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Mechanism for Correcting the Imbalance in the Agricultural Trade Balance and the Relationship with Economic growth in Iraq for the period (2000-2022)

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Abstract

The research touches on one of the most important economic indicators, which is the agricultural trade balance index and its relationship to economic growth in Iraq. Although Iraq has the potential to promote the agricultural sector to be the main economic sector, the reality in Iraq does not reflect this. The agricultural sector has deteriorated significantly in recent decades, reflected in the state of the trade balance, which remained in deficit throughout the period (2000-2020), despite the fact that the total trade balance was in surplus throughout the aforementioned period due to reliance on the export of only one raw material, crude oil. The study found that the trade balance suffers from chronic imbalances that have weakened its impact on economic growth in Iraq.

Keywords: Agricultural Trade Balance, Economic Growth, Agricultural Imports Coverage Index.

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آلية تصحيح الخلل في الميزان التجاري الزراعي وعلاقته بالنمو الاقتصادي في العراق للفترة(2000-2022)

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المستخلص:

ويتطرق البحث إلى أحد أهم المؤشرات الاقتصادية وهو مؤشر الميزان التجاري الزراعي وعلاقته بالنمو الاقتصادي في العراق. ورغم أن العراق يمتلك الإمكانيات للنهوض بالقطاع الزراعي ليكون القطاع الاقتصادي الرئيسي، إلا أن الواقع في العراق لا يعكس ذلك. وقد تدهور القطاع الزراعي بشكل كبير في العقود الأخيرة، وهو ما انعكس على حالة الميزان التجاري الذي بقي في حالة عجز طوال الفترة (2000-2020)، على الرغم من أن الميزان التجاري الإجمالي كان في فائض طوال الفترة المذكورة بسبب الاعتماد على الزراعة. على تصدير مادة خام واحدة فقط وهي النفط الخام. وتوصلت الدراسة إلى أن الميزان التجاري يعاني من اختلالات مزمنة أضعفت تأثيره على النمو الاقتصادي في العراق.

الكلمات المفتاحية :الميزان التجاري الزراعي، النمو الاقتصادي، مؤشر تغطية الواردات الزراعية.

Introduction

According to foreign trade theories, it assumes a state of balance between exports and imports in order to achieve economic growth. The agricultural sector may be given great importance as it provides final goods and intermediate goods, as it is the base from which economic growth and structural transformations are created. It was necessary to understand the tracks of the agricultural sector in Iraq, study it, and analyze the problems facing the agricultural trade balance, as well as to know the amount of leakage in the national income that goes to imports of agricultural goods. If growth is achieved in Iraq, it is not real, but based on the rise in the prices of goods exported from the extractive

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sector, in the sense that exports are limited to one or two commodities, while the structure of imports is diverse. This leads to a large imbalance in the trade balance. A standard model was formulated and the relationship between the variables was estimated to know the impact of some variables on economic growth in Iraq through the agricultural trade balance.

The repercussions of agricultural policy coupled with the low level of performance of the agricultural sector have widened the gap in the trade balance, and led to faltering efforts to achieve real economic growth based on the creation of added value. Researchers are aware of the sources of imbalance, so the research focused on measuring the imbalance in the agricultural trade balance and its relationship to economic growth in Iraq.

Hypothesis: The structural imbalance in the Iraqi agricultural sector was reflected in the agricultural trade balance. Consequently, the economic growth achieved was not real, and it didn't lead to the creation of added value in the economy, so it requires the interaction of fiscal and monetary policy in order to activate the contribution of the agricultural sector to the trade balance between Iraq and the outside world.

Objective: The study aims to clarify the nature of the imbalance in the agricultural trade balance in the Iraqi economy, which caused the faltering of agricultural development efforts. The study also aims to analyze the growth in the main indicators of the agricultural trade balance by diagnosing the causes and results, with the aim of finding a remedy to the imbalances in the Iraqi agricultural sector.

