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Measuring the impact of external exchange rate shocks on the performance indicators of the Iraqi economy: using the Kaldor square

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Abstract: This research is an attempt to analyze and measure the impact of structural shocks to the US dollar exchange rate on the performance indicators of the Iraqi economy during the limited period (2004 to 2022) using the Kaldor square framework, which is based on four main components (economic growth, inflation, unemployment, and trade balance). Analytical and quantitative methods were rummage-sale to reveal the countryside of the relationship between these variables, through analyzing annual data and key economic indicators, using standard economic models and applying the (SVAR) technique.

The study concluded that structural shocks to the exchange rate had varying effects on the components of the Kaldor square. The results showed a strong relationship between the exchange rate, economic growth, and the trade balance, while its impact on unemployment and inflation varied depending on the time period and political and economic developments. The study recommends adopting flexible monetary and fiscal policies that contribute to reducing exchange rate volatility and enhancing macroeconomic stability, which positively impacts sustainable structural growth.

Keywords: Economic Growth, Inflation, Iraqi Economy, SVAR Model, Trade Balance.

1. INTRODUCTION

The exchange rate is one of the most important economic variables affecting the performance indicators of the overall economy in both developed and developing countries, given that the economies of countries depend heavily on foreign trade and financial transfers. The exchange rate is of exceptional importance in the Iraqi economy, given the country's almost total dependence on oil revenues denominated in dollars. Therefore, we find that there is a close historical link between the Iraqi dinar and the US dollar.

Given the significant fluctuations in the exchange rate of the dinar against the US dollar witnessed by the Iraqi economy during the limited period (2004-2022), and the resulting economic transformations and changes, some of which are structural and others are linked to external and internal shocks, hence the need to study the relationship between these fluctuations and changes in the structure of the Iraqi economy emerged. From this standpoint, the research sought to analyze and measure the impact of structural shocks to the dollar exchange rate on the performance indicators of the Iraqi economy, by using the Kaldor square framework, which is considered one of the most prominent theoretical models in explaining the mechanisms of economic growth, as it focuses on four main components (economic growth, inflation, unemployment, and trade balance).

The Iraqi economy witnessed many economic and commercial challenges during the period (2004-2022) in light of global crises, accompanied by many fluctuations and recurring shocks in the exchange rate of the dollar against the Iraqi dinar. This fluctuation is a major source of influence on the economic structure, especially the components of the Kaldor square (economic growth, inflation, unemployment, and trade balance), which represent the

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basic pillars. Despite the importance of the exchange rate, the relationship between its structural shocks and the components of the Kaldor square in Iraq has not received sufficient analysis and academic attention. From here, the study problem begins with the following question: To what extent do structural shocks to the US dollar exchange rate affect the performance indicators of the Iraqi economy during the period 2004-2022, and what is the nature of the relationship between these shocks and the components of the Kaldor square?

2. LITERATURE REVIEW

The research is based on three main hypotheses and several sub-hypotheses, including:

Main Hypothesis (H0): There is no statistically significant relationship between dollar exchange rate shocks and Iraqi economic performance indicators within the Kaldor Square framework during the period (2004–2022).

Sub-hypotheses:

H0: There is no statistically significant relationship between exchange rate shocks and Iraqi economic performance indicators.

H1: There is a statistically significant relationship between exchange rate shocks and the components of the Kaldor Square.

To verify the research hypothesis, a set of objectives was formulated, the most important of which are:

A. Analyze the influence of US dollar conversation rate shocks on economic performance indicators during the period from 2004 to 2022.

B. Determine the relationship between exchange rate fluctuations and the components of the Kaldor square (economic growth, inflation, unemployment, and trade balance).

C. Measure the magnitude and type of impact of exchange rate shocks on Iraqi economic performance indicators using modern standard tools such as the SVAR technique.

3. RESEARCH METHODOLOGY

Using the descriptive analytical approach to study the relevant theoretical concepts (exchange rate, Kaldor square, and econometric method) to estimate the relationship between variables through standard modeling tools.

4. RESULTS AND DISCUSSION

The number of units of domestic currency that are traded for one unit of foreign currency is known as the exchange rate. Another way to define it is the quantity of foreign currency that must be purchased in order to acquire one unit of domestic currency. Thus, direct pricing and indirect pricing are the two approaches to currency pricing. The quantity of foreign currency units required to purchase one unit of domestic currency is known as "direct pricing." The quantity of domestic currency required to purchase one unit of foreign currency is known as indirect pricing. The majority of nations employ this pricing strategy. The following allows us to understand the significance of the exchange rate: (Fariha Murad, Mohamed Guedri, 2020, P. 111)

The significance of exchange rate policy: By learning about international prices and costs, exchange rates serve as a means of connecting the local economy to the global economy, or, to put it another way, connecting an open economy to the rest of the world's economies. As a result, it makes it easier to settle a variety of international transactions because it influences the national economy's pricing system, the volume of imports and exports, and ultimately the balance of payments position (Husham Mhaidi Saleh Issa Al-Fahdawi , 2025, p. 21).

