ADEQUACY OF INTERNATIONAL RESERVES FOR IRAQ IN LIGHT OF EXTERNAL RESOURCE IMPACT AND INTERNAL STABILITY CONSTRAINT

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Abstract: The research focused on the issue of the adequacy of international reserves in Iraq and the possibility of exploiting the surplus in directions that represent an effective approach to managing reserves according to maneuvering among the basic objectives of maintaining the reserves, which are liquidity, safety and return. The conditions of the Iraqi economy represented by external oil shocks and internal stability restrictions. The research started from a problem related to the ineffectiveness of managing international reserves adequately, based on a hypothesis centered on the possibility of using the surpluses of the international reserves to achieve far-reaching goals and objectives, as well as the traditional goals. And it was found through the research that Iraq manages international reserves in a way that makes it keep reserves that exceed the optimal volumes according to its global indicators, and an estimate of the size of the adequate reserve and the size of the surplus reserve, and the possibilities of investing the surplus reserves in higher air paths were also reached.

Keywords: international reserves, adequate size of reserves, optimal size of reserves, balance of payments, exports and imports, opportunity cost

Introduction

The issue of following up the quantities of official international reserves, which are maintained by central banks, is of great importance, and knowing whether they are within the optimal or adequate size, or less or more than that. This allows the rational use and management of these reserves in achieving their goals with high accuracy without sacrificing high alternative costs if the volumes of these reserves are above the optimal and adequate size. Iraq is working to achieve several goals behind building its international monetary reserves, which it has accumulated due to the new mechanism on which it relied in its work, in accordance with its law that was enacted after 2003. This mechanism lies mainly in the process of selling oil in favor of the Ministry of Finance, and then the latter exchanges the oil dollar for the Iraqi dinar with the Central Bank, for the purpose of aligning with the current public spending and investment in the state's general budget. After that, the central bank accumulates the dollars it obtains and uses it to meet the private sector's demands for dollars, and the remainder goes as an accumulated international reserve. The issue of accumulating large reserves with the Central Bank is a sensitive issue in terms of economic analysis, which always aims to search for the best ways to make the best use of economic assets, and to reduce the opportunity cost resulting from holding them in the form of highly liquid assets, in excess of the optimal and adequate volumes. . Here, the transition of the international reserve management approach, from traditional approaches to effective ones, is of great importance, in order to release reserve surpluses to their optimal uses, and with greater returns, whether directly or indirectly, by supporting the new economic system based on the philosophy of market economy. And the advancement of the private sector, and thus moving forward towards better growth opportunities outside the export of the only oil resource.

Research problem: The research stems from a problematic that the international reserves maintained by the Central Bank of Iraq are managed according to useless formulas and are not based on effective methods, and

what constitutes surplus reserves over adequate reserves of a loss of greater opportunities in supporting the Iraqi national economy as well as the restrictive goals of stability cash and financial. The problematic of the research can be formulated in the form of a question: Is there a possibility to formulate a mechanism to calculate the adequate volume of Iraqi official reserves according to the data of the rentier economy and the use of surpluses in a way that reduces opportunity costs?

Research hypothesis: The research is based on the hypothesis that "relying on a mechanism to calculate the adequate size of the international reserve, and the use of the surplus of the international reserve in investment fields, can lead to a reduction in the opportunity cost of maintaining the surplus, and enhance the possible economic opportunities."

Research Objective: The research aims to achieve several objectives:

1- Introducing international reserves and the mechanisms for calculating optimal and adequate international reserves.

2- Shedding light on the international reserves in the Iraqi economy and the mechanism of their accumulation, and calculating the optimal and adequate size for them.

3- Suggesting a strategy for managing international reserves in Iraq and using the surplus reserves in more productive areas, and moving from the traditional approach to the effective approach in achieving the objectives of the reserves.

Research methodology: The researcher relied on the deductive approach and using the descriptive method of the phenomena, data and literature of international reserves and their analysis, and a set of conclusions and recommendations were reached, which were consistent with the goal of the research and the achievement of its hypothesis.

1.   **The first requirement // Conceptual framework and literary review:**

First: the concept of international reserves:

Economic thought has included many definitions of international reserves in order to weave a firm and clear understanding of them in a manner that secures the correct and successful employment and use. The reason for the multiplicity of definitions is due to the multiplicity of angles of view of the elements that make up it. In general, countries aim to build their international reserves to ensure easy flow of their balance of payments, fulfill their foreign debt obligations in foreign currencies, and find sums in foreign currency to ensure their economies withstand economic and financial crises. In this context, the following set of definitions can be included:

1- Official international reserve assets are money like assets that are held by governments and can also be distinguished by governments as payments that are fully acceptable to each other (Pugel, 2016).

2- International reserves or foreign exchange reserves are external assets owned by the country, which include gold, special drawing rights (SDR), foreign currencies, and bonds owned by central banks and monetary authorities (Kashif, Sridharan, & Thiyagarajan, 2017).

3- International reserves are the foreign assets available and prepared according to the demand of the monetary authorities and at their disposal to finance the balance of payments deficit or to intervene in the foreign exchange market or for other purposes. On this basis, international reserves are not just foreign assets in the possession of the monetary authority. Rather, they must be liquid or marketable and known in a convertible foreign currency. Financial dues, monetary gold, special drawing rights, unconditional drawing rights from the International Monetary Fund). Foreign currency deposits with national institutions are not considered among the reserves, and the debt securities issued by a national authority in foreign currency are also not counted within the reserves because they are not foreign assets according to the residence standard. Foreign assets are liabilities of non-resident parties in the country, and this is the standard (Jarociński & Karadi, 2020).

4- The International Monetary Fund defines international reserves as the external assets available at the disposal of monetary authorities and subject to their control to meet the needs of financing the balance of payments, or to intervene in the exchange markets to influence the currency exchange rate, or other related purposes such as

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maintaining confidence in the local currency and forming a basis It is based on external borrowing (Kashif & Sridharan, 2020).

5- Some economists, such as Professor Heller, believe that international reserves are a collection of liquid foreign assets that are used in settling international payments. Heller decides that the means of international payments must be characterized by two characteristics. At all times and with all economic units to meet financial obligations, the second can be expressed in terms of internationally known external units of account, such as monetary gold, convertible foreign currencies and the gold tranche at the International Monetary Fund (Chohra, 2019).

6- International reserves are the country's stock of foreign assets, which include deposits in foreign currencies, gold, special drawing rights, and bonds, which are kept with the central bank in order to support the exchange rate system in the country (Mansour & Zaki, 2020).

7- The official international reserves are the total of the official foreign reserve assets and other assets in foreign currencies that are either with the central bank or invested abroad (Iliyasu, Sanusi, & Suleiman, 2019). Here, the implicit reference is to the net international reserves, which are the subtraction of short-term foreign obligations from the total reserves, and therefore the international reserve of a country is represented only in those elements that are quickly placed at the disposal of the monetary authority for use directly in the face of the balance of payments deficit.

8- The international reserve is meant as the foreign assets that governments want to keep, because the governments of other countries accept them in settling debts and international transactions, and based on the ability of these assets as tools for settlement in international transactions, the governments of various other countries always seek to create these assets to keep It can be used in periods when an emergency or temporary deficit occurs in its balance of payments so that it is not forced to adopt undesirable basic measures and changes in its economic and social policies.

9- International reserves are surpluses that form an additional financial mass, consisting of international cash, liquid financial assets, special drawing rights, and gold, owned by central banks and managed and managed in coordination with the government (Esmail, 2018).

10- They are balances of gold and foreign currencies that are used by the authorities in the face of the expected fluctuations that may occur in the balance of payments. Or it is the sum of the financial and technical means necessary for financing international trade and settling payments between countries. Or they are resources at the disposal of the monetary authorities in the foreign exchange market, which means the accumulated and stockpiled portion of international assets that the monetary authorities actually hold and can use at any time without restriction or condition (Nurkse, 2019).