Problem: The subject of the imbalance in the trade balance is characterized by its capacity to be linked to other economic sectors, in various aspects because it is linked to the indicators and ratios of exchange between the local economy and the outside world. Therefore, it

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is necessary to pay attention to studying the first problem related to the study of the agricultural sector in Iraq. The second is to reveal the structural imbalance in the agricultural trade balance and the relationship of the economy with the outside world. From here, it is necessary to ask about the problem of the study in the following: What is the nature of the relationship between the agricultural trade balance and economic growth in Iraq?.

1. Agricultural Trade Balance … International directories and indicators

Interest in international trade has been active for decades because of the need for it and the theories explaining it have been developed, as the economists of the classical school stressed that international trade is beneficial to all parties of international exchange, as its importance increases in light of the availability of economic freedom factors, the opening of markets and competition, within the framework of Adam Smith's emphasis on specialization and the division of labor in that the productivity of labor is largely determined by the division of labor, as the fragmentation of labor leads to the worker's specialization in a specific part or specific parts of it, leading to the acquisition of skill and experience over time, which contributes to the development of productive art after which increase production **(Abd Al-Rida, 2015: 114)**. He pointed out that the size of the market depends mainly on the breadth of free trade, as surplus production requires large markets to be disposed of, so Smith called for freedom of trade. There is no sense in the part of work (which Smith was fascinated) unless there is freedom of trade, on the other hand, competition leads to a higher level of efficiency in the allocation of economic resources, and then to a higher level of

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production. As international trade is the engine of economic growth, and its positive results lead to an increase in national income, and therefore the growth of capital, which in turn leads to an increase in savings, does not lead to an increase in investment as a result of the expansion of markets resulting from the development of international trade **(Abdullah and Ibrahim, 1998: 75)**, so the measure of international trade has become an important measure by which to develop a comprehensive picture of a country's progress or delay, as the country in which its exports exceed its imports faces a surplus in the trade balance, while increasing its imports over its exports, the trade balance is in deficit.

The method of international trade exchange varies according to the economic thought and economic philosophy prevailing in the country concerned. In general, the economic philosophies that developed in the last century were methodologies that were adopted by different countries of the world that dealt and developed trade exchanges, even if they were selective in serving their economic and political interests. On the one hand, economic freedom is based mainly on the free movement of elements of production and not monopoly, which increases competition and then increases productivity, where development and excellence by producers contribute to reducing costs and thus reducing the prices of produced goods. On the other hand, restrictions on the freedom of trade in general without the existence of justifications will lead to an increase in the prices of produced goods, which means an increase in the burden on the consumer, especially in the case of high customs duties imposed on imports **(Zubon, 2015: 12)**. In general, the manifestations of international trade take the following forms:

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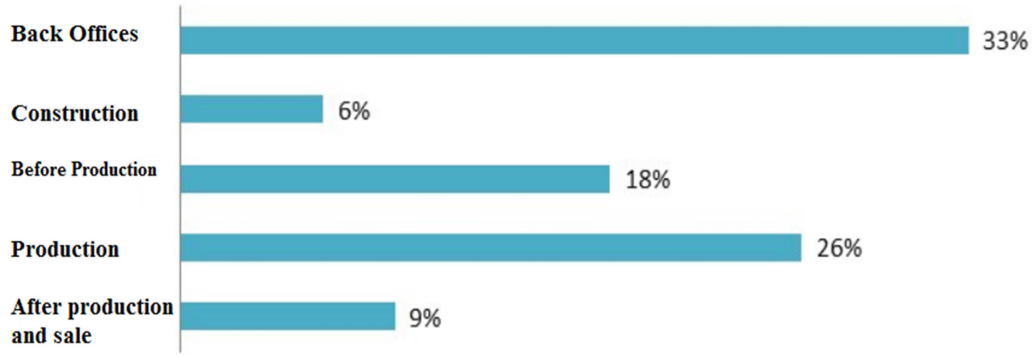
A. **Exchange of physical goods:** which move across the political borders of countries, these goods are either entering the country called imports, while leaving it called exports.