Assessing global competitiveness through the use of the exchange rate as an indicator: There is an inverse relationship between competitiveness and the level of the real exchange rate. The international competitiveness of local goods declines as the real exchange rate rises because more units of the foreign commodity are needed to replace one unit of local goods. On the other hand, when the real exchange rate falls.

Reaching full employment and maintaining stability in the general level of prices and wages are two ways to accomplish the macroeconomic goals of internal and external balance. In order to achieve external balance, the exchange rate aims to balance the balance of payments in an economic sense. In addition to accomplishing the intended goals that monetary policy aims to accomplish by using the exchange rate as a target against other currencies, external payments equal external revenues. It might also contribute to lower inflation.

Functions of the Exchange Rate:

Standard Function: The exchange rate is one of the most convenient means for local producers to amount and associate the domestic prices of their various products with their prices in the international market. Therefore, the exchange rate serves as a link between domestic and international prices (Abdelhadi and Nadia, 2021).

Developmental Function: Developing a nation's domestic exports, whether they be products, semi-finished goods, or raw materials, is part of this role. Through its role in promoting these kinds of exports, the exchange rate is used to develop exports. Additionally, it causes some industrial branches to be disrupted or eliminated entirely, replacing them with imports of these goods whose import prices are less than those of importing them from overseas. As a result, the value of the local currency will decrease (Al-Battat and Al-Jashmi, 2022).

The distributive function: This is a result of its relationship to international trade, which redistributes national wealth and income among nations worldwide. The labor market, the goods and services market, and the financial assets market are the three markets through which the exchange rate connects the local and global economies and represents a link between local and global prices (Al-Baldawi, 2022).

Economic factors affecting the exchange rate: There are several economic reasons that lead to changes in currency exchange rates, including: (Fayez Muhammad Juma Al-Kubaisi, 2025 p. 322)

Exports and imports: The balance between imports and exports of goods and services determines the currency's exchange rate. The exchange rate of a nation's currency rises in tandem with an increase in its exports relative to its imports because rising exports of goods and services result in rising imports of foreign currencies, which raise the value of the nation's currency. On the other hand, if a nation's imports of goods and services increase, the country's currency exchange rate will fall because more money will be spent in the country on these imports from other currencies.

Economic and political factors: Political and economic unrest erodes trust in the national currency, which lowers demand for foreign currency. This, in turn, raises demand for foreign currency and drives up its price in the markets, while weak demand for the local currency causes its price to fall.

Government intervention: Governments, through the central bank, operate according to the monetary policy pursued by the government. In the event of an economic recovery, they withdraw currency by issuing government bonds. In the event of a recession, the government intervenes as a currency buyer, thereby affecting the currency's price in the markets.

Currency quantity: Some countries may resort to increasing the quantity of their national currency, depending on their economic policy. Increasing the quantity leads to a change in the exchange rate of that currency. The relationship between the quantity of national currency supplied and its exchange rate is inverse. The higher the quantity of currency, the lower its price, and vice versa.

Inflation: We mean local and global inflation. The continuous rise in prices leads to a decrease in the commodity value of money, which has a significant impact on the level of income or the purchasing power of individuals' income. The higher the local inflation rate compared to the global inflation rate, the lower the exchange rate. In this case, the ability of local exports to compete in global markets decreases, which leads to an increase in demand for imported goods due to their low prices compared to the price of the local commodity.

Types of exchange rates: The most significant conversation rates can be distinguished:

Nominal Effective Exchange Rate (NEER) The nominal effective exchange rate (NEER) is defined as the nominal value of a specific basket of currencies as a result of the movement of nominal conversation rates compared to base year and can be calculated as follows:

(Nominal Effective Exchange Rate) NEER = Nominal Effective Exchange Rate

Zp: Country P's share of the country r's total exports, denominated in the latter's currency

o,(epr)t (epr): Exchange rate of country p's currency in the local currency in the comparison and base years, respectively

INER¬pr: Nominal bilateral exchange rate index in the measurement year compared to the base year

Real Effective Exchange Rate (REER): is an average of bilateral real exchange rates between a country and its partners (trading competitors). Foreign trade data are often used to form weights. The real effective exchange rate is the nominal effective exchange rate adjusted for price movements in the country in question and its trading partners. Nominal effective exchange rates do not take into account price movements and do not contain information about the purchasing power of the currency. In addition, they do not reflect the development in the competitiveness of the country's export goods. There are several formulas used to find it: (Ali Tawfiq Al-Sadiq, 2020, p. 47)