Through the definitions that have been presented, it is clear that official international reserves are assets denominated in gold, special drawing rights, or currencies of countries that are convertible and universally acceptable and are in the possession of the monetary authority in the country and can be used directly and without any costs or time in order to settle the balance of payments deficit or Achieving stability in the exchange rates of the national currency. Accordingly, the international reserves are characterized by the following:

1- To be available at any time to the monetary authority.

2- It should be denominated in internationally accepted assets in international settlements.

It seems useful for a deeper understanding to address a set of idiomatic approaches that are close to the official international reserves, which will be addressed in the next paragraph.

2. Second: Approaching concepts to international reserves:

There are several conventions that may be close to international reserves, but they do not take their place or do their work, and that their financial risks and costs make them of low liquidity compared to official international reserves. Among these terms are:

1- International private or unofficial reserves: which are internationally accepted global currencies as well as securities such as long and short-term debt securities, but they are owned by the local private sector and constitute liabilities on foreigners as institutions and countries (Pugel, 2016).

2- International liquidity: as it is a more comprehensive term than international reserves, as it includes assets such as long-term foreign debt securities in addition to the components of international reserves (Abid, Almershedy, & Abdulabbas, 2019). Thus, international liquidity lacks in general the elements of the reserves referred to previously, as they should be available at any time for use in settling the balance of payments and influencing exchange rates. The concept of international liquidity is more comprehensive than the concept of international reserves from three angles: (Aizenman, Cheung, & Qian, 2020):

2-1- The concept of international reserves is based on the balance sheet of the monetary authority, while international liquidity represents the inflows and outflows of foreign currencies resulting from the activities of the monetary authorities inside and outside the balance sheet.

2-2- International reserves refer to the external assets of the monetary authorities, while international liquidity represents the sources of foreign currency and the leakages from those sources to the monetary authorities and the central government.

2-3- The assets of the monetary authorities represent the liabilities of the non-residents, while the international liquidity reflects the foreign currency liabilities of the monetary authorities and the obligations of the residents and non-residents.

3- Sovereign Wealth Funds: Sovereign wealth funds are money that governments do not manage outside the balance sheet of the central bank. Its aim is to be present upon request to the monetary authorities (Balding, 2012).

4- Legal reserve: It is the percentage that commercial banks maintain from their deposits with the Central Bank in order to face unexpected withdrawals by depositors. This legal reserve is used to achieve internal stability, especially inflation, while international reserves are used to achieve internal and external stability by balancing the balance of payments and controlling the exchange rate. Also, the legal reserve is in local and foreign currency, while the international reserve is denominated in an internationally accepted currency (Mishkin, 2007).

3. Third: Types and components of international reserves:

1- Types of international reserves: where there is a group of assets that approach or move away from the misleading international reserves by a thin thread, and they are:

1-1- Owned reserves and borrowed reserves: As the owned reserves are those international reserve assets that are in the possession of the country, i.e. absolute ownership by the monetary authority, and therefore it can dispose of it completely freely as it wants and according to its own circumstances, the gold in the vaults of the Central Bank The size of the golden position of the country in the International Monetary Fund, as well as the foreign currencies held by the countries, and the units of special drawing rights. Calculating the international reserves of any country on the basis of the size of these assets to its total international assets is one of the best measures because it shows the extent of the country's own ability to meet its external obligations. As for the borrowed reserves, they represent the group of assets that the state obtains through external borrowing, and they are used in settling the balance of payments, but here the economy bears a burden on those assets represented in the payment of the installments and interests arising from them (Dominguez, Hashimoto, & Ito, 2012).

1-2- Investmentable reserves and non-income reserves: The former is the part that consists of hard currencies, gold and special drawing rights. As for the second, it includes the state's position with the International Monetary Fund (the reserve tranche).

1-3- Ordinary reserves and net reserves: the first does not take into account the external obligations, while the second excludes external obligations, and the second reserves are the best because they measure the real liquidity position of the country)Dominguez et al., 2012(.

2- Components of international reserves: Official reserve assets usually consist of monetary gold, the central currencies of large economies, special drawing rights, and the cash reserve tranche of the International Monetary Fund, and the following is an explanation of each of them:

2-1- Monetary gold, which is one of the basic elements of international reserves, and was used as a means of monetary exchange and settling international payments for the period 1870-1914, and despite all the international changes that affected gold, especially after August 15, 1971 and the removal of its official price after the United States stopped transferring Dollars were converted to gold and removed from the international monetary system, but it remained with its characteristics and importance as one of the components of international reserves, as it enjoys international acceptance as an asset for settling debts and international payments (Talahite & Beji, 2013). The reasons and justifications for central banks' retention of gold lie in several considerations, including diversification in reserves and achieving economic security, physical security resulting from the value of gold in its origin, not from legal considerations, insurance against future risks, its high confidence, and the possibility of

using it as a source of income through investing in the market the gold exchange or gold lending (Bhatia, Dempster, & Milling-Stanley, 2011).

2-2- Foreign Reserve currencies. Foreign pivot currencies are the second component of international reserves. For a time, gold was the main component of international foreign reserves, but after the collapse of the gold base system and the establishment of the Bretton Woods Agreement, the status of gold declined and foreign currencies began, headed by the US dollar. To occupy an important place among foreign currencies in the formation of international reserves (Rodrik, 2006). Among the basic conditions that must be met by foreign currencies in order for them to become acceptable pivot currencies in settling international payments are (Brutger & Clark, 2021):

2-2-1- This currency must belong to a country or an economic bloc that has a great place in global trade so that other countries can obtain this currency through normal trade exchange relations, and this also means that this currency must have a market Globally, the supply and demand for this currency are available.

2-2-2- The value of this currency enjoys a large degree of stability, or at least a greater degree of stability enjoyed by the currencies of other countries, that is, it has a comparative advantage in preserving its value compared to other international currencies.

2-2-3- This currency should be based in its home country on a monetary and banking system and financial markets with a great degree of progress and experience in its institutions, and high efficiency in its management methods.

2-2-4- This currency should not be subject to periodic scarcity, which means that the balance of payments of the country to which it belongs, should be characterized by basic structural characteristics so that this scarcity does not occur. In the sense that if there is a surplus in the balance, it should be matched by an exit for investments in order to flow abroad, but in periods of deficit in the balance, the state should not take deflationary measures that make its currency scarce in international exchange.

The central currencies today, which constitute an international reserve for most countries of the world, consist of the US dollar, the European euro, the Japanese yen, the British pound, and the French franc, in addition to some other currencies.

2-3- Special Drawing Rights (SDR), are international reserve assets established by the International Monetary Fund to supplement the needs of the member states of the Fund as a result of the scarcity of gold. Special drawing rights are allocated in proportion to the shares of all member states of the Fund. It was created in 1969 and thus represents a new type of international reserves in addition to gold and central currencies. The Special Drawing Rights are considered as paper gold and came as an alternative to the scarcity of gold, as they are not considered real money in the sense that they do not have a physical entity, but rather they are book entries made by the Fund among the participating members, and they are evaluated on the basis of a basket of central currencies (Schanz, 2019).

2-4- The cash reserve tranche or the golden position, which is when a member state purchases a currency from the International Monetary Fund without this leading to an increase in the currency of the member state's currency in the fund's possession beyond the level of its share in the fund. Subscription takes place in The reserve tranche is in currencies acceptable to the fund or in special drawing rights. According to this segment, the member can borrow it to meet his request within the limits of its percentage. In this way, the limits of withdrawal from the tranche depend on the member state's share in the fund, and it is permissible to withdraw only in the case of settling the balance of payments with a temporary deficit, and it is not permissible to use the tranche for long-term investments or to finance large movements of capital, or to confront structural imbalances in the balance of payments or to repay debts (Bacchetta, Benhima, & Kalantzis, 2013).

