EXCHANGE RATE FLUCTUATIONS AND THEIR IMPACT ON THE IRAQ`STRADE BALANCE: AN ECONOMETRIC ANALYTICAL STUDY FOR THE PERIOD 2010-2024

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Abstract
The influence of the Iraqi economy is closely related with the amount of oil revenue that can be generated by the Iraqi economy, as the oil revenues are one of the important factors that have affected the economic picture of Iraq. In this regard, the study was aimed to study the following: 1- Econometric analysis method of studying the differences between the rates of the currencies and their impact on the trade balance of Iraq during the period (2010-2024). The research has significance as it attempts to explain the impact of exchange rate fluctuations on exports and imports and the overall activity of international trade in a small and undiversified economy, typical of a rentier economy. From the empirical results, it could be inferred that there is a negative relationship between trade balance (Y) and exchange rate (X). The estimated value of the coefficient shows that a 1% increase in the exchange rate leads to an increase in trade balance by 0.8754. This is because it is very dependent upon oil revenues and extremely sensitive to exchange rate fluctuations that can cause very volatile trade balance. The results have also indicated that the non-oil productive sectors have been contributing little share to the foreign trade trade of Iraq and that the oil products trade is still the main contributor to foreign trade trade in Iraq. In addition, the depreciation of the Iraqi dinar has contributed only slightly to the boost in non-oil exports, and has exerted downward pressure on price soared imports of goods and services and contributed to inflationary pressures. Furthermore, the world's oil price fluctuations have a larger effect on Iraq's trade balance than the fluctuations in the exchange rate. It therefore suggests that the economic policies adopted should focus on diversifying and expanding the productive base of the economy; support the industrial and agricultural sectors; promote non-oil exports, and minimize reliance on oil earnings. These would improve the trade stance of Iraq.

1. Introduction

Countries that have economies heavily dependent on exports, particularly those that heavily rely on a single product or a natural resource are very sensitive to fluctuations in exchange rates and the effect they have on trade balances. This susceptibility is particularly pertinent to Iraq, since the national economy is mostly reliant on crude oil exports and is thus significantly affected by fluctuations in global markets and currency exchange rates. The exchange rate is an indicator that plays a very significant role in the economy of the nation, so it is an extremely important indicator. It shows the strength of the local currency and its importance and relationship to others and one of the most crucial factors affecting the foreign purchasing power of the Iraqi dinar. Change of exchange rate can have a direct impact on the competitiveness of Iraqi products and services in international markets, costs and volume of imports, foreign and local investments choices, overall price index and purchasing power of the currency.

These changes in exchange rates can thus have a profound impact on Iraq's balance of trade. Furthermore, the structural nature of the consequences is highly dependent on the structural nature of the Iraqi economy, especially in the fact that it remains so heavily dependent on oil exports and has a very narrow export sector of its economy and non-oil sector of production. Changes in the rate of exchange may have very different effects on the trade balance in Iraq, where

a lot of the total exports are crude oil. The results of the research reveal that devaluation of the currency might have positive economic impacts on the Iraqi economy, among others, in terms of competitiveness of local production and reduction in the demand for imports. Such positive effects are however limited and the benefits may not be realised fully without considering the effect of exchange-rate competitiveness; Iraq's export earnings depend not only on the competitiveness of the exchange rate, but also on the volume of crude oil that they produce, the oil prices in the world, and the conditions of the international energy market. According to the results presented by the applied econometric models, in the short-term, an increase in the exchange rate, which reflects the depreciation of the Iraqi dinar against foreign currencies, could be related to improving the trade balance.

This phenomenon could be attributed to the higher import prices of the home market which would result in the reduction in the demand for home imports. This linkage seems to have become less strong or weaker over the years due to the ongoing reliance on exports to oil markets, the price of oil and the importation of consumer and capital goods. The research is divided in two things. The research consists of two major sections. The first part of the book gives the theoretical background of exchange rate variations which includes definition, characteristics, types and major economic and monetary determinants of the variations. The concept and significance of the trade balance will be reviewed in the next section and the effect of exchange-rate fluctuations on Iraq's trade balance will be critically discussed during 2010-2024. The examination is based on the official statistics of the Central Bank of Iraq as well as the relevant academic research, published economic research and expert reports. The research purpose is to explain the interaction between exchange rate changes and the Iraqi trade balance (both in theory and empirical analysis) and to test if the relationship is different in the short run and long run.

1.1. Research problem

The study's main challenge is providing an answer to the following question: Did exchange rate variations improve or worsen Iraq's trade balance between 2010 and 2024?

1.2. Importance of the research

The value of this study can be referred to the contribution it made in deepening the structural aspects of the Iraqi economy which still stands on the oil income bases. In this context the balance of trade deficit/surplus is closely related to the international oil price fluctuations and exchange rate fluctuations. So far as foreign currency earning is concerned, the important variables are the oil exports, which in turn will have to do with the external trade position of the country, and economic stability. The study also helps in understanding the degree of impact of the policy of exchange rate on the performance of Iraq's foreign trade. The analysis will focus on the trade balance, the exchange rate and foreign trade (export/import) relation and will try to determine the relation between the monetary variables and the foreign trade variables under the economic environment of the rentier. Moreover, the study contributes to the academic discussion on the design of successful economic policies to support economic stability, diversify the economy and minimize Iraq's over-dependence on the oil sector.

1.3. Research objective

This study aims to analyze the development of the exchange rate between the Iraqi dinar and the US dollar during the years (2010–2024), to describe the idea of exchange rates, the various exchange rates, and the factors determining the exchange rates. In addition, it seeks to study the concept of the trade balance and its importance in the Iraqi economy, as well as to evaluate the official statistical and academic studies on the effect of exchange rate changes on Iraq's trade balance.

1.4. Search model

Depicts a suggested model to show the study variables (1):

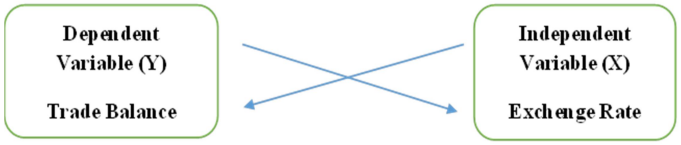


Figure 1. The study variables
Source: Researcher's work.

1.5. Research hypothesis

Based on the general hypothesis which is that fluctuations in the exchange rate have an effect on the Iraq trade balance during the period (2010-2024) statistically significantly. In particular, the positive impact of the rise in the value of the US dollar against the Iraqi dinar (or the fall in the value of the Iraqi dinar) will be seen in the trade balance in the short term. This can be achieved by the rise of domestic prices of imported products, which could decrease the demand for imported products and consequently enhance the trade balance. This relationship may, however, become less clear in the longer-term in terms of direction and nature. The structural features of the Iraqi economy such as its high reliance on imports, low productivity in the non-oil sector, lack of non-oil exports and the dominance of crude oil in the export structure may be responsible for this uncertainty. Therefore the long term elasticities of exports and imports in response to exchange rate movements may be reasonably low, as well as the impact of the exchange rate devaluation, needed to reach a sustainable trade balance in Iraq.

1.6. Theoretical foundation for trade balance and exchange rates

1.6.1. The notion of exchange rates

Typically, the exchange rate refers to the value at which one currency may be exchanged for another. This, in effect, will correspond to the velocity at which an individual must acquire one unit of foreign currency and/or the quantity of foreign currency that may be exchanged for a single unit of domestic currency. The exchange rate denotes the correlation between the local currency and foreign currency for conversion purposes, quantitatively represented as a relative value between the two currencies (Na'meh, 2012).