}100 ……. { 1) REER=

IRERpr * 100 =

Real Effective Exchange Rate (REER):

: State price index p in the measurement and base years, respectively

: Domestic price index in the measurement and base years, respectively

The nominal exchange rate: The nominal exchange rate can be defined as a measure of the value of the currency of one country that can be exchanged for the value of the currency of another country. Currencies are exchanged for buying and selling according to their prices between each other, as the interaction of the forces of demand and supply in the exchange markets leads to the analysis of the special name of the currency of a country at a specific moment.(-Zainab Muhammad Ibrahim, Faleh Naghamish Matar, , 2025,P. 209)

Cross exchange rate: This is the rate expressed in foreign currency units for the local currency. However, there is another exchange rate called the cross exchange rate, which is the exchange rate for other currencies than one foreign currency. This means that there are two currencies that do not have an exchange rate between them, and due to the necessity of trade, they are unified at one rate.

Adjusted exchange rate: This is the rate related to the balance of payments situation, i.e., the rate related to the value of exports and imports. The following formula can be used to extract it:

AER = F(1 + (M − X) ÷ X

Where:

EAR: represents the adjusted exchange rate.

F: the current export rate.

M: for the local currency: the calculated value of exports.

X: for the local currency: the calculated value of imports.

Equilibrium exchange rate: The basic price at which all goods are exchanged in the market. The price of one currency against another is the price at which supply and demand for that currency are equal, without taking into account speculation and abnormal capital flows. Therefore, the exchange rate, like any price for a commodity or service, represents a theoretical concept. (Iman Abdul-Kadhim Jabar Al-Kuraiti, 2025, p. 262)

Foreign exchange rate shocks and their effects: Structural shocks in the context of the exchange rate are sudden and profound changes in the economic structure of a country that affect the real value of the currency in the medium or long term. Economic shocks are

generated as a result of sudden and rapid changes that lead to economic effects in a country, or in a group of countries with commercial and financial links with that country, the source of the shock. These shocks may occur in the foreign exchange market as a result of sudden economic and monetary imbalances, which will be in the form of unexpected changes in the volume of demand for capital and goods and supply at the local and foreign levels, which will be reflected in a number of economic variables at the aggregate level. The most important effects of structural shocks to the exchange rate on the performance of economic variables can be explained through the following:(Yassin Othman Abdullah, 2023,p19)

The impact of exchange rates on the general price level: Raising the exchange rate leads to a devaluation of the local currency as a result of rising domestic prices. This has a negative impact on the balance of payments, causing the country to lose some of its competitiveness. The prices of imported essential goods and raw materials used in industry and agriculture increase, raising prices and the cost of living, thus reducing the real income of society. The level of price increases depends on the country's economic structure, its ability to provide alternative goods and services, the degree of trade openness of the country that devalued its currency, and the effectiveness of its economic policies in countering the effects of changes in the foreign exchange rate.

The exchange rate can also be used as a tool to influence the trade balance. When a policy of depreciating the exchange rate of a local currency against other foreign currencies in a country diverges, this may lead to an increase in the export capacity of that country (assuming the presence of production flexibility). This policy leads to a decrease in the prices of local products compared to the prices of foreign products, which leads to an increase in external demand for local products, which increases the value of exports and improves the trade balance. The opposite is true in the case of a policy of raising the exchange rate of the local currency. The trade balance (surplus or deficit) affects the exchange rate of the local currency. In the case of a surplus in the trade balance, meaning there is an increase in exports by a value greater than the value of imports, it leads to foreign currencies entering the local economy more than they leave. This leads to an increase in demand for the local currency in the currency exchange market compared to its supply, which is reflected positively on the value of the local currency as a result of the rise in its exchange rate in the currency market, and the opposite is true in the case of a decline.(Abdul Nasser Qader Reda, 2015, p. 25)

The impact of exchange rates on GDP growth: The effectiveness of exchange rate policy changes is linked to the level of impact of GDP on the country's production structure and the extent of the contribution of imported inputs to the production process. The greater this contribution, the less possibility of local substitution, which leads to an increase in the impact of GDP growth on changes in foreign exchange rates, as the volume and value of production outputs are affected and reflected in GDP growth. The value of the decline in GDP is usually equivalent to the value of the decline in the local currency.