4. Fourth: Determinants and Motives of International Reserves:

1- Determinants of demand for international reserves:

The economic size, expressed in terms of GDP per capita and population, is one of the factors that explain the change in reserves over time. Also, reserves are directly proportional to commercial growth, and this is supported by many follow-ups. Also, financial openness makes the country more vulnerable to international crises, and thus the need for reserves is greater, and the opportunity cost of reserves is one of the important determinants in this aspect. On a related level, the flexibility of the exchange rate reduces the need for reserves, regardless of the announced system of the exchange rate, where real flexibility plays a prominent role in that. Whereas, many countries that have declared their commitment to floating or managed flotation have shown, in fact, a tendency to stability, which means the need for larger reserves (Bahmani-Oskooee & Brown, 2002).

The demand for international reserves also varies according to the type of country and the type of economic system. In developed countries, their interest in forming reserves is less due to the strength and flexibility of their production apparatus, and the majority of developed countries enjoy the fact that their currency is hard currency, or as we called them the base currencies, and these countries often depend on the flexible exchange rate approach, which makes them indispensable to form Huge reserves for intervention in the foreign exchange market, and these countries consider foreign exchange intervention as a kind of distortion of international competition in the commercial and financial aspects, which is inconsistent with the principles of economic liberalization. As for the developing countries, they need more to form reserves, as they use them to control foreign exchange rates and avoid major changes in it, which have a negative impact on their economies, and the majority of developing countries suffer from structural imbalances and economic problems that make them need reserves to face Deficits in their balance of payments for the oil and non-oil countries, in this aspect the demand for reserves varies from different points of view, as the petroleum countries are the most capable of forming huge reserves, and these countries need these reserves badly in order to face the uncertain conditions in the market Petroleum. Concerning the type of economic system, the more the economic policies emanating from socialist systems, the greater the desire of the state to increase the rate of its monetary reserve. As for the more free or decentralized countries, they are less interested in forming reserves because they have little interference in their economic indicators (Jeanne & Ranciere, 2011).

2- Motives for holding international reserves:

There is a set of motives that call for countries to maintain and build international reserves, which are:

2-1- It is used as part of the monetary cover of the local currency, whether it is in the form of leading currencies or gold.

2-2- Reserves are considered the mainstay in building and stabilizing the external value of the national currency and defending it at highly stable prices, and balancing between the nominal and real exchange rates.

2-3- Increasing the ability of countries to face and withstand shocks that may arise in the international financial markets, or within the local financial system.

2-4- Enhancing financial stability through countries seeking to increase these reserves during the years that are characterized by high export returns, and then the possibility of using them in subsequent years in which the terms of trade exchange are disrupted (PHAM & DOAN, 2020).

2-5- Maintaining reserves to avoid capital account deficits, large movements of short-term debts, and a decrease in the opportunity cost of reserves, as well as to overcome the crises resulting from the increase in the tendency to import (Bulut, Ucler, Aksoz-Yilmaz, & Basaran, 2022).

2-6- Providing a high assessment of the country's sovereign creditworthiness, because investors monitor the creditworthiness of different countries, which means that the level of interest rates on loans for the country in question in the international market is affected, in addition to the movement of capital incoming to it (Adrian & Shin, 2010).

5. **Fifth: Sources of accumulation of international reserves:**

The balance of payments is the main source for the accumulation of international reserves in any country, as the surplus achieved in the current, financial and capital accounts, in the balance of payments, is the main source of this accumulation. These surpluses can be shown in these two accounts according to the following:

1- The current account, there are some economies that achieve a surplus in the current account, which arises mainly from the surplus achieved in the trade balance, whether it stems from the rentier nature of the economy, especially oil rent, or because of the strength of that economy and the resulting high export potential based on its capabilities. competitiveness. Workers' remittances, grants, aid and service income are additional sources for the accumulation of international reserves within the current account of the balance of payments.

2- The capital and financial account, other economies achieve a surplus in the capital and financial account, and thus this account is an important source of reserve accumulation. International reserves are created in this case through the flow of foreign loans or due to the influx of foreign investments looking for higher interest rates at the international level, or those funds looking for investment in areas of quick profit and speculation in the financial and foreign exchange markets, and this is what happens in Countries that are characterized by economic openness and which depend on managed exchange systems (Aizenman et al., 2020).

The flow of foreign loans and capital looking for interest rates differentials and quick profits may have a positive impact on international reserves in the short term, but in the medium and long term, and when the time comes for repayment and the return of these funds to their home countries, they will have a negative impact on

international reserves. It should be noted that international reserves may not be limited to one account without another in the balance of payments, as sometimes some economies achieve a surplus in both the current, capital and financial accounts, and thus both are important sources of accumulation of reserves (Aizenman et al., 2020). The balance of payments account surpluses that make up the reserves can be shown through the following simplified equations (Céspedes & Chang, 2020):

$IR=SCA+[SKA+SFA]$

$IR=Forex+Nonc$

$Forex=St+D\&C$

$Nonc=MG+SDR+GP$

$\Delta IR=\Delta Forex+\Delta Nonc$

Where: (IR) International reserves

[SKA+SFA] Financial and capital accounts surplus

(SCA) Current Account Surplus

(Forex) foreign currency reserves

Non-foreign currency reserves (Nonc)

(St) Securities

(D&C) Currencies and deposits

(MG) Monetary Gold

(SDR) Special Drawing Rights

(GP) IMF unconditional gold Position

The second requirement // Literary review of indicators of the optimal size of international reserves and their management:

First: Indicators of the optimal size of international reserves:

There is a constant debate among specialists about the basic criteria or indicators in the light of which the optimal size of international reserves is determined, as there are multiple views stemming from the nature of different economies, and the vision about the best alternatives or images for maintaining reserves. The absence of a single international body specialized in issuing international liquidity and monitoring its developments leads to the same problem (Obstfeld, 2013). In this regard, there is a set of indicators used by the monetary authorities to determine the appropriate level of international reserves, but there is no, as was indicated, a single and accurate measure that is considered an accurate and universal measure of the optimization of reserves. Each of these indicators is used in light of specific goals and objectives that show the purpose of using the respective indicator. Usually, the discussion about the adequate or optimal size of international reserves includes two main elements, the first relates to determining the correct use of the reserves, and the second includes determining the minimum amount of reserves required to meet specific needs (Obstfeld, 2013). In this way, a set of specific indicators for the optimal size of the international reserve will be presented:

1- Reserves coverage ratio to imports:

This indicator was proposed by (Triffin) in 1947 as a measure of the extent of the optimization of international reserves. Supporters of this indicator see that imports are the most important variable in the balance of payments, due to its close relationship to the level of domestic consumption and economic growth. According to this indicator, the safe level of reserves is the extent of their capabilities to cover the external obligations due during a specified period, especially within 3-4 months of imports, or 30% of the value of imports annually. Supporters of the index believe that resorting to the use of international reserves in case of emergency guarantees the country obtaining its basic imports if that percentage exceeds the limits of the index, as it reflects the country's ability to settle external obligations. But if the ratio is below the indicator limits, it causes a state of economic suffocation, which makes it difficult to import foodstuffs and necessary commodities in emergency situations. In view of the economic conditions that prevail in the developing countries that are heavily indebted, some have recommended that the percentage in the index be raised to (40%) or coverage for a longer period to the limits of (5) months (Stiglitz & Rashid, 2020).

2- The ratio of reserves to money supply in the broad sense M2:

This indicator is one of the early warning indicators of the occurrence of financial crises, and it is also possible to know the degree of capital flight that may put pressure on international reserves, the degree of confidence in the local currency, and the efficiency of the banking system. The degree of importance of this indicator increases in cases of lack of confidence and stability in the state's financial system (de Beaufort Wijnholds & Kapteyn, 2001). The acceptable percentage for this indicator ranges between (5-20%), where the ratio is (10-20%) for

countries that depend on the fixed exchange rate system, and (5-10%) for countries that depend on the floating exchange rate system (Delatte & Fouquau, 2011).

3- The ratio of reserves to the balance of payments deficit:

It was proposed by Brown in 1965. This indicator aims to hedge and face the possibilities of emergency deficit in the balance of payments, where reserves are considered as a balance to face the deficit. According to this indicator, the reserves must change at the same rates as the expected change in the balance of payments deficit. If the deficit curve tends to increase, then the reserves must grow increasingly (Obstfeld, Shambaugh, & Taylor, 2009).