Another way to try to define the exchange rate is the “relative price of one currency in terms of another currency.” It can be expressed as the amount of foreign currency unit you can purchase for one unit of domestic currency or the number of domestic currency units required to purchase one unit of foreign currency. "Accordingly, it is the valuation of the national currency against foreign currency, and the main engine of exchange of currencies in the international and national financial markets is the currency exchange" (Al-Hamzawi, 2004).

The term exchange rate, according to the IMF, is the price of one currency in terms of another. That is, the value of the country's currency compared to the currency of some other country. The emphasis in this definition is that the exchange rate is one of the most significant measures to use to measure and compare relative prices between countries. Therefore, the price volatility of exchange rates impacts the prices of traded goods, the competitiveness of the domestic goods and buying power of national currencies in the global market (Subhi & Awad, 2023).

In addition, the exchange rate is the rate at which the currency of one country can be exchanged for another currency per World Bank World Development Indicators (WDI) 2022. Rates are the price relation between the foreign exchange markets currencies and can be used to weigh

the buying power of market price of national currencies. Moreover, the exchange rate is an important macroeconomic indicator as it determines the performance of the country economy, its stability and strength (Al-Maamouri & Al-Zubaidi, 2022) and also it is a tool for converting currency and exchange of currencies.

"The Organisation for Economic Co-operation and Development (OECD) also calls the exchange rate the price by which the one currency can be exchanged for another and, in financial and foreign exchange markets, the relative values of currencies, In this perspective the exchange rate is intrinsically related to the prices of goods and services, financial assets and capital flows associated with international trade and investment operations, and influences the process of international trade and investment". The exchange rate, therefore, can have an impact on the external financial position, foreign investment flows, import spending and export competitiveness of an economy (Al-Tamimi, 2022).

Furthermore, the exchange rate is regarded as one of the essential economic instruments which impact the exchange between the domestic and international prices. Relativ prices of exports and imports will be changed with the changes of value of a country's currency. With the dropping of the home country's currency, the local producers can be more competitive to the foreign buyers because the home country's currency is dropping in value. At the same time, it increases the expenses of domestic imports of goods and services. On the other hand, if the value of the domestic currency is positive, domestic exports will become less competitive on the foreign markets and domestic imports will be less competitive. Hence, the exchange rate policy could influence export–import preferences, and influence the foreign trade policy performance of a country (Al-Tamimi, 2022).

From the above definition, it can be seen that the exchange rate is the rate of price of one country's currency that can be exchanged for another currency. It serves as an important link between the domestic economy and the international economy and in addition it is also a crucial instrument to conduct international trade, investment and financial transactions. Furthermore, it is considered as an important factor of economic viability, stability and competitiveness of a country's economy. It also allows for a comparison of the relative prices of goods and services on the international markets, and impacts on key economic variables like exports, imports, inflation, capital flows, foreign reserves, and the trade balance.

1.6.2. Exchange rate types

A fixed rate of exchange

A type of exchange rate system in which the government or central bank determines the exchange rate of the domestic currency and an external currency with a fairly stable and strong currency. It may be a particular foreign currency, such as the U.S. dollar, a mixture of a number of currencies or in certain instances a valuable metal, such as gold. It is a desired level fixed or a narrow band around the fixed level at which the value of the domestic currency is supported. The central bank will have to step in to the foreign exchange market on a regular basis in order to keep the announced exchange rate. This intervention normally takes the form of buying or selling foreign currencies based on the changes in the market demand and supply. The Central Bank will decrease the amount of foreign currency if there is a high demand for foreign currency, in the process foreign currency assets may be sold to support the exchange rate of domestic currency. In case the domestic currency is at risk of being valued up then, however, the Central Bank can buy foreign currency to counteract the valuation up of the domestic one, but the valuation of the foreign one should not exceed the margin. In some economies this system is followed, particularly in the economies which desire the monetary and exchange rate stability. For example, in Qatar, the exchange rate of the riyal is set, in this case to the US dollar. Its prevalence is particularly high in the countries where the international prices of commodities are more important and financial transactions more so in USD.

An important advantage of using a fixed exchange rate regime is the size of stability and predictability that it provides regarding international economic transactions. If the exchange rate is not volatile, it will take the uncertainty out of exporters, importers, investors and financial institutions minds because the exchange rate risks will be lowered. This stability might help to

maintain foreign trade, attract foreign investment, ease long-term economic planning and boost the confidence in the national currency. Further, the domestic currency could be stabilised by pegging it to a stable foreign currency that would aid in controlling inflation as well as price of imported commodities that depreciate the domestic currency.

Even with these benefits, there are a number of drawbacks to a fixed exchange rate system. It is especially harmful to the independence of monetary policy, a major worry for the central bank: the central bank will have to be the most concerned at the stability of the currency's peg. This may limit the ability of monetary policy makers to act, including their ability to influence interest rates, the amount of aggregate liquidity in the economy, and their ability to respond to the changes in the inflationary and employment outcomes, growth and other macroeconomic variables. This may result in a large impact on the domestic monetary policy stemming from the anchor country's monetary policy.

Another drawback of a fixed exchange rate is that the central bank must maintain foreign currency reserves to buy and sell foreign currencies as necessary to uphold the fixed exchange rate. A considerable strain on the national currency may lead to substantial intervention by the central bank in the currency market. Maintaining the peg might become more difficult and costly if the official currency rate diverges from the nation's economic realities.

Moreover, an overvalued currency may cause a foreign exchange market to be distorted. The official rate may be either above or below the market equilibrium rate and there may be a demand for foreign currency which is greater than the supply of official foreign currency. This can result into the shortage of foreign currency, speculation, flight of capital and development/growth of the parallel exchange market. This official/parallel rate differential could then impact the effectiveness of the fixed exchange rate system and reduce confidence in monetary policy. Essential conditions for the successful operation of the fixed exchange rate system are the quantity of foreign exchange reserves, the credibility of the central bank, fiscal discipline, export income stability and the existence of an exchange rate that is consistent with the prevailing economic conditions. However, if the fixed rate is to remain, the non-compliance of the above would put a heavy economic and financial burden on the country (Mokhtari, 2018).

Exchange rate fluctuation

In this system there is no official target price for the freely floating currency, it is governed by the economy's forces of supply and demand. There is no price set by the government and/or the central bank, but if the rate moves around too much, then the floating exchange rate has the flexibility to let the economy adjust to a shock, for instance, a decrease in exports triggers an automatic decrease in the value of the currency, making exports competitive and balancing the trade imbalance. The disadvantages of it though are that the currency could quickly rise and fall in value, which would necessitate adjustments in economic planning, and imported inflation if the currency's value fell sharply (Subhi & Awad, 2023).

Controlled exchange rate

It is a policy of an intermediate type: a managed floating exchange rate: a balance between stability and flexibility in the exchange rate. In this scheme, the value of the money becomes free and the monetary authority takes steps to eliminate the excessive changes in the value of money or to remove the undesirable trend of the value of money in long run. The fixed exchange rate would generally be given a tolerance range and be intervened if it crosses the tolerances. This is normal in developing nations that desire flexibility in the marketplace nonetheless not any type of significant currency modification. Several forms of managed floating have been employed in other countries, such as Algeria, Argentina and Afghanistan. The flexibility that the system offers, however, is dependent upon the authorities' ability to adjust rates from the set rates drastically, and to keep the exchange rate within a reasonably stable rate (Al-Tamimi, 2022).