3-A conceptual framework for the Kaldor square - The first to address what is called the magic square, as he emphasized - Kaldor is the English scientist (Nicholas Kaldor), during the period (1980 Nicholas Kaldor) that achieving the objectives of trade policy is done through achieving four economic objectives, which he called the Kaldor magic square, through a graphical representation of the four objectives represented by the rate of economic growth, the inflation rate, the unemployment rate, and the balance of payments. These objectives aim to work to achieve the maximum level of economic growth, as well as strive to achieve full employment, work to reduce unemployment rates, and also try to achieve price stability, and achieve balance with the outside world. (Julien Flor , Lecarre Magigue, 2015,P.166)

Kaldor Square is intended to achieve the main objectives of economic policy. It is called a square because there are four main economic objectives. When the objectives are defined by points on a vertical and homogeneous graph and these points are connected to each other, you get the shape of a square. It is called magic because of the difficulty of achieving these objectives with optimal values at the same time. (Ahmed Daif, 2014, p. 21)

Kaldor argues that one of these four objectives will always be incompatible with the others. It is impossible to achieve full employment and economic growth with price stability. All studies confirm that the goal of any economic policy is to achieve general welfare. However, the latter differs from one country to another, depending on the differences between countries and the nature of their economic systems. –(Christian De Boisseaux,, 1980, p. 35)

Despite these differences in the content of economic policy between countries, this does not prevent the existence of common goals among macroeconomic policies that have been agreed upon by economists and can be summarized in what is known as the Kaldor Square.(Ibrahim Mohammed Hussein, Sondos Bahjat Jamil,2019, p. 337)

The index offers a standard by which the outcomes of numerous other indicators can be assessed. In particular, it updates the macroeconomic performance index by assigning equal weight to all four objectives. Another name for it is the economic policy magic polygon. The polygon's varied composition frequently includes a wide range of objectives, such as economic equality, environmental sustainability, and stable government operations. The polygon's name is changed based on how many corners it has. Six objectives are represented by a hexagon, and eight objectives by an octagon. These corners on the economic policy magic polygon are all the same size. The weight of all the aforementioned objectives for effective economic policy is given in order to achieve effective economic efficiency for society, by achieving stable government activity as well as economic equality in the distribution of wealth.(-8-Oliver Picek, 2017 , P: 3)

The second section: Analysis of research data and application of the SVAR technique to the research model

Analysis of Kaldor Square trends and the exchange rate in Iraq :According to the data in Table (1), the official exchange rate reached 1,472 dinars per dollar in 2005. The Central Bank of Iraq adhered to a fixed exchange rate in accordance with the established targeting policy (nominal anchor), with a certain flexibility (managed flexibility) based on the activities of the local and foreign markets and the need for the dollar. In 2010, it reached 1,170 dinars per dollar, and thus continued to fluctuate within a calm range until it reached 1,192 dinars per dollar in 2020, just before the COVID-19 pandemic. Following the lockdown, quarantine, and decline in government revenue due to the repercussions of the COVID-19 pandemic and the resulting decline in economic growth, the rate reached -12.14% in 2020, with unemployment rates rising to 17%, inflation rising to 120.31%, and the trade balance-to-GDP ratio deteriorating to -2.24%. Economic conditions began to improve after 2021, and economic life returned to normal.

Table (1): The official exchange rate and Kaldor square variables in Iraq for the period (2005-2022) (dinar/dollar, %) (2010=100%)

trade balance as percentage of GDP	consumer price index	unemployment rate	economic growth	Exchange rate	years
-7.05	58.58	18	1.68	1472.00	2005
12.41	89.77	17.5	5.64	1467.42	2006
17.71	80.73	11.7	1.89	1254.57	2007
19.6	90.95	15.3	8.23	1193.08	2008
0.11	97.20	15.1	3.38	1170.00	2009
5.34	100.00	15	6.4	1170.00	2010
16.66	105.80	12.2	7.55	1170.00	2011
15.41	112.24	11.9	13.94	1166.17	2012
11.92	114.35	16	7.63	1166.00	2013
8.9	116.91	10.6	2.26	1166.00	2014
-0.56	118.54	15	2.61	1167.33	2015
1.63	119.20	10.8	13.79	1182.00	2016
8.05	119.42	10.9	-1.82	1184.00	2017
15.8	119.86	22.6	2.63	1182.75	2018
7.11	119.62	12.8	5.51	1182.00	2019
-2.24	120.31	17	-12.04	1192.00	2020
13.27	127.57	16.5	1.58	1450.00	2021
2.61	133.95	15.3	7.55	1450.00	2022