B. **Exchange of services:** Which leads from the nationals of one country to the nationals of another country, as the services performed by the nationals of the country to non-residents are called invisible exports, while the services received by the nationals of the country abroad who are non-residents are called invisible imports. It must be noted that information technology has promoted the emergence and development of new industries in the service sector, as these industries have created a demand for the industries accompanying them, so the service industry has become seen in one of its activities as intermediate inputs, as in production processes the share of services as intermediate inputs reached (92%), and in back offices and recurring services such as quality control and engineering services provided (33%), in the construction stages (6%), pre-production (18%), production (26%), and post-production and sale (9%). It can be illustrated by Figure (1).

Figure: 1

Share of services as intermediate inputs in the production process



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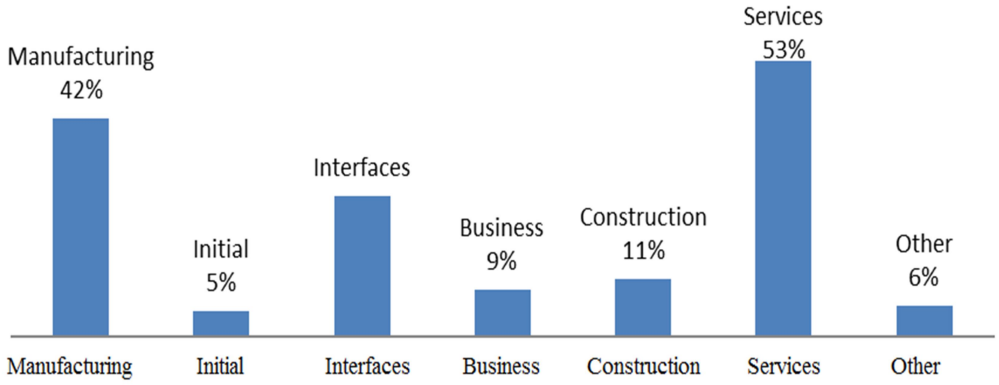
Source: UNCTAD, Trade and Development Board, Fifth Session, United Nations, Geneva, 2017, p.11.

With regard to the share of various economic sectors in foreign direct investment (FDI), the services sector has grown faster compared to other economic sectors, as it appeared in 2015 that the services share of FDI was (53%) compared to (42%) in the manufacturing sector, as shown in Figure (2).

Figure: 2
Foreign direct investment projects by sectors for 2015



Source: Prepared by the researchers based on: The role of the services economy and trade in structural transformation and inclusive development, United Nations Conference on Trade and Development, Note by the UNCTAD secretariat, Item 3 of the provisional agenda, United Nations, Geneva, 2017, p. 4.

A. **Capital transfer:** Capital moves abroad either in the form of direct investment by individuals and companies, or in the form of loans granted from one country to another.

B. **Foreign exchange market:** The flow of local currencies in contrast to the trend of imports, as the flow of foreign currencies in contrast to the trend of exports, this flow results in a set of transactions related to currencies, known as the foreign exchange market.

With regard to the above, it must be noted that both the balance of visible trade and the balance of invisible trade are collectively called the

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balance of current transactions in the balance of payments. It includes all economic transactions that take place between the country and the outside world that result from current production in the same period or that affect this production. What concerns us here is what is termed the balance of current transactions in the narrow sense that has been referred to, specifically the visible trade from it **(Hatem, 1993: 349)**. In general, the trade balance represents the most important components of the balance of payments. It refers to all material items related to the movement of goods, such as exports and imports of a specific country with the rest of the world in a specific period of time. The ready-made products, intermediate products and raw materials that can be seen have been tightened as they are recorded when they cross the border. The balance of the trade balance constitutes the difference between the value of exports and the value of imports. If the values of commodity exports exceed the values of commodity imports, the trade balance is in a state of surplus (Surplus). On the contrary, it is in a state of deficit that all visible commercial transactions are determined in a simple and fairly accurate manner. However, adjustments in value are made to facilitate the process of adapting customs statistics to the conditions of the balance of payments, as imports are recalculated from the prices of (C.I.F) to the prices of (F.O.B), as transport and insurance expenses are isolated from the basic expenses of purchasing goods **(Hajjar, 2003: 57)**. It must be noted that it does not always mean that the value of exports exceeds the value of imports in the interest of the country concerned as is customary, as the country may import more than it exports for the tendency of development projects in it, as many major industrial countries face a trade balance in a state of deficit where the value of imports exceeds the