1.6.3. Factors affecting the exchange rate

Many economic and financial variables influence exchange rates and come into play to influence the supply and demand in exchange against foreign currencies. Some of the most obvious of these are:

Trade situation and balance of payments

Some of the big factors which impact the value of a country's money are trade balance and the balance of payments. When export value exceeds import value, foreigners will want to purchase the country's currency as they require it for an import of goods or services from the country. This increased demand might assist to appreciate the exchange rate. But, if a trade imbalance continues on that will result in a decrease in the value of the domestic currency, since it will need to buy more foreign currency than usual to acquire the products. The effect of global oil prices on the exchange rate of the Iraqi dinar is also significant in the case of Iraq, as most of the country's exports are in oil products, which is part of Iraq's trade balance with the oil price in the world (Ziad & Daadoush, 2019).

Monetary policies and interest rates

With direct link monetary policy the central bank is directly connected with the exchange rate. The rise in home interest rates will attract foreign capital to the home country for higher home country risk/reward on their financial investment, thus increasing demand for home currency and appreciation of home currencies. On the other hand, when the interest rates are lowered, over-issuing of money can make the home currency less desirable, and cause its devaluation. The other important variable which has an impact on the value of the currency is the money supply. When money supply is too large, without production or any economic activity, then the purchasing power will decrease and also the external value of money, and this would be an inflationary trend (Musa'idiyah, 2019).

Inflation rate

Difference in inflation rate of two countries and their key trading partners is one of the major determinants that impact the exchange rate. The country could have a higher inflation rate than the rest of the world, which means the domestic currency will lose its purchasing power in the domestic market as well as foreign markets. Where domestic goods are cheaper than foreign goods, it is likely that countries in that situation will import more foreign goods than they export domestic goods. This will decrease the demand for the home currency from abroad, and lead to a devaluation of the home currency. Therefore, steady and low level of inflation contributes to ensure currencies are stable and strengthen the national currency in the long-term.

Foreign reserves

One of the sources of trust in the national currency is an external monetary reserve of the central bank. Foreign reserves (foreign currencies, gold, others) are increased, which in turn increases the powers of the central bank to carry out foreign exchange market interventions to introduce hard currencies when there is a need. This intervention can be employed to smooth out any fluctuations and to ensure exchange rate stability. Furthermore, a reserve size will provide space for manoeuvre in buying foreign goods, as well as settling foreign obligations. It not only boosts investor confidence in the economy, but also helps to strengthen the value of the national currency (Yara, 2018).

Stability in politics and security

For the national economy, the demand for the national currency will be affected by the public's trust in the national currency and the exchange rate. Uncertainty over the policy of the government, political instability and security disturbances could lead to a lack of confidence in the domestic economy. Therefore all individuals and foreign capitals can move their investment and savings to the other currencies which are more stable and can bring about capital flight which will lead to depreciation of the local currency. On the other hand, political, security and institutional stability facilitates foreign investment and boosts confidence on holding the national currency. A stable political and economic situation, therefore, can facilitate the currency and ensure exchange rate stability (Hussein, 2020).

Other factors

Other factors speculators and their market expectations can influence the price of the currency either up or down, depending on their expectations. Also, the confidence in the currency is influenced by the public debt: A high public debt may cause concerns about financial stability and thus a depreciation of the currency. Lastly, local currencies of emerging markets may be impacted

by international investment flows due to the effects of global economic developments on the flow of international investments (Musa'idiyah, 2019).

1.6.4. The notion of the trade balance

The difference between the value of the exports and imports of a country for a particular period is the trade balance. When the value of goods and services exported exceeds the value of those imported from the outside, it is called trade surplus and when the value of the goods and services imported from the outside exceed the value of the goods and services exported, it is called trade deficit. One of the balances of payments is the trade balance a measure of economic transactions between the country and the rest of the world. It also gives an idea of the competitiveness of the country in the international market place and the dependence of the country on the foreign markets. Mohammed (2016) argues that the continuous surpluses would imply that the country has good productive and export capacities while the continuous deficits would imply that the country is heavily dependent on imports and the capacity of the domestic production base is low. Differences of opinion on what should be included in the trade balance. In some cases definitions only include visible trade (goods exports and imports) and in others invisible trade (invisible service exports and imports). Generally, the trade balance is an external financial condition measure of a country, which is measured based on the difference between the external value of the visible and invisible transactions of the country (i.e. export and import) (Tayeh, 2024).

1.6.5. The significance of the trade balance

The trade balance is a part of gross domestic Product (GDP), the difference in exports and imports. It also is directly linked to the exchange rate with the expectation that countries that have a trade surplus will experience greater demand for their currency. However, if the trade deficits go on for extended periods of time, and are large enough, then the national currency's value may eventually decline. There is also a high correlation between the level of foreign exchange reserves and the trade balance. A trade surplus brings in more foreign currency, to the benefit of the official foreign exchange reserves and allows the monetary authorities more choice when making decisions. But, when there is a trade deficit, it may lead to the reduction in the foreign reserves or resort to borrowing from abroad to finance trade deficit. Secondly, the balance of trade in a national economy is a sign of diversification and its level. The fact that strong export dependence is on a single product or a few products means the trade balance is more vulnerable to international commodity price and market fluctuations (Tayeh, 2024).

1.6.6. Trade balance types

There are two types of trade balances: 1) the visible trade balance, which involves all the goods and services that have a physical form, including exports and imports of physical goods that cross customs borders. The visible trade balance is the value of the country's exports of physical goods. 2) the invisible trade balance, which is the balance of exports of services in a country. It is worth noting that the trade balance does not include just the trade of goods; rather, the services balance, which represents the invisible part, contains the value of international exchanges of services by residents in an economy with non-residents, by trainees with residents, and by non-residents in an economy with trainees. Furthermore, all types of service transactions between countries, such as labour income, capital gains, tourism, insurance, and transportation, are included in the services balance (Al-Rubaie, 2024).

1.6.7. The fundamental elements of the trade balance

From the perspective of the trade balance, it is broken down into the merchandise trade balance, the services trade balance, and transfers. The merchandise trade balance (visible trade balance) is the trade balance in which the value of a country's exports and imports of goods (excluding services) that cross tangible and physical borders is recorded. In addition, the invisible trade balance represents the net value of exports and imports of intangible services, as well as the net value of exports and imports of intangible goods and services, including visible and invisible income and services that are exported and imported but are not tangible. Furthermore, the transfers account consists of one type of transfer, namely unpaid internal and external transfers. Its registration procedure is the same as that of other types of accounts and includes non-refundable transfers, SWIFT transactions, informal exchanges, grants, and donations. Under this account, the State, governmental bodies, or any other entity are not liable for any refund (Al-Rubaie, 2024).

