Conversely, a decline in oil prices would have the opposite effect. Furthermore, if the inflation rate in the previous semester (C(2) or INFt-1) increases by 1%, it will result in a 0.56% increase in the inflation rate in the current semester (INFt), assuming that all other factors affecting the model remain constant.

It is also noted from the results of the SVAR model that there is a direct relationship between oil prices and the inflation rate in Iraq, as increasing oil prices by a certain percentage will lead to an increase in the inflation rate by (%763) of that percentage, due to the rentierism of the Iraqi economy, which depends on oil revenues (crude oil rents) to finance the general budget by about (%95) for the period (2003 - 2021), in addition to that, the oil and mining sector constitutes about (%60) of Iraq's gross domestic product for most years of the period, thus, when any increase in oil prices occurs, it will be reflected in the form of an increase in government spending due to the government adopting ambitious development plans in addition to increasing public employment, this leads to an increase in the purchasing power of individuals and due to the decrease in the contribution of the rest of the economic sectors to the gross domestic product, thus creating Competition for services, which cannot be compensated for by numerous commodity imports, which creates inflationary pressures in the Iraqi economy.

Table (4): SVAR model estimation results

Structural VAR Estimates
Date: 04/24/23 Time: 18:45
Sample (adjusted): 2005Q4 2021Q4
Included observations: 65 after adjustments
Estimation method: Maximum likelihood via Newton-Raphson (analytic derivatives)
Convergence achieved after 20 iterations
Structural VAR is just-identified

Model: Ae = Bu where E[uu']=I

A =

1	C(1)
0	1

B =

C(2)	0
0	C(3)

	Coefficient	Std. Error	z-Statistic	Prob.
C(1)	7.625122	3.102869	2.457442	0.0140
C(2)	0.556967	0.048849	11.40175	0.0000
C(3)	0.022264	0.001953	11.40176	0.0000

Log likelihood 100.8892

Estimated A matrix:

1.000000	7.625122
0.000000	1.000000

Estimated B matrix:

0.556967	0.000000
0.000000	0.022264

Estimated S matrix:

0.556967	-0.169768
0.000000	0.022264

Estimated F matrix:

0.501227	0.020234
-0.001417	0.097338

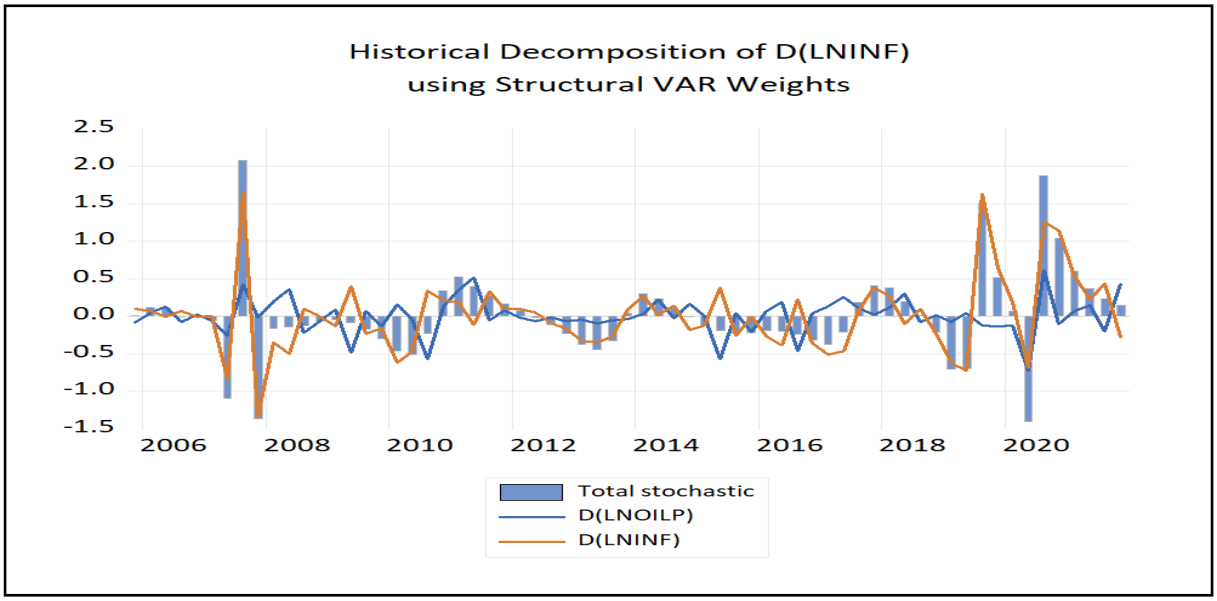
Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