value of exports, those countries depend in settling this deficit on their other revenues, such as services, interests and profits from their capital that are invested outside their territorial borders, while the state of deficit in the trade balance reflects the economic backwardness of a country if it is caused by **(Shehab, 2007: 239)**:

(1) The deficit occurs as a result of monetary reasons, such as the currency overstating its real value, which leads to a reduction in exports.

(2) The deficit is caused by non-monetary reasons, such as the depletion of the country's economic resources, which weakens the country's ability to export abroad.

On the level of the agricultural trade balance, it represents the difference between the agricultural exports of a country and its imports from it, whether those exports and imports of food commodities or raw materials, as agriculture and agricultural trade have a significant role in the economies of different countries, especially developing ones. At the international level, the total nominal value added to the agricultural sector ranged from (3%-4.5%) for the period (2000-2020) compared to the industrial sector, which reached between (27%-29%), while the service sector reached between (66%-68%). As in Figure (3), which shows the total nominal value added by economic activity.

Figure: 3

Total nominal value added by economic activity

for the period (2000 – 2020)

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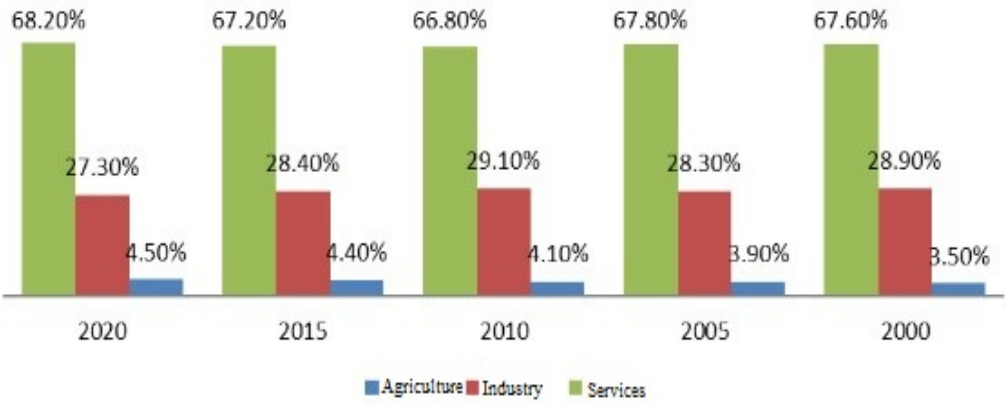

Source: United Nations, Handbook of Statistics, New York, (2000-2022).

In developing countries, agriculture is more than (9%), as the agricultural sector justifies one of the most important economic sectors, whether in terms of its contribution to GDP or by providing job opportunities and employment of labor directly or indirectly, as well as creating added value and providing food security, with the possibility of achieving integration between it and other economic sectors, at the level of input integration and production integration, especially as it provides an important percentage of inputs and raw materials for the industrial sector, in addition to intensifying the use of agriculture for industrial products such as machinery, fertilizers and others. Figure (4) shows the total nominal value added by economic activity in developing countries for the period (2000-2020).