4- Ratio of reserves to short-term external debt:

This indicator is also known as the (Greenspan-Guidoti rule) in reference to the former governor of the Reserve Bank and former Deputy Minister of Finance of Argentina. This indicator depends on calculating the ratio of international reserves to the country's short-term foreign debt (which has a duration of one year or less). This indicator reflects the country's ability to service its external debt in the short term. This indicator assumes that the optimum level of international reserves in any country should cover short-term external debts at a rate ranging between (80-100%). On this basis, a low percentage of this indicator will make the economy more vulnerable to external shocks due to the limited availability of foreign exchange, and also indicates that macroeconomic policies will be unwise, in addition to that economic crises will be more severe if this percentage is low (Calafell & Del Bosque, 2002).

5- Heller Index:

Robert Heller proposed in 1966 a measure through which he tried to determine the ratio of actually achieved reserves to the optimal level of reserves, by comparing the costs resulting from not keeping reserves, which are represented in the adjustment or adaptation measures that the economy bears in the event of not keeping reserves, and the opportunity cost The alternative Opportunity Cost for maintaining the reserves, which is represented in the lost income as a result of not investing these reserves, and the optimal level of the reserves is determined according to the following equation:

$$Ropt = h \frac{\log (r.m)}{\log \ 0.5}$$

Where: (Ropt) the optimum level of international reserves.

(h) The change that occurs in the level of international reserves.

(m) marginal propensity to import.

(r) The opportunity cost of holding reserves.

(0.5) The possibility of a deficit in the balance of payments.

According to the results of this equation, the optimal level of reserves is achieved when Ropt = 1, while if the value of Ropt is less than one, this means that there is a deficit in international reserves (Kasman & Ayhan, 2008).

6- The ratio of reserves to total external debt:

This indicator assumes that the optimal reserve ratio in any country should be equivalent to (40%) of the total external debt, and this indicator is used to determine the state's ability to pay the burdens of external debt.

7- Ratio of reserves to indirect foreign investment:

This indicator aims to confront unexpected external flows through capital flight. This indicator assumes that the optimal reserves ratio should cover (30%) of indirect foreign investments (Obstfeld, Shambaugh, & Taylor, 2010).

8- The ratio of reserves to gross domestic product (GDP):

According to this indicator, the proportion of reserves should be (10%) of the gross domestic product of any country. Others also suggest that this percentage should not be less than (10-20%) in the developed countries, and for the developing countries, the proposed ratio is between (20-40%), which is needed to achieve internal stability and absorb external shocks (Samaratunga & Perera, 2015).

9- Agarwal Index:

In 1971, J.P. Agarwal tried to formulate a scale for estimating the optimal size of international reserves by applying to seven Asian countries. In building the model, he was keen to take into account the structural and institutional differences that exist between the group of developed industrial countries and the group of developing countries. Agarwal has indicated three elements that must be taken into account when estimating the optimal size of international reserves:

9-1- The opportunity cost of maintaining reserves.

9-2- The cost of adjustment policies to face an emergency deficit in the balance of payments.

9-3-Possibilities of using reserves.

Agarwal attributes the reason why developing countries maintain international reserves to financing the emergency deficit in the balance of payments as a result of an unexpected shortfall in export earnings, or an emergency increase in import prices. He also believes that the optimal size of international reserves is the one at which the cost of maintaining reserves equals the benefit of keeping them. And Aggarwal formulated the equation of the optimal size of international reserves according to the following (Cheng & Zhu, 2020):

$$Ropt = W \frac{[\log(k) + \log(Q2) - \log(Q1)]}{\log(p)}$$

Where: (W) the size of the trade balance deficit.

(K) The reciprocal of the capital-output ratio.

(Q1) Ratio of imported capital goods to total capital goods.

(Q2) Ratio of imported goods to output.

(P) The probability of a deficit in the balance of payments.

10. Herbert Grubel Analysis:

Grubel in 1977 used the tools of marginal analysis in his analysis to determine the optimum size of international reserves, as it was based on the law of diminishing returns, and equating the marginal return achieved from maintaining international reserves with the marginal cost of maintaining them (Grubel & Walker, 2019).

It is clear from the above that there are many indicators that measure the optimal level of international reserves to be maintained, depending on the needs and circumstances of each country in terms of the goal of maintaining the value of the local currency or strengthening the capacity of the banking system, international solvency and the ability to repay short-term debts and achieve a safe level of balance Imports during a certain period and adjustments for balance of payments deficits.

6. Second: Managing International Reserves:

What is meant by managing international reserves is the formulas and methods used to control foreign assets owned by the public sector in a manner that ensures that these assets are available for use at any time, while ensuring that a return on funds destined for investment in the rest of the various assets is obtained. The management of reserves is also defined as the financial margin obtained from the investment operations of various foreign assets owned by the public sector in order to achieve long or medium-term economic or political goals, while ensuring their recovery in the face of critical or difficult cases of the internal economy and working to protect them from all economic risks or the decrease in Its financial value (Aizenman & Jinjarak, 2019).

The objectives of managing international reserves emerge through maximizing the return achieved by investing them in low-risk financial instruments characterized by a high degree of liquidity and security, supporting confidence in cash and exchange rate management, and limiting exposure to adverse external conditions to absorb shocks in times of crisis (Aizenman & Hutchison, 2012).

The management of international reserves varies according to different circumstances and takes many forms, including:

1- Changing the weights of the objectives of reserves management according to the size of the reserves, where the first tranche can invest in tools such as overnight investment (i.e. a one-day deposit) to ensure complete liquidity, followed by tranches that invest in short-term treasury bills or deposits with close terms. Thus, the investment time periods increase with the assets exceeding the necessary amount in a period not exceeding one year, depending on the characteristics of the economy concerned and the possible extents of the deficit in the balance of payments. As it is customary to divide international reserves into segments or segments called liquidity and investment segments, they are invested according to the return and sacrifice the objectives of liquidity and safety (Banerjee & Hofmann, 2020).

2- Classifying reserves in vertical volume categories, and these categories are subject to follow-up from several aspects, such as evaluating the creditworthiness of countries and banks, following up on their changes, managing risks, recalculating the market value of assets, and arrangements for transferring them across different investment tools and places. Central banks varied in their management of reserves, some of them relied on external expertise in contracting with specialized offices, and others employed external experts within their internal administrative

structure, and some of them were satisfied with contracts with their correspondents in the central banks of the reserve currency countries.

3- Using the Numeraire method in financial investment curricula and managing the international reserves portfolio, which leads to a set of decisions. Here the reference basis varies according to the most important work in the face of obligations or the development of wealth. In other cases, the purchasing power of goods and services may be the approved measure, and for this it is better to adopt foreign trade currencies as a basis for the distribution of reserves. The measurement of reserves in the national currency is also required because it is approved in the balance sheets of central banks, and the disclosure of income, profits and capital losses entail consequences determined by law, including the mutual obligations between the central bank and the state's general budget. This basis makes changes in the exchange rate of crucial importance to determine the financial positions of central banks, which are inversely related to the exchange rate of the national currency (Watambwa, 2021).

The third requirement: analysis of the adequacy of international reserves in the Iraqi economy:

First: The reality of the Iraqi economy:

The Iraqi economy is primarily a rentier economy, as the crude oil produced and exported abroad constitutes the largest proportion of its gross domestic product, its general budget and its balance of payments. In this way, the source of Iraq's international reserve is formed from what it obtains from foreign currencies, especially the US dollar, through its crude oil exports to the countries of the world. The following table shows some important indicators of the Iraqi economy:

Table (1)

The rentier indicators of the Iraqi economy (million dollars)

Years	Gross domestic product	total exports (fob)	oil exports	Ratio of total exports to GDP*	Ratio of oil exports to total exports*	total public revenue	Ratio of oil exports to total public revenues*
2000	20969	18150	18150	0.87	1.0	-	-
2005	36243	29343	24058	0.81	0.81	-	-
2010	117138	51764	54248	0.45	1.04	59981	0.90
2015	157015	51338	43047	0.33	0.83	59766	0.72
2016	157839	41298	28095	0.27	0.68	46395	0.60
2017	175683	57559	46513	0.33	0.80	65390	0.71
2018	199134	86360	72924	0.43	0.84	90084	0.80
2019	216727	81585	78527	0.40	0.96	91004	0.86
2020	154592	46829	41756	0.30	0.89	52448	0.79

Reference: Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

*Calculated by the researcher.