The three axis
The impact of structural shocks on the inflation rate

First: Historical Decomposition of the structural shocks to the inflation rate in Iraq:

The technique of Historical Decomposition was employed to analyze past structural shocks that affected the inflation rate of Iraq from 2003 to 2021. Figure (3) below illustrates the direct impact of structural shocks in oil prices on Iraq's inflation rate. From 2003 to 2007, there was a significant increase in inflation rates, coinciding with a rise in crude oil prices. However, the global financial crisis of 2008 and the subsequent decline in crude oil prices, which persisted until late 2010, resulted in a relatively moderate inflation rate for Iraq. This was due to the decrease in oil prices and the implementation of the Tyler Rule by the Central Bank of Iraq to address the long-standing issue of inflation in the Iraqi economy since 1980. Conversely, when oil prices exceeded $100 per barrel, the Iraqi government substantially increased its spending, leading to an inflation rate surge in 2011, 2012, and 2013. Due to the reduction in oil prices from 2014 to 2021, Iraq implemented an austerity financial policy, resulting in a substantial decline in the inflation rate.

Figure (3): Structural shocks to the inflation rate in Iraq for the period (2003 - 2021)

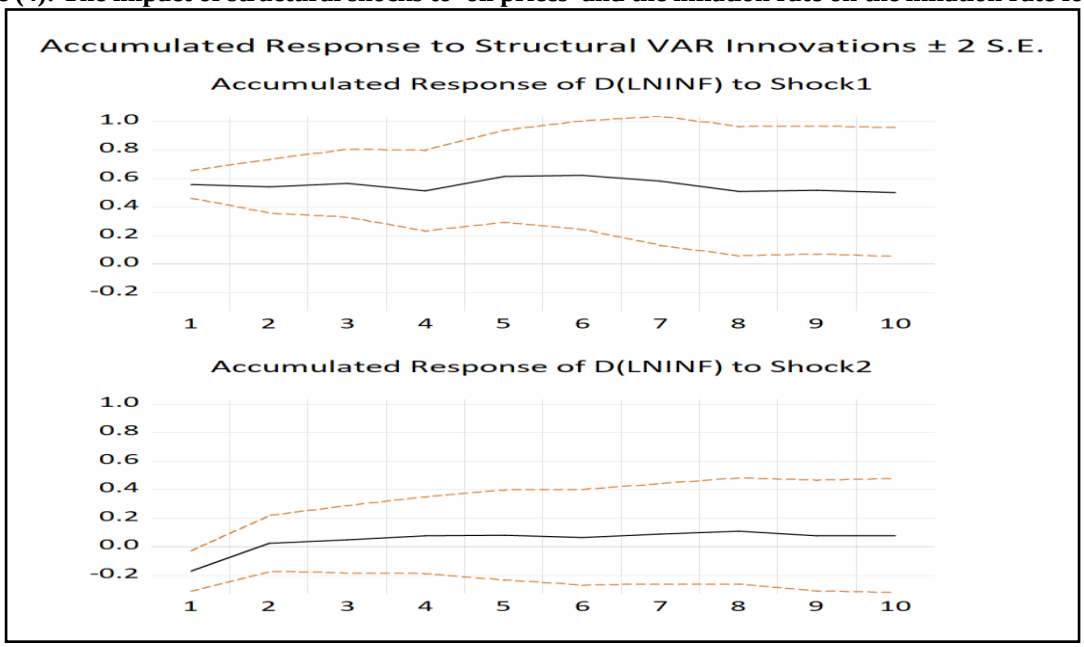


Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Second: Analysis of structural shocks to private consumer spending in Iraq:

The Impulse Response Function is a crucial tool for the SVAR model in assessing the magnitude of the influence of structural shocks on the independent variables and their transmission to the dependent variable. Figure 4 and Table 5 illustrate the impact of structural shocks in oil prices on the inflation rate. Furthermore, in the event of a structural shock causing the inflation rate to deviate by one standard deviation, there will be a corresponding increase of 0.56% in the inflation rate during the first semester unless... The inflation rate is projected to decline to 0.54% in the second semester, then climb again to 0.57% in the third trimester. The highest increase will occur in the sixth semester, reaching 0.62%. However, by the seventh semester, the inflation rate will reduce to 0.58% and continue to decline until it reaches 0.5% in the tenth semester, two and a half years later. This decrease will occur without the inflation rate returning to its previous level before the shock.