Figure: 4
Nominal Gross Value Added by Economic Activity in Developing Countries for the period (2000 – 2020)

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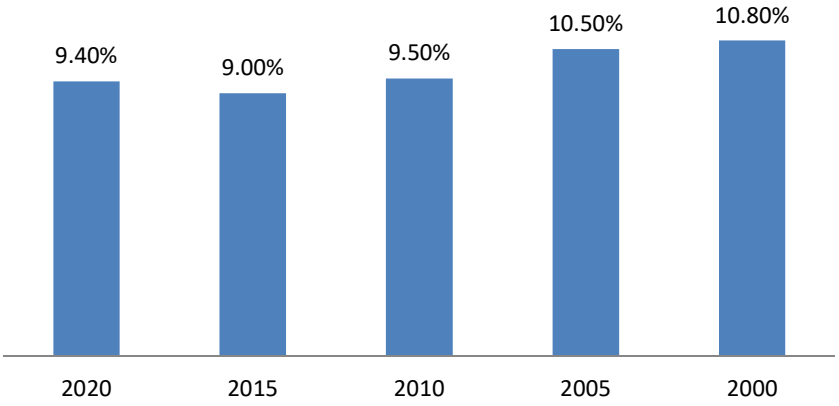

Source: United Nations, Handbook of Statistics, New York, (2000-2022).

With regard to international commodity exports, agricultural products have grown, which at the level of foreign trade is one of the indicators by which it is possible to judge the importance and status of agriculture in the country concerned, as it is one of the components of general trade and is related to meeting the need for increased demand for those products, especially since external trade of agricultural products is affected by the growth of agricultural production. If the volume of production exceeds the volume of consumption, an agricultural surplus appears that may be allocated to export, as the more the agricultural sector is able to provide its needs of foreign exchange necessary to provide its imports by exporting surplus of agricultural goods, then the trade balance reflects positive growth from its foreign trade. Conversely, if the agricultural sector is unable to provide its foreign exchange needs necessary to provide its imports by exporting surplus agricultural goods. In general, the foreign trade of agricultural products witnessed a significant fluctuation during the period (2000-2022) affected by the crises and events that took place in the world like other economic sectors, as in Figure (5).

Figure: 5

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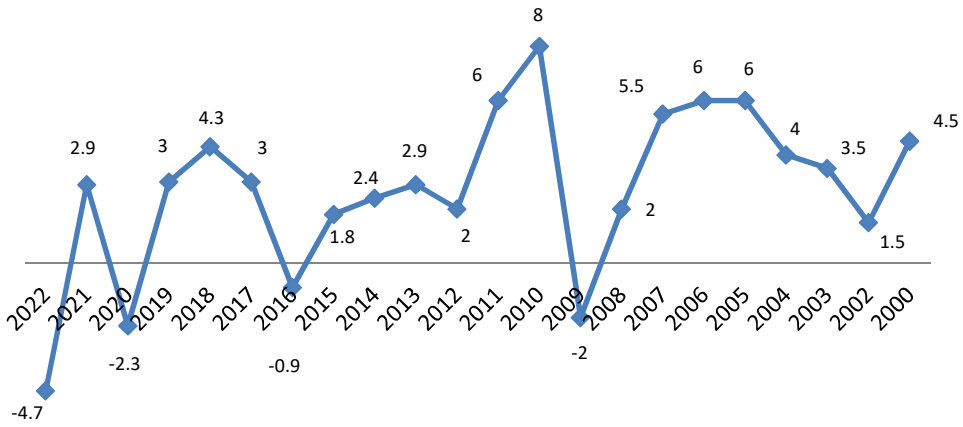
Growth in the volume of world commodity exports of agricultural products for the period (2000 – 2022) (%)



Source: World Trade Organization, World Trade Statistical Review (2000-2023).

2. Growth of the agricultural trade balance structure in Iraq

It is known that international economic relations have increased in importance due to the high percentage of foreign trade in the economy. Foreign trade in particular has occupied the status of the vital factor affecting economic activity, through the great interest in the subject of foreign trade so that the international economy has become one of the branches of important economic theories. Therefore, the agricultural sector occupies an important place in all the economies of the world. In Iraq, it is supposed to be one of the most important agricultural countries as the factors are available in terms of the fertility of its land and the abundance of its water. Thus, this sector should be one of the main economic sectors, but the reality of the agricultural sector does not reflect this, although the overall Iraqi trade balance is in surplus, but according to the commodity sections, it achieves a deficit in the trade balance of agricultural goods over time, especially since the commodity group is mostly food commodities that are consumed directly or enter into food industries or as inputs to agricultural, plant and animal production, which does not negatively affect the overall trade balance, which means that the