From Table (1) we note that the Iraqi gross domestic product was in the year 2000 (20969) million dollars, then reached its maximum in 2018 to reach (199,134) million dollars, after that it decreased in the years 2019 and 2020 to (216727) and (154592)) million dollars in a row, due to the repercussions of the Corona pandemic, which led to a decrease in demand for oil, which caused a significant decrease in its international prices, and this appears clearly, which decreased from (81,585) million dollars in 2019 to 46829 million dollars in 2020. It is also noted from the table the extent to which the gross domestic product depends on the oil commodity. Where the ratio of total exports to gross domestic product is GDP, except in some years synonymous with crises that reduced exports. As we find that the total exports to GDP were (0.87%) in the year 2000 and then decreased during the period of occupation of Iraq in 2003 and the subsequent repercussions, where the percentage reached 0.81% in 2005. The percentage reached its lowest threshold in 2016 (0.27%) due to the repercussions of the bad security conditions. Then it started rising to (0.43%) in 2018 and (0.30%) in 2020. Oil exports constitute the largest proportion of the total Iraqi exports, which indicates a clear indication that Iraq's first dependence in obtaining hard currencies, especially the US dollar, is through the oil commodity and its export. The proportion of oil exports to total exports ranged from the lowest in 2016 at (0.68%) to the highest in 2019 by (0.96%). The same applies to the contribution of oil to total public revenues, which ranged between (0.60%) at the lowest in 2016, and the highest at 0.90% in 2010, and reached 0.86% in 2019. In this way, for the link between the economy and oil in the international market, the official reserves are volatile based on the conditions of the international oil market, whether they are related to the supply side or the demand side, in addition to the aspects within the Iraqi economy that include the necessary expenditures for the government, which it cannot delay in any case, which is The fixed costs of salaries and wages, as well as maintaining the stability of the Iraqi dinar exchange rates through the stabilization system

followed. This, of course, stems from the weakness of most of the industrial and agricultural sectors, which made the oil sector the only sector leading the growth process, and the generator of the foreign currency on which the Iraqi dinar is based (Natali, 2010).

2- The accumulation and management of international reserves:

It has been shown from the nature of the Iraqi economy that the source of the accumulation of its international official reserves is through the sale of crude oil in the first place, and the issue of the accumulation and management of reserves can be addressed in two aspects:

2-1- Managing international reserves before the occupation of Iraq in 2003:

The Central Bank of Iraq and its monetary policy, and under its law (which was repealed) No. 64 of 1976, was not an active element in managing Iraq's foreign reserves in a manner that serves the required economic stability and defending the foreign currency rate. Also, his policy lacked adequate capacity to manage and face domestic liquidity pressures, especially pressures of demand for foreign currency to finance foreign trade. As Iraq's foreign exchange resources, which come through the proceeds of selling oil, are recorded in the foreign reserve account of the Central Bank, in return for this, the equivalent is recorded in Iraqi dinars in the account of the Ministry of Finance opened with the Central Bank (Zayer, 2019). But what happens after that is that the financial policy can use the foreign currency as a means of payment for the government's external obligations, which was used as a cover for the issued currency, which means that the assets of the Central Bank are used twice, and this violates the balance equation between the assets and liabilities of the bank, which led to the gradual depletion of reserves (Zayer, 2019).

In the same context, the rapid replacement of local debt instruments (treasury transfers) in place of the foreign currency, which was carried out by the government at the time, and the issuance of its equivalent in the Iraqi currency when the Iraqi dinar is exhausted, and thus the matter worsened whenever (treasury transfers) replaced the foreign currency to finance the budget deficit The public through the new cash issuance, which does not have a real cover from the foreign reserve and the actual production, and this process continued for more than two decades, which was reflected in the deterioration of the value of the Iraqi dinar and the low exchange rate. The hyperinflation has increased to terrifying levels, and the standard of living has deteriorated with it (Cooney, 2007).

2-2- Managing international reserves after the change of the political system in 2003:

This stage started since 2004 when the new Central Bank Law No. (56) was issued, whereby government revenues from foreign currency became independent of the reserves of the Central Bank of Iraq. Consistent with the function of the central bank as the government's bank, the government's foreign currency revenues, which are direct revenue to the general budget, are now recorded within items outside the central bank's balance sheet (Alfaiza, Abed, Sultan, & Riyadh, 2021; Ashoora & Ismaelb, 2020). Article (4) of the new Central Bank of Iraq Law stipulates that the formulation and implementation of monetary policy in Iraq, in order to achieve economic stability, is one of the exclusive tasks of the Central Bank, as well as the acquisition and management of international reserves, which have strategic objectives of concern to the country's higher interest. 52). In this stage, the reserve is created through two aspects:

2-2-1- The Ministry of Finance obtains oil revenues in foreign currency, and uses part of these revenues to settle its obligations towards abroad directly in foreign currency. As for the internal obligations, this requires converting the dollars in its possession into a local currency (the dinar) with the Central Bank at an agreed exchange rate. That is, there is an exchange process between items within the balance sheet of the central bank, with items outside the balance sheet, that is, with the general budget of the government.

2-2-2- through transfers of individuals residing abroad to those residing at home, and this aspect is a weak and indirect tool in the formation of the Iraqi international reserves (Ashoora & Ismaelb, 2020; Riyadh, Alfaiza, & Sultan, 2019). The process of exchanging the dollars in the possession of the Ministry of Finance into Iraqi dinars leads to several results. The first is that the Ministry of Finance uses the Iraqi dinar, which it exchanged for dollars, to finance its current and investment spending through its general budget, and a percentage of it goes to the Development Fund for Iraq as well. Second, the Central Bank meets the demand of the private sector and individuals to obtain hard currency to finance imports of goods and services through the foreign currency sale window, which was created in conjunction with the independence of the Central Bank and the issuance of its new law in 2004, and the rest of the foreign currency goes as an international reserve that accumulates with the Central Bank from year to year (Ashoora & Ismaelb, 2020; Riyadh, Sultan, Abdurahim, & Sofyani, 2020).

Second: Calculating the indicators of international reserves in Iraq:

Here, the most important indicators of the optimal size of international reserves and the most widely traded globally will be addressed to express the volumes of international reserves necessary to perform their functions in achieving monetary, financial and economic stability(Sultan, Alfaiza, & Riyadh, 2021).

1- International reserves coverage ratio for merchandise imports:

It is possible to rely on the data of Table (2) to determine the coverage ratio of the reserves during a set of years.

Table (2)

Covering the international reserves of commodity imports in Iraq

Years	International reserves (millions of dollars)	Total CIF Merchandise Imports (Million Dollars)	Import coverage ratio (month)	
			*	**
2005	11918	22002	-	5.0
2010	50357	43915	16.2	11.4
2015	50881	47467	19.0	10.7
2016	42802	34208	17.7	12.5
2017	49399	37866	18.4	13.0
2018	64722	45736	20.0	14.0
2019	68020	58138	16.5	11.6
2020	57897	48150	17.0	12.0

Reference: Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

* Arab Monetary Fund estimates.