Figure (4): The impact of structural shocks to oil prices and the inflation rate on the inflation rate for Iraq



Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

A one-standard-deviation structural shock in oil prices will initially cause a decrease in the inflation rate of -0.17% in the first semester. However, this decrease will quickly reverse into an increase of 0.02% in the second semester. The increase in the inflation rate continues in the subsequent semesters, reaching its peak of 0.1% in the eighth semester. The

inflation rate then experiences a decrease of 0.08% in the ninth and tenth semesters. Consequently, the inflation rate ultimately increases by 0.08% due to the structural shock in oil prices in the global market, even after two and a half years since the shock, without returning to the pre-shock equilibrium.

Table (5): Structural shocks to oil prices and the inflation rate in the inflation rate of Iraq

Period	Shock1	Shock2
1	0.556967	-0.169768
	(0.04885)	(0.07067)
2	0.543645	0.023514
	(0.09317)	(0.09797)
3	0.566467	0.049929
	(0.11932)	(0.11849)
4	0.512289	0.077591
	(0.14141)	(0.13445)
5	0.615211	0.079952
	(0.16195)	(0.15751)
6	0.622201	0.066825
	(0.19003)	(0.16764)
7	0.580451	0.090638
	(0.22615)	(0.17611)
8	0.510144	0.109778
	(0.22661)	(0.18536)
9	0.517519	0.077776
	(0.22500)	(0.19379)
10	0.502274	0.076951
	(0.22491)	(0.20085)
Factorization: Structural Standard Errors: Analytic		

Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Third: Analysis of the variance of structural shocks to private consumer spending in Iraq:

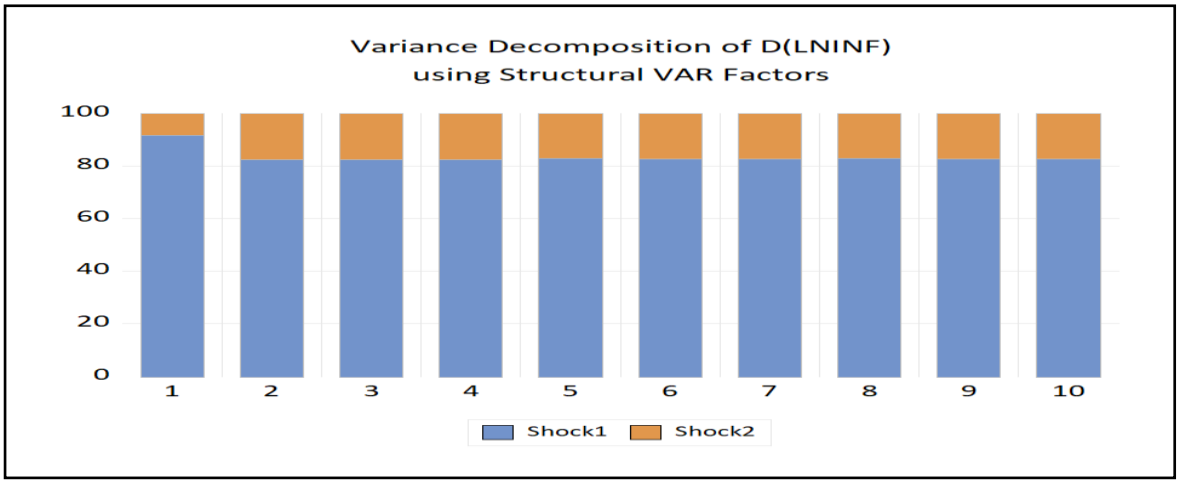
Variance Decomposition examines the relative influence of structural shocks in the independent variables on the dependent variable. Table (6) and figure (5) demonstrate that structural shocks to the inflation rate significantly impact it. In the first semester, these shocks contribute approximately 91% to the inflation rate, but this percentage decreases to 82% in the second semester and remains consistent for ten semesters. On the other hand, structural shocks in oil prices contribute around 9% to the inflation rate shocks in the first semester. Still, this percentage decreases to 7% in the second semester and remains consistent for ten semesters after the shock.

Table 6: Analysis of variance for structural shocks for the SVAR model

Period	S.E.	Shock1	Shock2
1	0.582266	91.49901	8.500993
2	0.613652	82.42575	17.57425
3	0.614644	82.29774	17.70226
4	0.617647	82.26888	17.73112
5	0.626168	82.74675	17.25325
6	0.626345	82.71255	17.28745
7	0.628186	82.67006	17.32994
8	0.632398	82.80853	17.19147
9	0.633250	82.59937	17.40063
10	0.633434	82.60931	17.39069
Factorization: Structural			

Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Figure (5): Analysis of variance of structural shocks



Source: Derived from the researcher's analysis using the statistical software tool Eviews12.