2. Method

This study employed a descriptive and analytical research design to examine the impact of exchange rate fluctuations on Iraq's trade balance during the period 2010–2024. The analysis was based on secondary data obtained from official statistical publications, including the Central Bank of Iraq, the Iraqi Ministry of Planning, the Iraqi Customs Authority, and other relevant governmental reports, as well as previous academic studies related to exchange rate policy and trade balance. The study used the exchange rate of the Iraqi dinar against the US dollar (ER) as the independent variable and the trade balance (TB) as the dependent variable. To provide a comprehensive understanding of the relationship between these variables, descriptive statistical analysis was first employed to examine the development of the exchange rate and the trade balance over the study period. Subsequently, the Autoregressive Distributed Lag (ARDL) model was adopted to investigate both the short-run and long-run effects of exchange rate fluctuations on Iraq's trade balance, as the ARDL approach is appropriate for variables integrated at different orders, provided that none of the variables is integrated of order two (I(2)).

Prior to estimating the ARDL model, the stationarity of the study variables was examined using the Phillips–Perron (PP) unit root test to determine their order of integration. After confirming that the variables satisfied the requirements for ARDL estimation, the ARDL Bounds Testing approach proposed by Pesaran et al. was employed to examine the existence of a long-run cointegration relationship between the exchange rate and the trade balance. Once cointegration was established, an Error Correction Model (ECM) was estimated to evaluate the short-run dynamics and the speed at which deviations from the long-run equilibrium were corrected. Finally, several diagnostic tests, including the Jarque–Bera normality test and the Breusch–Godfrey serial correlation test, were conducted to verify the validity, reliability, and robustness of the estimated ARDL model.

3. Results and Discussion

3.1. Developments in the Iraqi trade balance 2010-2024

A significant change in the trade balance of Iraq had taken place from 2010 to 2024. The fluctuations were mainly attributed to the movement of prices of oil, since the Iraqi economy is very sensitive to exporting crude oil as a source of foreign currency revenues. The impact of exchange rate, import and public expenditure policies in the domestic economy on the performance of trade balance was also responsible for the variations in performance of the trade balance.

3.1.1. Variations in exchange rates from 2010 to 2024

Iraq experienced fairly large trade surpluses in the initial few years of this study period. The trade surplus amounted to approximately USD 8.6 billion in 2010 and increased to more than USD 35 billion in 2011 when oil prices increased in the world. But in 2012, the high oil prices, combined with record high prices for the oil price of nearly USD 112.00 per barrel of Brent, maintained the surplus at USD 35.4 billion. Although the global fall in oil prices started in the latter part of 2014, Iraq continued to record its substantial trade surpluses of around USD 28 billion a year in both 2013 and 2014 (Annual Financial Stability Report, 2014)

All of this was changed by last year (2015) when the price of world oil declined quickly and dramatically, impacting so heavily on Iraq's oil export revenues. This caused the trade balance to soon deteriorate to the small negative value of USD 0.94 billion. This was the first time in many years that Iraq had a trade deficit, and an indicator of the severity of the external price shock on the oil dependent economy. The government implemented austerity measures but did not allow the exchange rate to be changed. Consequently, the response to the crisis was mostly shaped by the drop in public revenues, and the drop in government spending rather than by the exchange rate depreciation.

In 2016, the prices of oil partially recovered which assisted in the recovery of estimated USD 6 billion trade surplus. Surplus has risen over the past few years and stood at USD 12.15 billion in 2017 and jumped to nearly USD 35.95 billion in 2018. The surplus in 2018 was the second highest since 2012 in order to enhance Iraq foreign exchange reserves and financial position in the study

period. But with the fall of oil prices and an increase in the costs of imports, the trade surplus for 2019 fell to around USD 16.6 billion (Bakhtiar, 2021)

One of the other major events of 2020 was the COVID-19 pandemic that resulted in global restrictions on oil demand and prices, causing a decline that no one had seen before. Oil exports dropped significantly in Iraq and the nation had continued to rely strongly on imports of goods and services. This resulted in high trade deficit in some instances of USD 4.1 billion. In parallel, there was a great deal of fiscal stress and the government lacked the money to cover public expenditure and to be able to pay public-sector salaries regularly. The Central Bank of Iraq (CBI) has kept the official exchange rate for USD around IQD 1182-1190 for most of 2020, and has resorted to utilizing part of its foreign currency (FCU) reserves to import commodities and meet the demand for foreign currencies.

The Iraqi government devalued its currency by some 22% in December 2020, bringing the exchange rate of the official dinar down from IQD 1,182 to IQD 1,450 for a single USD. The decision's intent was to ease pressure on foreign exchange reserves, to boost the dinar value of oil revenues brought in in foreign currency, to shore up public finances and to curb too many imports by making them more expensive in domestic currency. This was an administratively managed system rate adjustment measure which has been implemented as the emergency measure during the financial crisis (Subhi & Awad, 2022).

The trade balance had been significantly improved in 2022 which was a phenomenal year in the revenue of Iraq's oil. The world economy's recovery and the start of the Russia–Ukraine conflict led to the sharp increase in world oil prices. Total oil revenues for Iraq were around USD 115 billion and at the same time, crude oil averaged around USD 100 per barrel. This resulted in the trade balance during the study period being one of its largest surpluses of USD 53.5 billion. With no payments made to foreign oil companies, total oil exports would have been almost USD 71 billion. With this crucial development, the Central Bank's foreign exchange reserves have now reached USD 90 billion at the end of 2022 (Obaid, 2024).

Once again in 2023, the dependence on oil was observed in Iraq. Global oil prices dropped relatively and Iraq's decision to slash oil output quotas of OPEC+ countries led to a decrease in the value of oil exports of about 16% compared with the previous year. Meanwhile, non-oil imports increased almost 9.5% as the government increased its expenditures and demand for imports increased. The developments have helped to bring down the trade surplus considerably from 2022. Official statistics indicated that Iraq is trading in the surplus of all commodities by USD 43.2 billion in 2023. The overall surplus was brought down to the approximate level of USD 26.7 billion by an adjustment for the deficiency in the services sector (e.g. transportation, travel and remittance costs). The loss of foreign currency revenues also impacted negatively the development of Iraq's non-oil economy (Latif et al., 2023)

Iraq maintained a trade surplus in 2024 but it was much less than in 2022. It was estimated that there was a surplus of around USD 26.69 billion. This was largely attributed to the decline of oil prices from their highs of 2022, and continued increases in government consumption and investment and imports. The developments showed that trade balance of Iraq during the period was largely decided by the oil revenues, despite the ups and downs of oil revenues.

The last few years of the study period were also taken into account in the assessment of the impact of exchange rate policy on foreign trade. In early 2023, the Central Bank of Iraq made a partial step towards revaluing the dinar with the introduction of a new official exchange rate of 1300 IQD to the USD. This was to relieve the inflationary pressures and to safeguard the market's exchange rate against the official exchange rate. The revaluation reduced the foreign goods prices in the dinar currency and might have stimulated the demand for foreign goods; however, the effect on the trade balance, compared to the effect of world oil prices, was not that significant. The revaluation of exchange rates may have also dampened the competitiveness of domestic products in comparison to imported products.

"This overall decline in the Iraqi trade surplus in 2023-2024 was largely due to the decrease in oil export revenues, which is not just the impact of exchange rate changes, This marked a

considerable degree of volatility in the official exchange rate over a short period of time that had the potential to negatively affect economic agents' confidence in monetary policy, however". Hence, the adjustments in the exchange rates should be brought up gradually, as they can have an impact on the inflation rates, investment decisions, public confidence, etc. (Al-Khayyam, 2024).

Table 1. The changes of the trade balance in Iraq in the period between 2010 and 2024.