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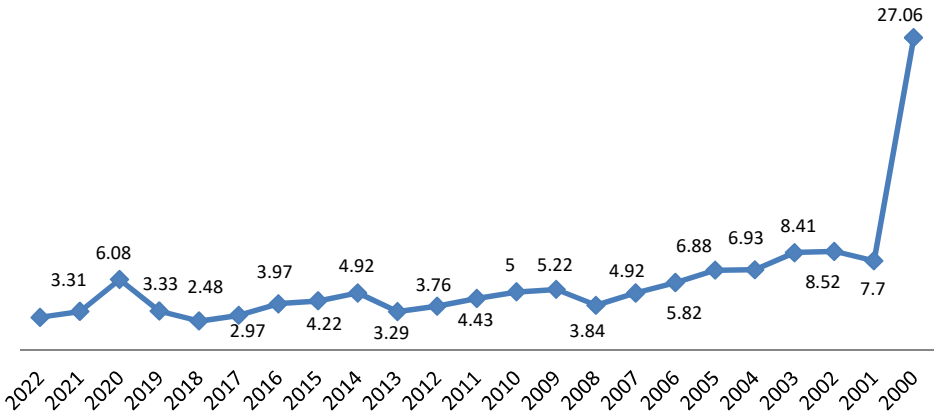
agricultural sector in Iraq is unable to finance its exports of these Goods, but the exports of other commodity groups are mainly used for oil exports for the purpose of financing them. Especially since one of the most important reasons that led to the decline in the relative importance of the agricultural sector in GDP is the growth of other economic sectors, mainly the oil sector **(Zaini, 2009: 113)**. The percentage did not exceed the limits of (10%) during the period (2000-2022) despite the great support provided by the government, after the relative importance of the agricultural sector exceeded the limits of (25%) in 2000, but this percentage decreased significantly in subsequent years until 2022 reached the limits of (2.8%). Figure (6) shows the relative importance of the agricultural sector in Iraq for the period (2000-2022).

Figure: 6
Relative importance of the agricultural sector in Iraq for the period (2000 – 2022)



Source: Ministry of Planning, Central Bureau of Statistics, Annual Statistical Collection, National Accounts, Baghdad, various volumes.
* World Bank Group: Available at: https://data.albankaldawli.org

2. 1. Agricultural Sector Exports

Exports play a major role in the economies of countries, whether developed or developing. From a technical point of view, exports foreseen in the credit side of the trade balance are restricted, because the

export process entails the transfer of ownership of goods from residents to non-residents, noting that there is a problem related to the way in which the value of exports is restricted. The reason is that different countries do not follow a unified basis in this regard. The value of exports is often recorded on the basis of their value (F.O.B), that is, on the basis of their price at the port of export before they are added to transport and insurance expenses **(Abdullah and Ibrahim, 1998: 91)**. This applies to the exports of the agricultural sector. Through exports, the country is able to dispose of its domestic production surplus, which results in the expansion of the market and the provision of its foreign exchange needs **(Alimat, 2018: 363)**, as it is one of the total injection elements that supply the country with foreign exchange, as the amount of agricultural exports reflects the surplus in agricultural production and the comparative advantage of production **(Ahmed and Salem, 2019: 181)**. The figures in Table (1) indicate that the maximum value of agricultural exports in 2013 was about (82) million dollars, while the lowest value of agricultural exports was during the period (2000-2005), and agricultural exports are not a significant percentage of total exports despite the attention given to the agricultural sector in national development plans or even in terms of the great support provided to the agricultural sector, the latest of which is the agricultural initiative, which estimated the financial allocations of the implementing agencies for the period (2008-2011) at about (2288940) million dinars **(Al-Jazrawi and Al-Azzawi, 2013: 397)**. Therefore, the agricultural export sector continues to translate the state of significant deterioration of the agricultural sector. This is evident in the decline in its relative importance of total exports that did not exceed (1%) over the period (2000-2022). For example, Iraq's exports of agricultural products represent dates, which decreased by (87%) for the period (2000-2017) **(Makhlif and Muhammad, 2019: 227)**. It means that there is a

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weakness in its impact on the overall trade balance, as agricultural production has declined, which weakens the food industries in terms of quantity and quality, due to the deterioration of security, economic and natural conditions. In addition to the marketing difficulties faced by agricultural exports due to the fact that they often do not conform to the standard specifications required in foreign markets, despite government measures that seek to improve the competitiveness of agricultural products.