** Calculated by the researcher by dividing international reserves by commodity imports.

From the observation of Table (2), it is clear that the international reserves ranged between (11918) million dollars in 2005 and (68,020) million dollars in 2019 during the period shown from 2005 to 2020, which is the period that followed the political change in 2003 and the easing of the economic blockade crisis that was imposed On Iraq by the United Nations in 1991. As for merchandise imports, they increased during the period from (22002) million dollars to (48,150) million dollars in 2020. Whereas, the coverage ratios of international reserves of imports in months ranged from (5) months in 2005 to (12) months in 2020, and reached the highest in 2017 at (13) months. While the estimates of the Arab Monetary Fund differed slightly from the estimates that were calculated by the researcher, as they ranged from (16.2) months in 2010 to (20) months in 2016, while in 2020 it reached (17) months. Whatever the ratios of international reserves coverage of commodity imports, they seem very high and exceed the estimates needed for the optimal volume globally, which range between (3-5) months in most cases, which means that Iraq maintains international reserves much higher than the global levels needed to cover the due external obligations. The performance of the necessary imported merchandise imports(Sultan & Noor, 2017).

2- Ratio of international reserves to GDP:

Where this ratio constitutes an important indicator for achieving internal stability and absorbing external shocks, and the following table (3) shows these ratios.

Table (3)

Ratios of international reserves to GDP in Iraq (millions of dollars)

Years	international reserves	Gross domestic product	Ratio of international reserves to GDP (percentages) *
2005	11918	36243	32.8
2010	50357	117138	42.9
2015	50881	157015	32.4
2016	42802	157839	27.1
2017	49399	157683	28.1
2018	64722	199134	32.5
2019	68020	216727	31.3
2020	57897	154592	37.4

Reference: Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

*Calculated by the researcher.

From the table (3) above, it is clear that the ratios of international reserves to the gross domestic product in Iraq ranged between (32.8%) in 2005 and (37.4%) in 2020, while it reached a maximum of (42.9%) in 2010. It appears from the shown rates that they exceed their global rates, which require them to be between (10-20%), and they are among the rates proposed for developing countries, which are between (20-40%). It should be noted that the percentages shown in the table that pertain to the country of Iraq may be large during the period of stability in oil prices, which means that Iraq bears a high opportunity cost on these large percentages during periods of recovery and stability of world oil prices(Sultan, Noor, & Nasirun, 2018).

3- Change in reserves to change in balance of payments:

International reserves are an important asset that the state can rely on to meet emergency deficits in its balance of payments, and the following table (4) shows the relationship between international reserves and the balance of payments account in Iraq:

Table (4)

International reserves and net balance of payments in Iraq (million dollars)

Years	international reserves	*Annual rate of change %	net balance of payments	*Annual rate of change %
2005	11918	-	-	-
2010	50357	322.5	6266	-
2015	50881	1	14066	124.4
2016	42802	-15.8	8344	-40.6
2017	49399	15.4	2701	-67.6
2018	64722	31	6596	144.2
2019	68020	5	8725	32.2
2020	57897	-14.8	8272	-5.1

Reference: Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

*Calculated by the researcher.

From the table (4) above, we note that the Iraqi balance of payments has surpluses during the period 2010-2020, and this is of course caused by the surpluses in the current account of the Iraqi balance of payments resulting from the export of its only commodity, which is crude oil, and this of course constitutes a serious structural defect. We also note with regard to the relationship between international reserves and balance of payments values, that the annual rates of change of international reserves varied greatly from year to year, as it was (1%) during the period 2010-2015, then it became -15.8% in 2016 and then reached It reached its peak (31%) in 2018, then the rate of change continued to decline to (14.8) in 2020. The rate of change in the balance of payments ranged between (67.6%) as the lowest percentage and (144.2%) as the highest percentage. It appears that the data of the annual rates of change of international reserves and the balance of payments are changing with large and unorganized variations, but it is noticeable that changes in international reserves are directly in line with changes in the balance of payments surplus during the mentioned period. Also, the reserves figures seem very large compared to the net balance of payments, which gives the reserves great strength in the face of emergency deficits that may occur in the balance of payments.

4- Ratio of international reserves to money supply in the broad sense M2:

This indicator reflects the ability of the international reserves held to give confidence in the local currency and stabilize the banking system and its efficiency. It is also an indicator of early warning of the occurrence of financial crises and the degree of capital flight. The relationship of international reserves to the broad money supply can be shown in the following table (5):

Table (5)

The ratio of international reserves to the broad money supply M2 in Iraq

years	international reserves IR(Million Dollars)	Money supply in the broad sense M2 (billions of dinars)	Dollar exchange rate (dinars per dollar	M2 *	$\frac{IR}{M2}$*
2005	11918	14684	1469	9996	119.2

2010	50357	60386	1170	51612	97.5
2015	50881	82595	1190	69408	73.3
2016	42802	88082	1190	74018	57.8
2017	49399	89441	1190	75161	65.7
2018	64722	95391	1190	80161	80.7
2019	68020	103441	1190	86925	78.2
2020	57897	119906	1190	100761	57.4

Reference: 1- Central Bank of Iraq, Annual Statistical Bulletin, miscellaneous annual numbers.

2- Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

* Calculated by the researcher, and the M2 money supply values were converted from the Iraqi dinar to the US dollar, depending on the official exchange rates for the average months of each year.

From Table (5) it is clear that the money supply in the broad sense in Iraq, whose values have been converted from Iraqi dinars to dollars in order to facilitate comparisons and calculation, which includes currency in circulation and current deposits in addition to other deposits, has increased from (9996) million dollars In 2005, it reached (10,0761) million dollars in 2020, and this is, of course, a result of the economic openness and the development that took place in the export and consumption sector, and what these developments require of local liquidity that matches it. With regard to the relationship between the M2 money supply with international reserves and their optimization, we find from Table (5) that the ratios of international reserves to M2 varied during the indicated period, as the ratio was (119.2%) in 2005, while in 2010 the ratio was (97.5%), then it became (73.3%) in 2015, then decreased to (57.8%) in 2016, then increased during the years 2017 and 2018 to (65.7%) and (80.7%), respectively. While the percentage was (57.4%) in 2020. It is clear from the ratios, that they are above the internationally accepted rates for countries that adopt a fixed exchange rate system, which are within the limits of (10-20%) of M2, which means that Iraq maintains reserves that exceed the accepted global ratios, and it constitutes a loss of investment opportunities for these reserves in other areas and the high cost her opportunity.

Third: International Reserves, External Supplier Shocks and Internal Stability Constraints:

According to the conditions of the rentier Iraqi economy, international reserves play a major role in stabilizing the Iraqi economy by facing the shocks of the external oil resource represented by fluctuations in the price of crude oil in its international market, which is at a high degree of uncertainty. The international reserves in the Iraqi economy also play a role in Exercising its internal economic stability by securing the requirements of current government spending, which the government cannot reduce or change because it represents the wages and pensions of citizens, as well as exercising the role of stabilizing the local currency (the dinar) against the dollar by meeting the demands of the private sector on the dollar to meet their imports from abroad, through Adopting a fixed exchange rate system and selling dollars through the central bank window. This can be represented by the following simplified diagram:

diagram (1)

The relationship of international reserves in Iraq to external shocks and internal restrictions
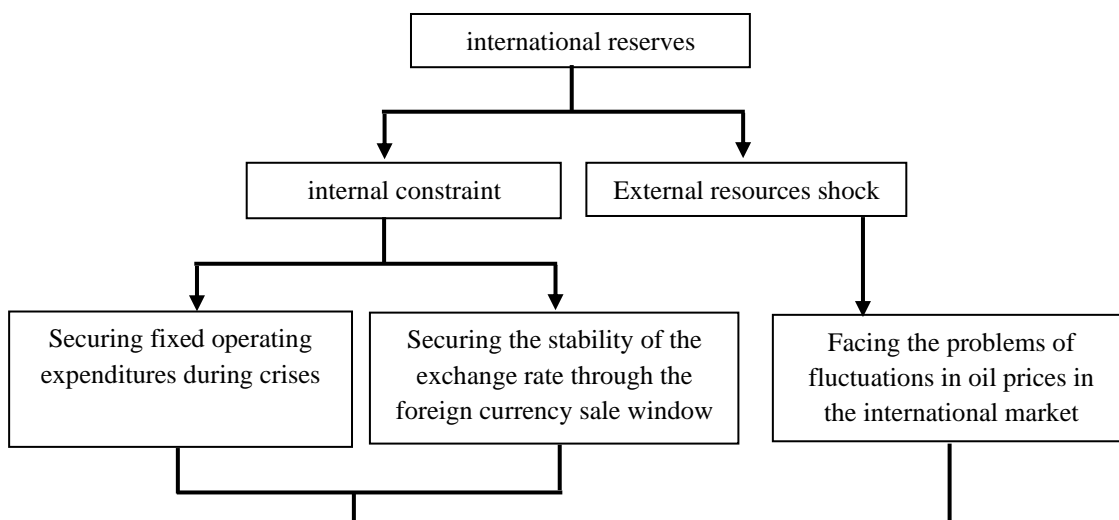
Based on this, the adequacy of international reserves can be analyzed in light of the external resource shock and the constraint of internal stability according to the following:

1- International reserves and external oil supplier shocks:

These shocks are represented by the fluctuations in oil prices in the international market, and the fears that result from the inability of the oil revenues obtained during times of low prices to keep pace with the requirements of government spending. The following table (6) shows the relationship:

Table (6)

International reserves in Iraq and world oil prices

Years	International reserves (millions of dollars)	Annual rate of change %*	The annual average price of the OPEC basket of crudes (dollars/barrel)	Annual rate of change %*
2005	11918	-	50.6	-
2010	50357	322	77.4	52.9
2011	60738	20.6	107.5	38.8
2012	70327	15.7	109.5	1.8
2013	77743	10.5	105.9	-3.2
2014	66349	-14.6	96.2	-9.1
2015	50881	-23.3	49.5	-48.5
2016	42802	-15.8	40.8	-17.5
2017	49399	15.4	52.4	28.4
2018	64722	31	69.8	24.3
2019	68020	5	64.0	-8.3
2020	57897	-14.8	41.5	-35.1
average	55929	35.1	72	24.5

Reference Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

*Calculated by the researcher.

From Table (6) we note that the global changes in OPEC oil prices, of which Iraq is a founding member, have fluctuated greatly and this is mainly due to the oil market conditions, which are not among the objectives of the research to address, as we find these prices are very high in the years of 2011. -2014, where it was $107.5/barrel, $109.5/barrel, $105.9/barrel, and $96.2/barrel respectively, then it decreased to $40.8/barrel in 2016 and to

$41.5/barrel in 2020. These price fluctuations are reflected in their annual rates of change. In addition, we find that international reserves had a positive trend with changes in oil prices, which indicates a strong correlation with them. Here, the reserves are trying to repel crises in times of low prices and rebuild themselves in times of high prices. It appears from the averages of the variables in Table (6) that the average annual change in international reserves for the period 2005-2020 was (35.1%), while the average annual change in oil prices for the same period was (24.5%), and this indicates that changes in international oil prices have an impact. On changes in reserves, but at a lower rate (24.5% <35.1%), which means that there is a surplus in international reserves, at least, estimated at 10.6% (35.1%-24.5%), which is the difference between the average rate of change in oil prices, and the average Annual rate of change in reserves.

2- International reserves and internal stability constraints:

The internal stability constraints, which the reserves should secure their gaps in in times of crisis, include the operating expenses that the government must pay, such as wages, pensions and retirement salaries, in addition to maintaining the stability of inflation rates and instilling confidence in the local currency as a cover for it, and this can be viewed through the table (7) Next:

Table (7)

International reserves, current year spending and currency window sales in Iraq (million dollars)

Years	international reserves	current year spending	Ratio of reserves to current year spending %*	foreign currency window sales	Ratio of reserves to foreign currency window sales %*
2005	11918	-	-	10463	113.9
2010	50357	46412	108.4	36171	139.2
2011	60738	51902	117	39798	152.6
2012	70327	49805	141.2	48649	144.5
2013	77743	67536	115.1	55678	139.6
2014	66349	50279	131.9	54463	121.8
2015	50881	39659	128.2	44304	114.8
2016	42802	47309	90.4	33524	127.6
2017	49399	50622	97.4	42200	117
2018	64722	65680	98.5	47133	137.3
2019	68020	51293	132.6	51125	133
2020	57897	46468	124.5	44080	131.3
Average	55929	51542	116.8	42299	131.0

Reference: 1- Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, separate annual numbers. 2- Central Bank of Iraq, Annual Statistical Bulletin, miscellaneous annual numbers.
*Calculated by the researcher.

From Table (7), it is clear that the general operational expenditure ranged between (39,659) million dollars in 2015 to (67,536) million dollars in 2013 and was fluctuating during the indicated period until it reached (65,680) million dollars in 2018 and (51293) million dollars. In 2019, it became (46468) million dollars in 2020. The Central Bank of Iraq's foreign currency sales (dollars) through the foreign currency window ranged between (10463) million dollars in 2005 to 55,678 million dollars in 2013. The important note in Table (7) is that international reserves exceed the current annual annual spending, as the ratio of international reserves to current year spending was (108.4%) in 2010, then the ratio became (141.2%) in 2012, and it ranged from (90.4%) to (132.6%) during the years 2016-2020. While the ratio of international reserves to current year spending on average during the period shown in Table (7) is (116.8%), which means that there is a surplus in international reserves at least equal to (116.8% - 100% = 16.8%). With regard to the average ratio of international reserves to the foreign

currency sales of the Central Bank of Iraq, it was during the period shown in Table (7) that it was (131%), which means, in the same direction, that there is a surplus in international reserves in the lowest estimates equal to (31%) of Reserves (131% - 100% = 31%).

Fourth: A proposed strategy for managing and achieving the adequacy of international reserves in Iraq:

Based on the data of the research, and based on the data of tables (6) and (7) and the analysis accompanying them, we found that there are surpluses in the international reserves that Iraq maintains above the required rates, which means the possibility of shifting in the management of reserves from the passive approach to the effective approach, In keeping with the basic objectives of the reserves in achieving liquidity, safety and return. Here, when the quantities of international reserves (IR) exceed the size that must be available to stabilize exchange rates, compensate for the necessary current spending, and instill confidence in the local currency and the banking system, the issue of return seems important, especially in long-term investment tools, because the return on safe and highly liquid investment tools Such as US treasury transfers and the like are low. Here we return to the data of tables (6) and (7) and their analyzes, where we can calculate the adequate international reserve according to the following:

1- Through the external resource shock (volatility in world oil prices), which is shown in Table (6), where there is a surplus in international reserves due to the fluctuation of oil prices, which was estimated at (10.6%) during the period 2005-2020.

2- By restricting the internal stability (securing operational expenses, and supporting the fixed exchange rate) as shown in Table (7), where it was found through analyzing the table data that there is a surplus in international reserves to the operational expenses payable during the indicated period, it was estimated at 16.8 %) and that there is a surplus in international reserves to the central bank sales of dollars to support the fixed exchange rate system was estimated at (31%).

3- If the average ratios of surpluses in the international reserves were taken in relation to the external shock of the resource and the internal stability was recorded during the indicated period, then it would be:
(10.6%) + (16.8%) + (31%) = 58.4% ÷ 3 = 19.4%.

This last ratio (19.4%) is the estimated surplus of international reserves based on the external resource shock and the constraint of internal stability.

If we multiply this percentage by the average official international reserves shown in Tables (6) and (7), we get the annual average surplus of reserves during the period 2005-2020 as follows:

55929 (million dollars) x 19.4% = 55929 x 0.194 = 10,850 million dollars.

And if we estimate the opportunity cost of maintaining surplus reserves by investing them in long-term and returnable financial instruments, by multiplying the calculated average surplus reserve by the average global interest rates on long-term government bonds shown in Table (8) below, we will get The estimated losses of the reserve surplus that could have been obtained had it been invested as follows:

(10850) million dollars x 1.88% = 10850 x 0.0188 = 203.9 million dollars. This last number is an average of one missed opportunity for each year during the period 2005-2020.

Table (8)
Average global long-term interest rates for five developed countries

Years	2005	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	average
Interest rate (percentage) *	3.52	3	2.9	2.16	2.22	1.96	1.43	1.05	1.31	1.59	1.02	0.44	1.88

Reference: Arab Monetary Fund, Unified Arab Economic Report, Statistical Supplements, Miscellaneous Annual Issues.