Year	Exchange rate policy	Change in exchange rate	Impact on the trade balance
2010 2014	fixed price against the US -A near dollar	—	lusesLarge trade surp
2015	Continued stability and no decrease	No change, 0%	relative trade deficit
2017 2019	Continued stability in the exchange rate	—	Surplus returns to rise
End of 2020	Exchange rate decrease	22% discount	Enhancement in the net trade balance during 2021
2021	The continuous decline	—	Large trade surplus
February 2023	Raising the value of the dinar to 1300 against the US dollar	12% increase	Trade surpluses declined by a thousand

Source: From the researcher's work based on previous data.

3.1.2. The effect of changes in the exchange rate on the trade balance from 2010 to 2024

This section concentrates on the impact of exchange rate fluctuations on Iraq's trade balance performance throughout the studied period (2010-2024).This section examines the influence of exchange rate variations on Iraq's trade balance performance from 2010 to 2024.

During the period 2010-2014, the value of the Iraqi dinar was not too fluctuating in comparison to the USD. In those years, the authorities failed to make use of the exchange rate as a policy tool to reduce trade imbalance. Iraq, although the exchange rate was kept stable, had substantial trade surpluses due to high prices of oil and its resulting impact on the oil export revenues of the country. The overall "positive" impact on the trade balance was thus related more to changes in the oil industry than to exchange rates.

The stable exchange rate helped to increase foreign trade's confidence in the exchange rate and to finance imports. The strength of the dinar relative to the US dollar also helped to keep prices of imported goods in check, and to bring inflation under control, in the country. However, the price of the dinar was quite high which had a negative impact on the competitiveness of non-oil products, as they became relatively more expensive than the imported products. This in turn resulted in low level of domestic productive base (Reda, 2022) which led to low production and high imports as compared to the exports (excluding non-oil sectors).

The shock absorption capacity of the fixed exchange rate system from external shocks has been demonstrated to be very weak in the year 2015 when oil prices have failed. But the authorities have not devaluated the dinar despite the dramatic decline in the oil exports revenues. Thus Iraq was obliged to draw on its foreign exchange reserves to finance its imports, and to compensate for its trade imbalance. The official exchange rate strengthened, and was able to compensate for the purchasing power losses at a different rate than the oil production rate. This in turn implied that the export revenue did not decrease proportionately with the decrease in import expenditure and this exacerbated the foreign reserves constraint for the country. This experience exposed the drawback of a fixed exchange rate regime in facing significant fluctuations in an economy's external environment (Reda, 2022).

Oil prices have risen in the past two years (2017-2019), while the official exchange rate has been stable, thus causing Iraq's trade surplus to rise. The value of the dinar was not so variable and its foreign financial position was strengthened and the government revenues were strengthened. This means that during this period price changes of oil were the main determinant of the trade balance, not exchange rate changes.

However, "the exchange rate in the parallel market was sometimes higher than the official exchange rate which indicates the pressure on the demand for foreign currencies still continued". The Central Bank of Iraq (CBI) has been assisting the official exchange rate via providing dollars via the foreign currency auction system. This policy not only enabled imports to be funded, but also helped to maintain price stability in the country. The policy to control exchange rate and a great extent control the inflation were successful, but during the oil prices fall period, the policy had negative impact on foreign exchange reserves (Al-Alousi, 2023).

In December 2020, the Iraqi dinar was devaluated and a new exchange rate policy and trade balance began. The turning point of the link between the exchange rate policy and the trade balance was in December 2020, when the official Iraqi currency, the dinar, was devaluated. The official exchange rate was lowered from around IQD 1,182 per US dollar to IQD 1,450 per US dollar, which is a devaluation of almost 22%. This change resulted in an increase in the dinar worth of oil revenue received in foreign currencies, and is likely to provide the government with local currency resources. At the same time it increased the price of imported goods in the country.

The depreciation did not in itself directly impact the oil exports price because the volume of oil exports and prices had been mostly decided by world market prices and volume of oil. But an increase in imports' price in dinars caused imports to be reduced in 2021, along with the impact of the austerity measures implemented by the government. It has helped overcome the oil price drop, and the positive changes in the oil prices at the international market, contributing to the improvement of Iraq's trade balance. Therefore, the exchange rate adjustment helped to reach the external balance by reducing imports and an increase in oil prices increased export revenues (Reda, 2022).

In February 2023, the official exchange rate of the Iraqi dinar was changed from USD1450-1460 to USD 1300.In February 2023, the Iraqi government has slightly revalued the Iraqi dinar from ~ IQD 1450/1460 USD to IQD 1300 USD. The decision was more for the purpose of facilitating foreign exchange market stability, than to help the trade balance. In Iraq, prior to the new regulations on dollar transfers, Iraq was experiencing a lack of dollars and a rapid increase in the parallel exchange rate of dollars.

The revaluation was intended to narrow the difference between the official and parallel exchange rates, and to help keep inflation at bay. Similarly, the price of imports in dinar-denomination decreased due to the strengthening of the dinar, which alleviated some of the inflationary pressures on consumers. The revaluation from a trade point of view, however, might have enabled imports to be encouraged by adding to domestic purchasing power. It also lessened the competitiveness of non-oil exports to the outside world.

This policy had not much effect on the trade balance because of the nature of the Iraqi economy. Non-oil exports make up a small percentage of the total volume of exports and many imported products are necessities that are relatively inelastic. This added some weight to the increase in imports in 2023, but mainly contributed to the reduction of the trade surplus due to the fall in world oil prices and decrease in oil export revenues.

The old weaker exchange rate would have resulted in even more imports being cut and the trade surplus is slightly larger. This policy would have, however, led to the rise of importation cost of such goods and lead to the inflation. This is one of the scenarios in which there may be trade-policy/monetary-policy conflicts. Having a stronger currency would be beneficial for the consumers as it would make imports cheaper and would help control inflation while a weaker currency would limit imports and would help enhance the trade balance, it would encourage domestic production. Therefore, the policy of the exchange rate for Iraq should be in balance between the performance and the ability to trade, price stability, and public purchasing power and development of the competitive non-oil productive industries (Al-Hajj, 2023).

3.1.3. The reality of the Iraqi dinar exchange rate (2010-2024)

In this section, the exchange rate of Iraqi dinar to USD in the years 2010-2024 is discussed. This era featured major climatic, economic, political and financial changes which had an impact on the value and stability of the national currency. For the analysis, statistical information on the official and parallel exchange rates are used. It also draws links between the changes in the rates from year to year, and the major political and economic events that affected those changes, thus establishing the connection between the two. This approach provides a better and clear idea of the movement of the exchange rate of the Iraqi dinar during the study period and the development of the exchange rate over the study period.