Conclusions:

1- he alternative research hypothesis was proven that there is a direct relationship between oil prices and the inflation rate in Iraq.

2- Increasing crude oil prices by a certain percentage will lead to an increase in the inflation rate by (7.63%) of that percentage; due to the rentier nature of the Iraqi economy, which depends on oil revenues (crude oil rents) to finance the general budget by about (95%) for the period (2003-2021), in addition to that the oil and mining sector constitutes about (60%) of Iraq's gross domestic product for most years of the period under study, and therefore when any increase in crude oil prices occurs, it will be reflected in the form of an increase in government spending due to the government adopting ambitious development plans in addition to increasing public employment, and this leads to an increase in the purchasing power of individuals and due to the low contribution of the rest of the economic sectors to the gross domestic product, thus creating competition for services that cannot be compensated for by the many commodity imports, which constitutes inflationary pressures in the Iraqi economy

3- When a structural shock occurs in crude oil prices by one standard deviation, it will lead to a decrease in the inflation rate in the first quarter by (% -0.17), but this decrease will quickly turn into an increase in the second quarter by (0.02%), and this percentage continues to increase in the following quarters to reach its peak in the eighth quarter by (0.1%), and the inflation rate achieves a decrease in the inflation rate in the ninth and tenth quarters at (0.08%), and thus the inflation rate achieves an increase by (0.08%) as a result of a structural shock in crude oil prices in the international market even after two and a half years have passed since the shock without returning to the pre-shock equilibrium.

4- Structural shocks to the inflation rate have the greatest impact on it, as they contribute in the first quarter by about (91%), but this percentage will quickly decrease in the second quarter to (82%), which continues even after ten quarters, while structural shocks to crude oil prices contribute about (9%) of the inflation rate shocks in the first quarter, but this percentage will decrease in the second quarter to (7%), which continues even after ten quarters have passed since the shock occurred.

Recommendations:

1 -Using cointegration models to know the long-term effect and to know the extent of the impact of shocks in the independent variable on the dependent variable.

2 -Using Monte Carlo simulation to develop a set of scenarios for what the global oil market may be exposed to shocks and their consequences on inflation in Iraq to develop precautionary plans by the relevant institutions.

3 -Working on exploiting financial surpluses to invest them in the various productive sectors in which Iraq has a high comparative advantage, which may create additional rent for the country other than oil rent and avoid the Iraqi economy inflation during times of high global crude oil prices, which reduces the impact of global inflation imported into the country.

References

1- Abaya, G. H. (2004). Financial inflation in Egypt. University Youth Foundation.
2- Al-Douri, M. A. (1988). Principles of Oil Economics. Al-Irshad Press, Baghdad.
3- Al-Hiti, A. H. (2006). Oil Economics. Dar Al-Kitab Publishing and Printing, Mosul.
4- Ali, A. A. (2011). Oil Economics and Oil Investment in Iraq. House of Wisdom, Baghdad.
5- Basu, K. (2011). Understanding inflation and controlling. Ministry of Finance of India.

6- Bouiriyah, I. (2017). Dollar fluctuations and the future of oil and petrodollar prices. Center for Arab Unity Studies, 40(461).
7- Hou, Z., & Keane, J. (2015, March). The Oil Prices Shock Of 2014 Drivers, Impacts, and policy Implications (Working paper number 415). Overseas Development Institute, UK.
8- Oner, C. (2010). What is inflation. Finance & Development, 47(1), 44.
9- Zaghir, A. N. (2020). The impact of crude oil price fluctuations on the financial policy options of selected countries for the period (1990 - 2017), with special reference to Iraq (Unpublished doctoral thesis). College of Administration and Economics - Al-Mustansiriya University, Baghdad

Appendix 1: Oil price and inflation data in Iraq for the period (2004 - 2021)

t	oilp	inf
2004	38.265	**26.8**
2005	54.52109	**37.1**
2006	65.14406	**53.1**
2007	72.38908	**30.8**
2008	97.25597	**12.7**
2009	61.67126	**8.3**
2010	79.49553	**2.5**
2011	111.2556	**5.6**
2012	111.6697	**6.1**
2013	108.6585	**1.9**
2014	98.94601	**2.2**
2015	52.38676	**1.4**
2016	43.73417	**0.5**
2017	54.19244	**0.2**
2018	71.31006	**0.4**
2019	64.21057	**-0.2**
2020	41.83835	**0.6**
2021	70.9119	**6**