2. 2. Imports of the agricultural sector

Technically, within the framework of the trade balance, visible imports benefit on the debtor side of the balance, because the import process results in the transfer of ownership of goods from non-residents to residents on the basis of their value (C.I.F), that is, on the basis of the price of the commodity at the port of destination plus transportation and insurance expenses. This applies to agricultural imports, in Iraq because of the economic openness by adopting the new approach in managing the economy and the transition towards a market economy by using market mechanisms instead of a centrally planned economy. Therefore, the general trend towards trade liberalization with weak domestic agricultural production and the deterioration of the economic situation of the agricultural sector in general, contributed to a significant increase in agricultural imports due to the trend to import within the framework of economic activity, which left a clear impact on the volume of agricultural foreign trade. It is noted from Table (1) that agricultural imports change from year to year, rising and falling, with imports reaching the highest value of (7018) million dollars in 2012, and reaching the lowest value of (1310) million dollars in 2015. The reason for this rise and decline is the policy adopted by the country to lift restrictions and trade barriers. Imports sometimes increase or decrease, as a result of the imposition of

the ban on many agricultural products in order to improve the reality of the agricultural sector and encourage the Iraqi agricultural product. As for the relative importance of agricultural imports from the total imports, they recorded high rates during the first years of the research period, which witnessed the highest level in 2003 and the lowest level in 2013, reaching (18.18%) and (2.28%) respectively.

Table: 1 Main indicators of the agricultural trade balance for the period (2000-2020)

Year	Total exports (Million dollars)	Total imports (Million dollars)	Agricultural exports (Million dollars)	Relative Importance of Agricultural Exports (%)	Agricultural imports (Million dollars)	Relative importance of agricultural imports (%)	Agricultural Trade Balance (Million dollars)
2000	18742.6	12329.6	7	0.04	1720	13.95	-1713
2001	12872.1	12490.4	7	0.05	1583	12.67	-1576
2002	12218.8	9346.2	7	0.06	1583	16.93	-1576
2003	9711.1	9456.7	7	0.07	1720	18.18	-1713
2004	17810.1	20279.8	7	0.04	1720	8.48	-1713
2005	23697.4	22002.4	7	0.03	1882	8.55	-1875
2006	30486.7	20543.8	8	0.03	1807	8.75	-1799
2007	39627.3	20331.5	10	0.03	1997	9.82	-1987
2008	63144.8	35172.2	12	0.02	2057	5.84	-2045
2009	39259.2	38273.5	10	0.03	1997	5.21	-1987
2010	51764	43915	41	0.08	6081	13.84	-6040
2011	79681	47803	43	0.05	6729	14.07	-6686
2012	94171	55169	50	0.05	7081	12.72	-6968
2013	89768	59349	82	0.09	1354	2.28	-1272
2014	83981	53177	79	0.09	1332	2.5	-1253
2015	49320	52000	70	0.14	1310	2.51	-1240