Table 2. Exchange rate of the Iraqi dinar relative to the US dollar in Iraq from 2010 to 2024

years	official exchange rate	Annual change rate of the % official exchange rate	parallel exchange rate	Annual change rate of the % parallel exchange rate
2010	**1170.00**	**0.00**	**1185.00**	**0.27**
2011	**1170.00**	**0.00**	**1195.67**	**0.90**
2012	**1166.17**	**-0.33**	**1232.67**	**3.09**
2013	**1166.00**	**-0.01**	**1231.92**	**-0.06**
2014	**1166.00**	**0.00**	**1213.67**	**-1.48**
2015	**1167.33**	**0.11**	**1247.42**	**2.78**
2016	**1182.00**	**1.26**	**1275.25**	**2.23**
2017	**1184.00**	**0.17**	**1258.00**	**-1.35**
2018	**1182.75**	**-0.11**	**1208.92**	**-3.90**
2019	**1182.00**	**-0.06**	**1196.14**	**-1.06**
2020	**1192.17**	**0.86**	**1233.94**	**3.16**
2021	**1450.00**	**21.63**	**1474.05**	**19.46**
2022	**1432.60**	**-1.20**	**1482.00**	**0.54**
2023	**1315.75**	**-8.16**	**1531.00**	**3.31**
2024	**1310.00**	**-0.44**	**1515.00**	**-1.05**

3.1.4. Period of relative stability (2010-2014)

The exchange rate of the Iraqi dinar remained fairly stable in most of the time between 2010-2014. No change was also made to the official exchange rate in 2010 & 2011 and it fluctuated at 0.00% (IQD 1170/1 US dollar) average rate per year. A modest increase in the parallel market rate, from IQD 1,185 in 2010 to IQD 1,195.67 in 2011, was also seen. What has helped this stability the most, is the International financial crisis and with that, the global oil prices have risen. With the rise in the oil price, the Central Bank of Iraq was able to boost its foreign currencies reserves, which led to the fulfillment of foreign currencies needs, especially the American dollar, in addition to stabilizing the foreign exchange market.

Volatility was seen in the exchange market first in 2012. The parallel market rate jumped by around 3.09%, bringing the rate to IQD 1,232.67 to the dollar. This development was coming on the back of the ongoing crisis in Syria and rising tensions in the region in the political and security sphere. These circumstances led people and investors to demand more of the United States Dollar for speculation, wealth building and as a hedge against political and economic risk and volatility.

Foreign exchange market gradually returned to some sort of equilibrium in 2013 and 2014. The parallel rate fell by an estimated 1.48% to IQD 1,213.67 to a dollar in 2014. However, it wasn't to last. Iraq saw two important events during the Middle of 2014 which had adverse effects on the economy and on the exchange rate. The first was the ISIS seizing and quickly taking control of Mosul and the second was the dramatic drop in oil prices. This would pave the way for the economic and financial crisis of the coming several years.

3.1.5. The period of double shock and recovery (2015-2019)

There were two big shocks in 2015 and 2016 – first world oil prices plunged, and second, international financial costs of the struggle against ISIS have increased. The selling price of the Iraqi dinar in the parallel market increased by a few 2.78% in 2015, indicating that the dinar was depreciated. This upward trend this 2016 was maintained at the same rate of around IQD 1,275.25/US dollar. The drop in oil prices led to a shortage of foreign exchange; the military and security spending had its impact on public finances, and increased the concerns about the national currency.

The Iraqis dinar started to follow a gradual recovery in the parallel market from 2017 until now due to the improvement of the economic and security situation. The parallel exchange rate fell around 0.90% in 2017 thus strengthening the value of dinar. A larger drop of 5.13% was seen in 2018, reaching almost IQD 1,208.92 per U.S. dollar. It has also experienced further developments in 2019, and the foreign exchange market is a more stable one.

Most of the recovery was attributed to an end to the massive military operations against ISIS, a relative calm and stability, and improved oil prices on the international marketplace. All these developments have resulted in restoring Iraqi's foreign currency revenues, financial position of Central Bank of Iraq and restore the confidence of the Iraqi people on the Iraqi dinar.

3.1.6. Period of partial transitions and constraints (2020-2024)

In 2020, the trend in the exchange rate turned back with the parallel market rate rising by around 3.16% to IQD 1,233.94/US dollar. This was due to the depreciation of the Iraqi dinar, and was primarily caused by the COVID-19 pandemic's effect on the economy. Declines in global economic activity, closures because of the pandemic and a sudden drop in oil prices had a huge impact on Iraq's public revenues and foreign currency earnings, resulting in a major fiscal and financial crisis.

This was the year with the biggest change in exchange rates during the time period. The official exchange rate increased on average by 21.63% (from IQD 1192.17 to 1450 per USD). Likewise, the parallel market rate went up by an average of 19.46%, from IQD 1,233.94 to IQD 1,474.05 per US dollar. The rise in these prices were mainly attributed to a heavy drop in the value of the Iraqi dinar and its official exchange rate, which the Central Bank had changed in December 2020. The main objective of the measure is to decrease the public budget deficit, the stress on foreign currency reserves, and the value of the dinar revenues of the Government from oil.

In 2022, the foreign exchange market started to feel the effects of the devaluation, and began to normalise around the new official exchange rate. The high global oil prices following the Russia–Ukraine conflict have also contributed to Iraq's foreign currency revenue, and therefore, a significant rise in the Central Bank's foreign currency reserves, has also added to the stability. The parallel market exchange rate therefore, varied by just 0.54% during the year.

The conditions of the exchange rates in 2023 were more complicated. The official exchange rate dropped to IQD 1,315.75 in an annual average basis (8.16% appreciation from the previous official rate). The rate of the parallel market, on the other hand, rose by about 3.31% to reach IQD 1531 per dollar, signaling more depreciation in the unofficial exchange market. The gap had increased as a result of the government's revaluation of the dinar, and the reduction of foreign dollar transfers. All these assisted in reducing the demand for foreign currency in the local market and thus helped to boost the demand in the grey market for USD.

This has been found to be the case in 2024, with official exchange rate at IQD1310/USD and black market rate at IQD1515/USD. The gap between the two rates is still there and suggests that the official revaluation failed to remove pressures in the parallel market. It also demonstrates the continued effects of the external limitations on dollar flows, and the internal and formal limitations to access to foreign currency and high dollar demand in the domestic market. The evolutions of the exchange rates of 2023 and 2024 are thus reflective of the official exchange rate's strengthening, without any corroboration from a structural or foreign market constraints perspective.

Table 3. Iraq's Trade Balance 2010

Year	Exports	Imports	trade balance	Coverage percentage
2010	51.764	43.915	7.849	117.87
2011	79.681	74.803	31,878	166.69
2012	94.209	59.006	35.203	159.66
2013	89.769	59.349	30.420	151.26
2014	83.981	53.177	30.804	157.93
2015	51.327	48.009	3.318	106.91
2016	41.298	34.208	7.090	120.73
2017	57.559	38.766	18.793	148.48
2018	86.360	45.736	40.624	188.82
2019	81.585	58.138	23.447	140.33
2020	46.829	48.149	-1.320	97.26
2021	73.045	40.849	32.235	178.85
2022	118,045	55.194	62.851	213.8
2023	99.149	65.826	33.323	150.61
2024	100.990	87.410	13,580	115.54

3.1.7. Iraq's Trade Balance During the Period 2010–2024

As shown in Table 3, Iraq's exports and imports and the trade balance between them and their export coverage ratio in the period 2010 - 2024. The data show that the trade balance of Iraq was positive in almost all the years of the study period, but in 2020, the negative trade balance was the result of the significant decrease in Iraq's oil exports due to the COVID-19 pandemic and the significant decline in oil prices in world markets this year. That year's trade deficit was approximately USD 1.320 billion with export coverage ratio decreasing to 97.26%. This ratio was less than 100% which meant that the value of exports wasn't enough to balance the value of imports.

Between 2010-2014, Iraq always had trade surpluses ranging from USD 7.849 billion to USD 35.203 billion. The positive outcome was believed to be due to a high price of commodities in the country, and to increased income from oil exports, the leading foreign currency earner. During this period, the value of exports started to increase around USD 59.006 billion, as export revenues far exceeded import expenditure, the export coverage ratio was 159.66%.