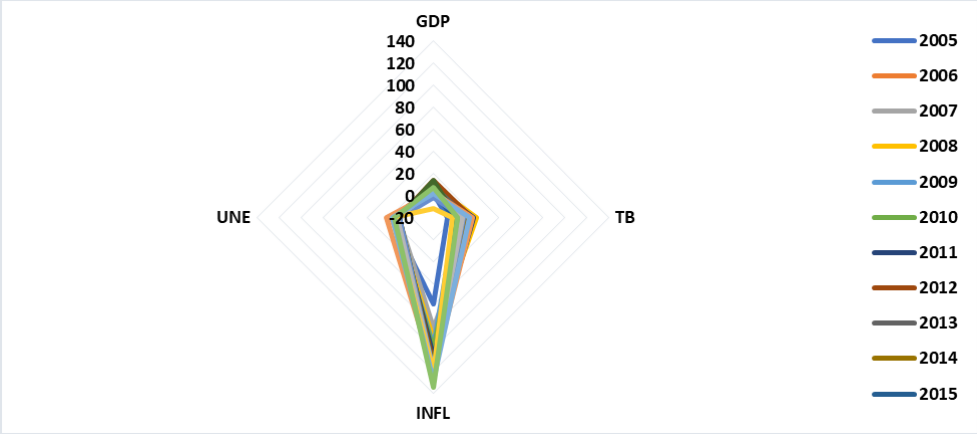
Source: Ministry of Planning and Development Cooperation, Central Statistical Organization, Department of National Accounts, various years.

- Central Bank of Iraq, Department of Statistics and Research, Annual Bulletin, various years.

- World Bank, Economic Indicators, various years.

Figure (1) confirms that the Kaldor magic square was biased towards the inflation rate during the research period. This means that economic policies were directed primarily towards controlling inflation rates and spreading monetary stability in local markets, while giving secondary importance to economic growth, the trade balance and then unemployment rates according to what was drawn up in the five-year sustainable economic development plans.

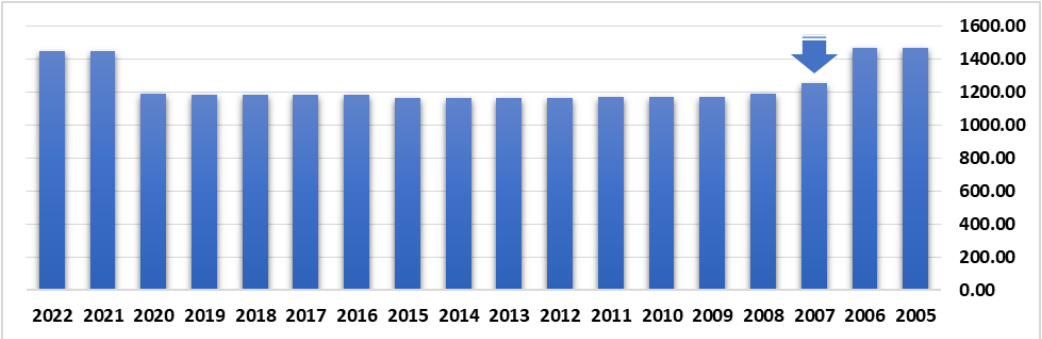
Figure (1) Kaldor square in Iraq for the period (2005-2022) (%)



Source: Researchers' work based on Table (1).

Figure (2) also confirms the occurrence of two structural shocks to the official exchange rate during the research period. The first, in 2007, was a positive shock, as the exchange rate fell from 1,467.42 to 1,254.57 dinars per dollar. This was due to improved oil revenues and, subsequently, foreign exchange reserves at the Central Bank of Iraq, and successive governments' adoption of expansionary fiscal policies. This led to a state of optimistic expectations among individuals and institutions. The second, in 2021, was a negative shock, as the exchange rate rose from 1,192 to 1,450 dinars per dollar, due to a decline in oil revenues and, subsequently, foreign exchange reserves at the Central Bank of Iraq. This caused disruption to local markets and pessimistic expectations among individuals and institutions.

Figure (2): Structural shocks to the official exchange rate in Iraq for the period (2005-2022)



Second Requirement: Application of the SVAR Technique

1. Testing Time Series Stationary :The double logarithmic formula was used, with the data segmented into quarterly data, in the Eviews13 program, as it yielded the best estimated results for the model used. Table (2) shows that the time series for the research variable were stable at a significance level of (5%), with the exception of the exchange rate variable. The economic growth time series stabilized at a level using both the constant term and non-constant term formulas. The unemployment rate time series stabilized at a level using both the constant term and time trend formulas with a constant term. Meanwhile, the trade balance time series stabilized at a level using both the constant term and time trend formulas with a constant term. Thus, these time series are free of unit roots. The first difference test was performed for the exchange rate time series, and it stabilized at a significance level of (5%) using all formulas used in the test.

Table (2): Phillips-Perron test for time series stationarity of research variables

Variables	Level Prob.			1 diffr. Prob.		
	Interc.	T & Interc.	Non	Interc.	T & Interc.	Non
Ln Ex	0.4	0.8	0.6	0.000*	0.000*	0.000*
Ln GDP Growth	0.01*	0.07	0.01*			
Ln Unemployment rate	0.005*	0.02*	0.5			
Ln Inflation rate	0.003*	0.02*	0.9			
Ln Trade balance	0.02*	0.09*	0.8			

Source: Program outputs (Eviews13).