* Collected by the researcher as an average of interest rates in five industrialized countries on long-term government bonds (USA, Japan, UK, Eurozone, Canada).

As for the average adequate size of the international reserves in Iraq for the period 2005-2020, according to the above calculations, it is by subtracting the average annual surplus of international reserves from the average international reserves calculated in Table (7) and as follows:

55929 - 10850 = 45079 million dollars, and this is the assumed annual average adequate volume according to the external shock of the rose and the constraint of internal stability, meaning that this calculated adequate volume

(45049) million dollars is a volume capable of absorbing the two shocks together. The calculations of the adequate size of the international reserves mentioned above and calculated by the researcher based on the research data in light of the external resource shock and internal stability constraints can be summarized as follows:

$$K = \frac{\Sigma(\frac{\Delta IR}{IR} \times 100)}{n} \;-\; \frac{\Sigma(\frac{\Delta P}{P} \times 100)}{n}$$

$$T = \frac{\Sigma(\frac{IR}{e} \times 100)}{n} \;-\; 100\%$$

$$W = \frac{\Sigma\left(\frac{IR}{W} \times 100\right)}{n} \;-\; 100\%$$

$$ASSR = \frac{\Sigma(K+T+W)}{n} \;\times\; \frac{\Sigma(IR)}{n}$$

$$AASR = \frac{\Sigma(IR)}{n} \;-\; ASSR$$

Where: (K) is the average international reserves in comparison with the external resource shock, which is the difference between the average annual rate of change in reserves, and the average annual rate of change in oil prices.

(T) is the average international reserves in comparison with the internal stability constraint in terms of reimbursable operating expenses, which is the difference between (the average ratio of international reserves to current spending) and between the case in which there is no difference, i.e. 100%.

(W) is the average international reserves in comparison with the internal stability constraint in terms of foreign currency window sales, which is the difference between (the average ratio of international reserves to window sales in foreign currency) and the case in which there is no difference of any 100%.

(n) The number of years shown in the tables.

(IR) International Reserves.

(p) The average annual oil price.

(ASSR) average size surplus reserves.

Avarage surplus size of reserves .

(AASR) Average Adequate Size of Reserves.

Avage adequacy size of reserves.

The excess volume of international reserves for a adequate size can be invested and the opportunity cost of maintaining it in a highly liquid form can be reduced, by replacing the negative approach in managing reserves with another effective approach, based on maneuvering between the basic objectives of liquidity, safety and return, and going with the surplus reserves towards Better investment and exploitation outlets while bearing a higher risk. The opportunities in which the surplus reserve can be invested can be observed by noting the long sides of the following scheme (2):

diagram (2)
Management and adequacy of international reserves in Iraq

```
┌─────────────────────────┐                    ┌─────────────────────────┐
│ Maintaining the value   │                    │ Strengthening the       │
│ of reserves in light of │                    │ private sector and      │
│ the fluctuation of the  │                    │ pushing towards the     │
│ dollar in the direction │                    │ maturity of the market  │
│ of global currencies    │                    │ economy                 │
└─────────────────────────┘                    └─────────────────────────┘

                    ┌─────────────────────┐
                    │ Support due operating│
                    │ expenses             │
                    └─────────────────────┘

┌──────────────────┐      ┌──────────────────┐      ┌──────────────────────┐
│ Support the fixed│      │ Iraq's official  │      │ Reducing fluctuations│
│ exchange rate    │──────│ international     │──────│ in international oil  │
│ system           │      │ reserves         │      │ prices               │
└──────────────────┘      └──────────────────┘      └──────────────────────┘

                    ┌──────────────────────┐
                    │ Supporting confidence │
                    │ in the monetary and   │
                    │ financial system      │
                    └──────────────────────┘

┌──────────────────────────┐              ┌──────────────────────────┐
│ Diversification of       │              │ The opportunity cost of  │
│ reserves with various    │              │ holding the reserves     │
│ foreign investment       │              │ (global interest rate)   │
│ instruments              │              │                          │
└──────────────────────────┘              └──────────────────────────┘
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Reference: From the researcher's work based on the research data.

From diagram (2) we note that there are short parties from the center in the scheme represented by the official international reserve, and they represent the goals that must be adequate reserve to be taken into account and secured through the presence of a reserve with high liquidity and security, while the far parties from the center represent the goals that can be The Central Bank may achieve them with surplus reserves, which is the exploitation of the surplus reserves in areas generating returns or stimulating economic growth within the country, or taking into account the issue of preserving the value of reserves by diversifying them with different tools and currencies as a hedge against the depreciation of the dollar against other international assets.

7. Fourth requirement: conclusions and recommendations

first: Conclusions

1- Reaching to prove the hypothesis of the research, where the adequate volume of international reserves was calculated according to a mechanism adopted by the researcher, based on the shock conditions of the external oil resource and the constraint of stability in the obligation to secure the minimum operational public spending and to maintain the stability of the Iraqi dinar exchange rate against the dollar through a window Selling foreign currency. The reserve surplus was also calculated, and the opportunity cost was estimated as a result of not investing it or directing it in the right direction.

2- During the period 2005-2020, it was found that Iraq often maintains international reserves that are higher than their accepted global rates estimated according to the criteria of the optimal reserve size, as we found that the

reserves are greater than the desired rate based on the indicators of import coverage, the ratio of reserves to GDP, and the ratio of reserves to GDP. Reserves to money supply in the broad sense M2, and the extent of changes in reserves in relation to the change in the net balance of payments.

3- During the period 2005-2020, Iraq maintains international reserves greater than the adequate size needed to secure external shocks to fluctuating oil prices, and Iraq also maintains reserves greater than adequate size to secure the current public spending that must be repaid, as well as maintaining reserves greater than adequate size to secure the sale The foreign currency (the dollar) in the foreign currency window of the Central Bank in order to maintain the stability of the Iraqi dinar exchange rate.

4- There is an important distinction between the optimum size of the reserve and the adequate size of the reserve. Estimating the surplus and taking appropriate policies to invest the surplus in accordance with an effective approach to managing reserves.

5- The first source of the accumulation of international reserves in Iraq is through the surplus in the current account of the balance of payments resulting from the sale of the commodity crude oil, where the revenues of selling oil from the dollar are recorded in the account of the Ministry of Finance, then the latter exchanges the dollar for the Iraqi dinar with the Central Bank, either The central bank fulfills the private sector's dollar needs for the purpose of financing commodity and service imports, and the difference between them accumulates annually as an official international reserve.

Second: Recommendations

1- Liberating the traditional concept in managing Iraqi international reserves from a negative approach to an effective one by calculating the adequate volume of international reserves and not being satisfied with calculating the optimal size, and using the surplus reserves in areas of higher return for the development of reserves on the one hand, and strengthening its role in supporting growth and the new economic system .

2- The monetary authority can adopt the mechanism of calculating the adequate reserve according to the external resource shock and the internal stability constraint that was reached in the research, through each specific period of time, such as being (5) years, and then investing the reserve surpluses if they exist in the areas that enhance reserves, investing the surplus in long-term foreign government debt instruments, or giving subsidy initiatives and loans inside in order to strengthen the private sector and the foundations of the market economy.

3- The need for the government to adopt urgent and effective policies through which it supports the industrial, agricultural and service private sector and increase the capabilities in the field of competitiveness and export capabilities, in order for another stream to obtain hard currencies as well as the oil stream, and this works to reduce the burden on official international reserves in securing Facing external shocks and internal restrictions, and thus being able to shift a larger percentage of international reserves towards investment issues that generate more returns.

4- Reconsidering the fixed exchange rate system whenever there is a higher maturity in the capabilities of the private sector in the future in order to reduce the burden on international reserves and build them better to strengthen the state's international financial position.

5- Attempting to invest the surpluses of international reserves in investment tools with a higher return and greater risk whenever the surpluses are larger and larger than the optimal and adequate volumes to achieve economic stability and secure external and internal shocks.

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