The trade surplus was discovered to have dropped to approximately USD 3.318 billion, USD 7.090 billion for 2015 and 2016, respectively. The drop was mainly due to the drop in oil prices in the international market as it had a negative effect on the value of Iraqi exports. But Iraq had a trade surplus and the export coverage ratio was greater than 101% which indicated that exports were still in excess of imports. It is noted there was a slight improvement in the trade balance in the years 2017-2019. This surplus rose to USD 40.624 billion in 2018, and dropped to almost USD 23.447 billion in 2019. This was primarily because of the recovery of the oil prices and the export earning surplus over import expenses, worldwide.

COVID-19 proved to be a major economic shock in 2020 to the Iraqi economy. The value of exports was USD 46.829 billion, which fell below the value recorded for the same period last year due to the fall in the demand for oil in the world, and the fall in international prices for oil. Meanwhile, imports were valued at almost USD 48.149 billion. Hence, Iraq went on trade deficit during the study period for the first time. The result shows how sensitive the Iraqi economy and trade is to the global oil market fluctuations. The balance of trade in 2021 started to show positive figures, due to the rise of oil prices and demand on the international market. The surplus level in 2021 was approximately USD 32.235 billion while it increased in a considerable manner to USD 62.851 billion in 2022, which is the highest level in the study period. Meanwhile, during the same year, exports reached about USD 118.851 billion and the ratio of export coverage reached the highest level of 213.8%. This suggests that the value of exports was more than double that of imports.

The trade surplus has decreased to around USD 33.323 billion in 2023 and USD 13.580 billion in 2024. This drop was due to more imports and reduction in export revenues. There was no negative trade balance as a result of this cut and export coverage ratio remained above 100%. This means that the trade surplus has not increased but it is lower than in 2022.

Finally, the figures presented in Table 3 show that Iraq's trade balance is mainly favorable, based on oil exports and, therefore, Iraq's trade is very sensitive to the changes of world oil prices. The study reveals that Iraq did not experience any trade deficit during the period, except for 2020. Strong export activity and higher oil prices in the world contributed to the year 2022 to be the best one in terms of trade. The other way around, however, was responsible for the trade surplus declining during both 2023 and 2024 thanks to a decrease in export and an increase in import values.

This is a reflection of the need for diversity in productive and export base in Iraq and strengthening the industrial base and enhancing the non-oil exports. This will help to decrease the reliance on oil income and contribute towards attaining long-term stability and sustainability of the country's trade balance.

This study is about estimating the Iraq trade balance in the trade value due to the fluctuations of the exchange rate and its effect on the trade balance in the period (January 2000 - December 2022). The ARDL methodology

3.2. requirement: Unit root

Table 4.Test Unit root (individual unit root process)

Null HTBpothesis: Unit root (individual unit root process)			
Series: ER, TB			
Method		Statistic	Prob.**
PP - Fisher Chi-square		2.6755	0.00 00
PP - Choi Z-stat		-0.1 0187	0.000 0
Intermediate Phillips-Perron test results UNTITLED			
Series	Prob.	Bandwidth	Obs
ER	0.0112	2	79
TB	0.0000	2	79

Data source: Data self-developed with the use of the statistical software.

In the above table 4, it is seen that all the variable studied are stationary at level, (I(0)). Therefore, first differences of these variables have to be taken to transform them and the analysis can be performed without transforming them.

3.3. Forecasting the impact of the exchange rate of the trade balance

For The effect of exchange-rate changes on the trade balance was estimated with the use of the autoregressive distributed lag (ARDL) approach. Before employing ARDL methodology it was essential to examine their unit root behavior of the variables of study. It was important to test their unit root property of the study variables before they used ARDL methodology.

If the variables are stationary level (I(0)), stationary after one differencing (I(1)) or stationary level (I(0,1)) then they are suitable variables to be used in ARDL model. But no 2nd order integrated component (I(2)) may be included in the model. Suppose that there is an I(2) variable, then the critical values of the bounds test procedure will be wrong and the result of the procedure will be incorrect in determining whether there is a long run relationship between the variables.

The outcome of all the unit root tests in the unit showed that none of the study variables were integrated of order two. But the need for the ARDL has been satisfied and the model estimated to see the effect of exchange-rate volatilities on the trade balance. The preliminary results of the ARDL estimation are presented in table 5.

The very first estimation of the model is a preliminary estimation.

Table 5. The preliminary results of the estimation of ARDL model

Dependent Variable: D(TB)			
Method: ARDL			
R-squared	0.75646	Mean dependent var	-0.095965
Adjusted R-squared	0.74765	SD dependent var	0.097540
F-statistic	13.66745	Durbin-Watson stat	653268 .2
Prob(F-statistic)	0.000000		
* p-values are incompatible with t-bonds distribution.			

Data Sources: The outcome of the Eviews 13 Software have been prepared by the researcher.

Table 5 shows the results of estimation of the ARDL model. The R^2 value was ~0.74 indicating that the independent variable provided a good explanation for 74% of the variation in the dependent variable. The rest 26% is attributed to other economic factors which were not captured in the model estimated.

The F-statistic calculated was 13.6674 which was statically significant. This suggests the overall importance of the model assumed, and suggests that the explanatory variable does have a significant joint effect on the dependent variable. So, the model is statistically acceptable to analyze the relation of the study variables, it is considered statistically acceptable.

3.4. Cointegration testing according to the ARDL methodology

Autoregressive Distributed Lag (ARDL) model is analysed by using the ARDL bounds-testing approach. This test uses the computed F-statistic which is compared to the lower and upper critical bounds constructed by Pesaran et al. for various levels of statistical significance.

If the computed F statistic is greater than the upper limit then the null hypothesis of no cointegration is rejected and it is concluded that there is a long run relationship between the variables. If it is less than the lower critical bound then the null hypothesis is not rejected. If the result falls in between the lower bound and upper bound, however, the result is inconclusive. The results of the ARDL bounds test are shown in Table 6.

Table 6.The ARDL Bounds Test for Cointegration

Test Statistics		Value
F-statistic		9.767457
I(0)	I(1)	
2.36	3.478	5%

Data Sources: The researcher has found that this has been prepared using the Eviews 13 Software

The results of the ARDL bounds test (as presented in Table 6) shows that there is a "long run cointegration" between the dependent variable and the independent variable; that is, there is a long run relationship between the dependent and independent variable. The calculated value of F is 9.767457 which is higher than the upper critical value of F at 5% significance level I(1) = 3.478. So the null hypothesis (no cointegration) is rejected and there is a stable long run equilibrium relationship between the variables.

The ARDL model was used to calculate the error correction model.

Once the cointegration has been confirmed, the error correction model has been estimated using ARDL approach. The model is composed of two parts: The first part reflects the short run dynamics and how fast the correction of the deviations from the equilibrium is achieved, as shown in Table 7. The second part is an attempt to establish the long run relationship between the exchange rate and the trade balance.

In SR-EC model, there is only one exogenous variable. In an SR-EC model, there is just one exogenous variable.

The methodology of ARDL model was used to develop short run error correction model. The short run error correction model was developed by employing the methodology of ARDL model.

Table 7. Error correction model (short term) according to the ARDL methodology

Dependent Variable: D(TB)				
Method: ARDL				
Selected model: ARDL(1,1)				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.654678	0.025327	-3.557649	0.0000
D(ER)	-0.654768	0.032298	2.309987	0.0007

Data Sources: This is the outcome of the researcher's effort in using the EViews 13 Software.