2-Selecting the optimal deceleration durations

The process of determining the optimal deceleration durations is based on the lowest value of the criteria (AIC, SC, HQ). These criteria are the most widely used in all scientific research, and they aim to reduce variance compared to the increase in the parameters of the model under investigation. A comparison is made between models to reach the lowest value. According to the data in Table (3), the first duration was chosen in the research model.

Table (3): Optimal deceleration periods

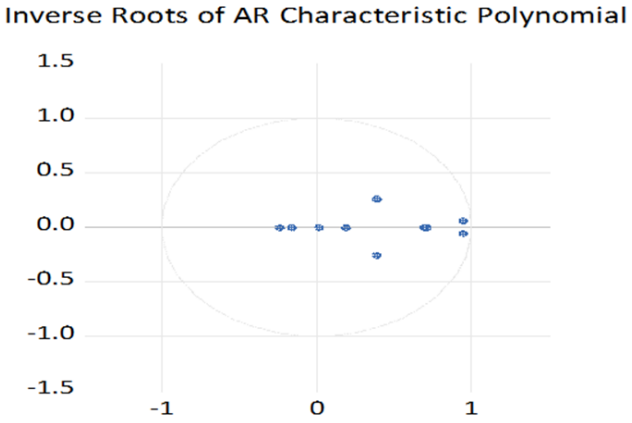
Lag	LogL	LR	FPE	AIC	SC	HQ
0	192.1683	NA	1.39e-10	-8.507649	-8.304900	-8.432460
1	376.9576	319.1815*	9.82e-14*	-15.77080*	-14.55431*	-15.31966*
2	381.6033	6.968599	2.59e-13	-14.84560	-12.61537	-14.01853
3	390.4516	11.26143	6.09e-13	-14.11144	-10.86745	-12.90841

Source: Program outputs (Eviews13).

3. SVAR Model Estimation Results

Before estimating the transition matrices from the normal model to the structural model, the stability of the estimated model must first be verified by performing the unit circle test as shown in Figure (3), which shows that all roots lie within the unit circle. Therefore, the model can be considered stable and does not suffer from errors of correlation or heteroscedasticity.

Figure (3): Single circuit



Source: Program outputs (Eviews13).

Therefore, we can now move on to calculating the values of the two transition matrices that allow us to estimate the structural impulse response functions and the structural variance analysis model, which were as follows:

$$A = \begin{pmatrix} 1 & 0 & 0 & 0 & 0 \\ -32.09 & 1 & 0 & 0 & 0 \\ -0.44 & -0.009 & 1 & 0 & 0 \\ -3.98 & -0.017 & -1.3 & 1 & 0 \\ -9.09 & -0.92 & 69.06 & -0.43 & 1 \end{pmatrix}, B = \begin{pmatrix} 0.003 & 0 & 0 & 0 & 0 \\ 0 & 0.35 & 0 & 0 & 0 \\ 0 & 0 & 0.005 & 0 & 0 \\ 0 & 0 & 0 & 0.04 & 0 \\ 0 & 0 & 0 & 0 & 0.96 \end{pmatrix}$$

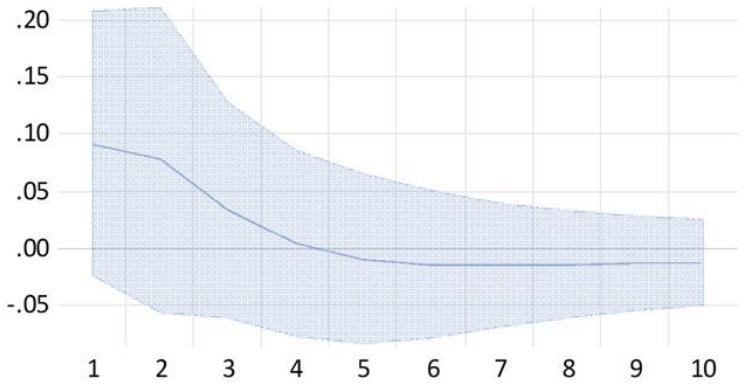
4. Structural Impulse Response Functions

Impulse response functions illustrate the response of each variable to sudden deviations and changes in other variables. The following are the results of the impulse response functions in the event of a structural shock to the exchange rate over (10) time periods, using the Kaldor square.

A. The Effect of a Structural Shock on the Exchange Rate on Economic Growth

A structural shock to the parallel exchange rate of the Iraqi dinar, as shown in Figure (4), caused economic growth to respond with a gradual decline over (4) time periods, at which point the response level reaches zero. The decline then turns negative for the remaining specified time periods. This means that economic growth responds negatively to the structural shock to the exchange rate.

Figure (4): Economic growth response to a structural shock in the exchange rate

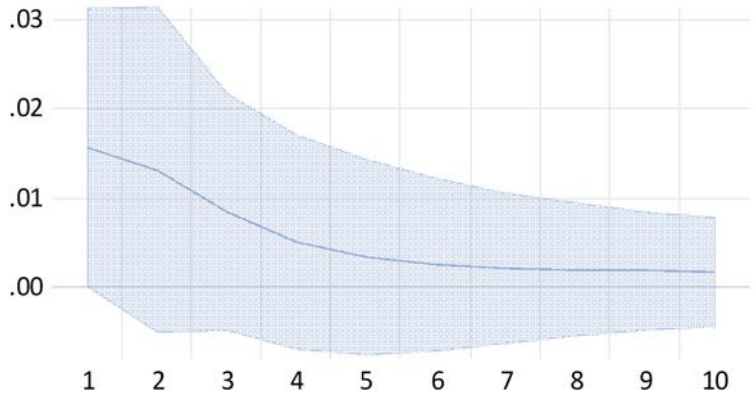


Source: Program outputs (Eviews13).

b. The case of a structural exchange rate shock on the unemployment rate.

According to Figure (5), a structural exchange rate shock positively affects the unemployment rate, as the unemployment rate gradually declines over the time periods specified in the model. This means that this structural exchange rate shock positively affects the unemployment rate, as the rise in the exchange rate stimulates local economic activity at the expense of higher import prices. This opens the way for local investors to support domestic production, increase job opportunities, and subsequently reduce unemployment rates.

Figure (5): The response of the unemployment rate to a structural exchange rate shock

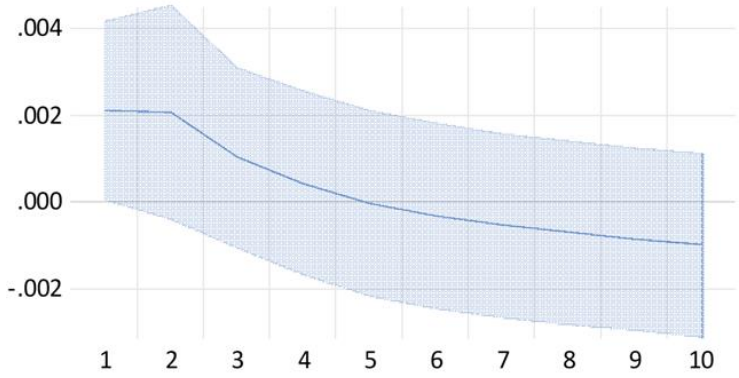


Source: Program outputs (Eviews13).

A. The case of a structural shock to the exchange rate and the inflation rate.

The occurrence of a structural shock to the exchange rate, as shown in Figure (6), results in a positive response from the inflation rate, which begins to gradually decline over the time periods specified in the model. This means that the structural shock to the exchange rate will lead to a decline in domestic prices, assuming an improvement in the business and investment environment and the government's desire to improve the economic situation.

Figure (6): The response of the inflation rate to a structural shock to the exchange rate

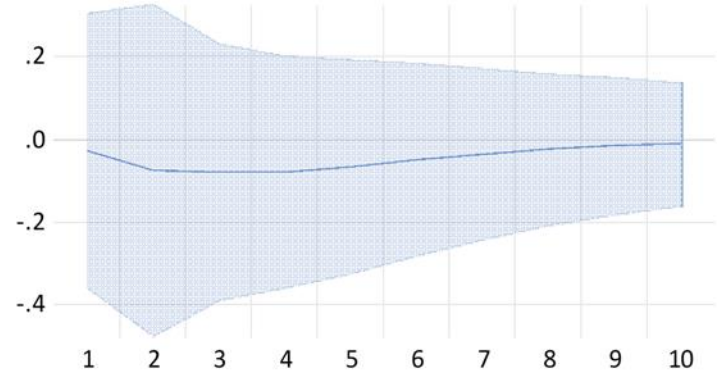


Source: Program outputs (Eviews13).

D. The case of a structural exchange rate shock to the trade balance.

The trade balance responds negatively to a structural exchange rate shock in the first and second periods, as shown in Figure (7). However, the trade balance begins to gradually increase despite the severe deterioration in the trade balance, as most exports are crude oil, and imports are significantly higher due to the local market's need for them, given the inflation of local demand over the total available supply. This means that an exchange rate shock can improve the trade balance over a period of (10) time periods.