Estimating the model by the OLS method is done using the LR-SEM.LR-SEM and OLS method are used for the estimation of the model.

To examine the relationship between the exchange rate and the trade balance for Iraq, long run error correction model is estimated for this purpose using ARDL approach with a time period of 2010-2024 as shown in Table 8.

The value and sign of the coefficient of the error correction equation were significant and negative (−0.654678). This result shows that around 65.47% of the disequilibrium between the two variables of the exchange rate and the trade balance is corrected within one year. From the model it can be seen that, the model takes approximately 1.5 years to reach the fully equilibrated long run path, which is: $\left\{\frac{1}{--0.6546785} \cong 1.5\right\}$.

The value of probability for the exchange rate variable was 0.0007 which is non-significant at 5% level. Thus, it is concluded that the null hypothesis, which states that there is no significant effect, is rejected. The estimated coefficient of the exchange rate was −0.654678 which showed that there was a negative and significant relationship between trade balance and exchange rate. In more detail, an increase in the exchange rate will cause the trade balance to decline by about 0.654678 units, with other factors constant.

This is because the balance of trade in Iraq is sensitive to the exchange rate changes and Iraq is a large importer of oil and its exports. Thus, the present equation is estimated as a long-run equation and according to ARDL method, the equation is an "error correction" model.

Table**8. Error correction model (long term) according to the ARDL methodology**

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
ER(-1)	-0.674567	0.657576	0.674584	0.0000
C	0.656378	0.684855	4.786868	0.0000

Description of Data Sources: The researcher has organised the data using the Eviews 13 Software.

The probability value of the t-statistic of the exchange rate variable (ER) was 0.0000, which is less than the 5% significance level. Thus, the null hypothesis is rejected and it can be accepted that there is statistically significant effect of exchange rate on the trade balance (TB) in the short run.

The coefficient of the exchange rate variable was estimated as −0.874567 which was negative. That means that the lower the exchange rate, the more negative the trade balance. That is, for every one percent increase in the exchange rate (ceteris paribus) the trade balance will decline by approximately one percent. This outcome is in line with the Iraqi economy's structure, which means that oil revenue and fluctuations in the economic exchange rate have an important impact on the effect of the trade balance.

Produce the diagnostic tests for ARDL model.

The estimated ARDL model was subjected to a number of diagnostic tests for statistical validity and reliability. The following tests are components of this:

The normality test for the residuals is very similar to the normal probability plot of the residuals.

The probability value corresponding to the Jarque–Bera statistic were used to check the normality of the model residuals. The results of this test are shown in figure 2.

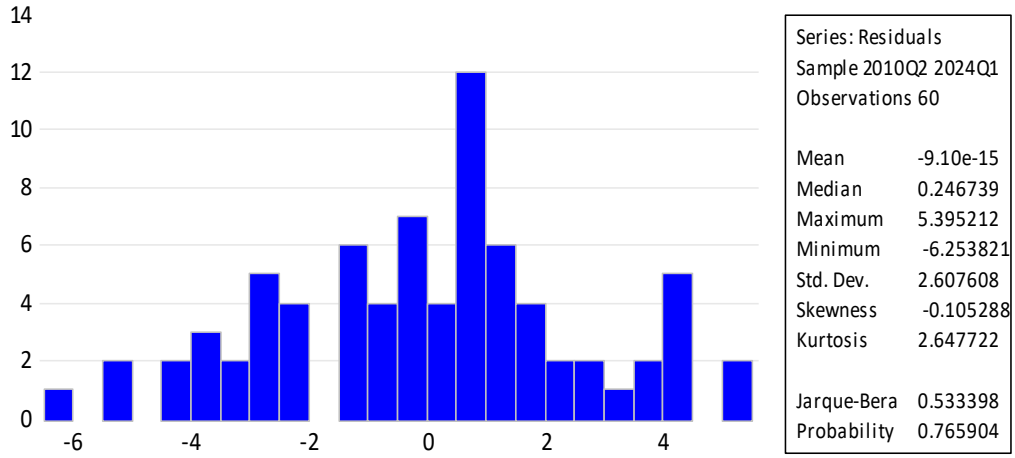


Figure 2. Tests for ARDL model
Data Sources: This is a product of the researcher's work using the EViews 13 Software.

The distribution of the model residuals are almost normal as shown in Figure 2. The results in Figure 2 are used to show that residual of the estimated model is normally distributed. The reported probability value was found to be 0.765904 which is > 0.05. Thus, the assumption of normal distribution of the residuals in the model cannot be rejected. It is claimed to be a good test of the normality assumption.

The next test is used to check for the presence of serial correlation in the model residuals in the ARDL model. The result of the serial correlation test of the residuals using ARDL model is as follows.

Table 9.The ARDL model was tested using serial correlation

Breusch-GodfreTB Serial Correlation LM Test:			
F-statistic	1.998786	Prob. F(2,62)	0.1123
Obs*R-squared	2.45346	Prob. Chi-Square(2)	0.2134

Data Sources: The data used for this has been prepared by the researcher using the Eviews 13 Software.

This survey Chi-square value is 0.7861 which is higher than the significance value of 5% as seen in table 9. So, it can be concluded that null hypothesis (no serial correlation among the model residuals) cannot be rejected and the alternative hypothesis is rejected. This means that there are no time-series issues in the model.

4. Conclusions

The lessons learned from Iraq's experience in the time period 2010-2024 were significant about the relation between the exchange rate and trade balance. The exchange rate would not adjust to shocks when fixed and backed by oil revenues, causing a clear trade deficit when oil revenues decreased. On the other hand, the use of the exchange rate as a tool in 2020 in the form of devaluation of the dinar helped to strengthen the correction of the trade balance to meet the target of achieving a surplus as conditions improved in 20212022. This, however, had a price tag in the form of higher domestic prices, though. The exchange rate is the outcome of economic factors including trade, inflation and interest rates and psychological factors including expectations. Hence,

central banks keep an eye on these and take measures to maintain stability when they are needed and to avoid sudden swings in the market. The economic stability of Iraq needs to be attained by diversifying sources of income and reducing dependence on oil, say international institutions. Continued oil price fluctuations will make the trade balance sensitive to future price shocks and exchange rate policy will be a short-term measure only. Rising and falling movements in Iraq have clearly affected the trade balance but within the framework of the economy's structure. Devaluation of the dinar in 2020 contributed to the improvement of the trade balance through a reduction in imports and an increase in domestic revenues, while the partial revaluation in 2023 was performed with the purpose of other stabilizations. Hence, diversification of production base is required to attain sustainable balance and enhancement of domestic production is required. One of the most important issues for decision makers in achieving internal stability and external balance will be the balance between exchange rate stability and flexibility in its management. In addition, it is recommended to increase the autonomy of the central bank in exchange rate policy and lessen direct government involvement in exchange rate policy. To strengthen studies and research regarding the exchange rate in Iraq, and analyze its impact on the Iraqi economic variables, and its link with the global economy. Defining clear policies to control the inflow and circulation of foreign currencies, diversifying the currency basket and not placing too much weight on the dollar to minimize risks from global market uncertainty. Economic policies that promote the use of local products, and decrease the importation of products, will generate added value to the national currency, lessen consumerism and help to improve the standards of living.

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