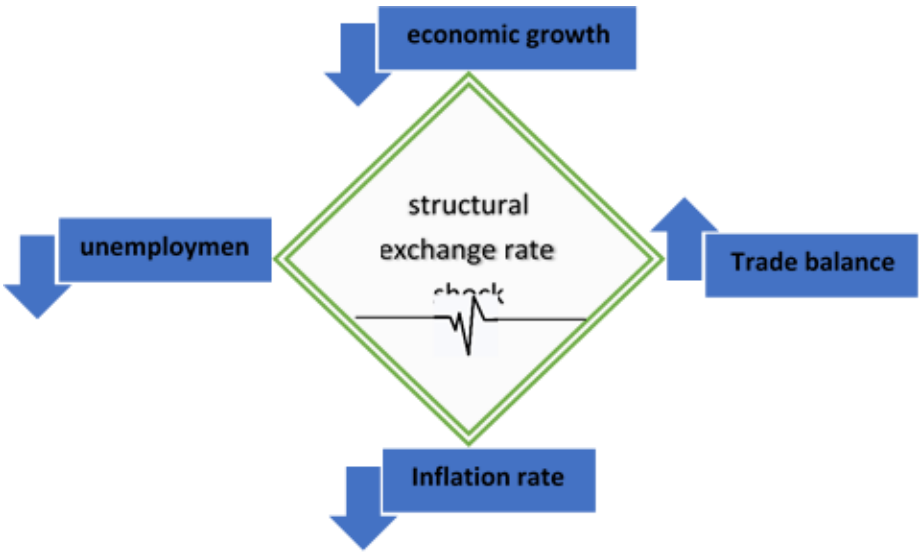
Figure (7): The trade balance's response to a structural exchange rate shock.



Source: Program outputs (Eviews13).

The occurrence of a structural shock to the exchange rate will cause a decline in economic growth due to the change in oil revenues, which has an impact on the direction of oil production and the related international arrangements regarding OPEC's share and oil export quantities. This shock will also have a positive impact on rates, as the structural shock to the exchange rate may push towards increasing investment and thus improving the process of job creation and thus reducing unemployment rates. The inflation rate has shown a positive impact on the structural shock to the exchange rate, which may reduce domestic prices and improve economic activities and activities over time. While the trade balance will witness a steady improvement as a result of this structural shock to the exchange rate, and an improvement in Iraqi exports of products, activities, events and services that will occur as a result of this structural shock to the exchange rate, as shown in Figure (8).

Figure (8): The impact of the structural shock to the exchange rate in the Kaldor square in Iraq for the period (2005-2022)



Source: Researchers' work based on model estimation results

5. CONCLUSION AND RECOMMENDATION

Conclusion

1. The structural path of the exchange rate was exposed to two shocks: the first was a positive shock, represented by a depreciation of the exchange rate, and the second was a negative shock, represented by an increase in the exchange rate. The structural impact of the two opposing shocks in the Kaldor square in Iraq during the research period revealed the following:

- Declining economic growth due to the decline in oil sales in international markets.

- Declining unemployment rates and very slow improvement in economic activity.

- A significant decline in the inflation rate due to the Central Bank of Iraq's aggressive targeting policy to maintain monetary stability.

-Very slow improvement in the trade balance.

In general, the effect was predominantly in favor of inflation rates, which is evidence of the importance and seriousness of monetary policy among macroeconomic policies in controlling economic stability and improving the Iraqi economic environment. Accordingly, the research hypothesis (that a structural shock to the exchange rate positively affects the Kaldor square in Iraq) was accepted, with the exception of economic growth and some reservations regarding the unemployment rate.

2. The economic growth rate ranged between 1% and 7% during the research period, with a decline in 2020 due to the economic repercussions of the COVID-19 pandemic.

3. The trade balance declined in 2005, 2015, and 2020, while in the remaining years it ranged between 0.11% and 16.66%, experiencing very sharp fluctuations during the research period due to fluctuations in the international oil market and the significant economic disruptions they caused to the Iraqi economy.

4. The timeline of the consumer price index has been on an upward trajectory due to weak domestic production and rising imports to keep pace with successive increases in aggregate domestic demand for goods and services.

5. Unemployment rates in Iraq ranged between a low of 10.6% in 2014 and a high of 22.6% in 2018 during the research period. Overall, they were very high due to weak economic performance and the unstable security, political, and economic conditions during the research period , Developing a flexible monetary policy that allows the exchange rate to be controlled within a stable range, reducing the impact of external shocks.

Recommendations

Diversify national income sources to reduce dependence on the dollar and oil revenues, thus reducing sensitivity to exchange rate fluctuations.

Stimulate investment in non-oil sectors and provide stable financial and legislative facilities for local and foreign investors.

Promote non-oil exports by supporting industry and agriculture, and improve the quality of Iraqi products to become more competitive internationally.

Improve the collection and analysis of economic data on a regular and accurate basis, which will contribute to making evidence-based and predictive decisions.

Enhance cooperation between the Central Bank and economic institutions to monitor and analyze market behavior and proactively control exchange rate shocks

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