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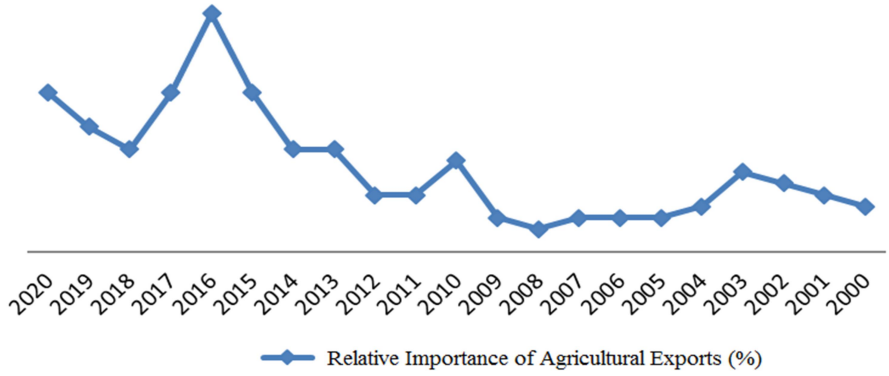
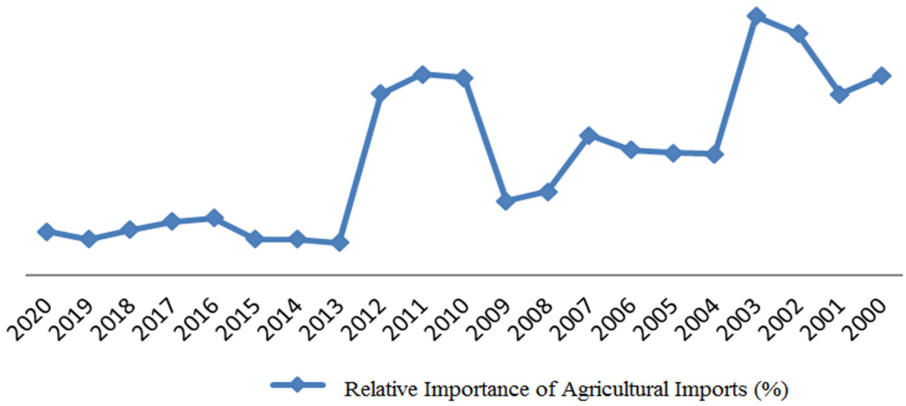
2016	41298	34208	81	0.21	1374	4.01	-1293
2017	57595	37866	79	0.14	1421	3.76	-1345
2018	86360	45736	77	0.09	1449	3.16	-1372
2019	81585	58138	80	0.11	1470	2.52	-1390
2020	46829	48150	65	0.14	1468	3.04	-1403

Source: Arab Monetary Fund, Unified Arab Economic Report, Abu Dhabi, various volumes.

Figure: 7
Relative importance of agricultural exports and imports for the period (2000-2020)



Source: Arab Monetary Fund, Unified Arab Economic Report, Abu Dhabi, various volumes.



Source: Arab Monetary Fund, Unified Arab Economic Report, Abu Dhabi, various volumes.

2. 3. Agricultural Trade Balance and Import Coverage Index

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The agricultural trade balance represents one of the components of the total trade balance, in which the total trade balance witnessed surpluses for the period (2000-2022), except for the years 2003, 2009 and 2020, as the value of oil exports decreased for reasons related to the change of the political system in Iraq, the mortgage crisis and the repercussions of the Covid-19 crisis **(Al-Khazraji and Aziz, 2023: 225)**. However, the agricultural trade balance was negative throughout the study, as the total deficit below in 2015 amounted to (1240) million dollars, while the highest value was (2045) million dollars in 2008. This deficit reflects the low level of agricultural production, the low volume of agricultural projects and the weakness of local agricultural industries, and thus the inability of the agricultural sector to meet the need of domestic demand. This is known as the Import Coverage Rate, which indicates the weakness of agricultural exports in their ability to meet the country's needs of agricultural imports, as the rate did not exceed the limits of (6.05%) in 2013, which is the highest coverage rate, as the percentage decreased again until it reached (4.42%) in 2020, which means the widening of the gap between the value of agricultural exports and the value of agricultural imports, in order to indicate a state of food dependence abroad due to weak levels of agricultural production and low efficiency and productivity. As shown in Table (2) and Figure (8).

The possibility of reducing the continuing deficit in the agricultural trade balance must be shown, which is related to the extent of Iraq's ability to invest its agricultural resources such as land, water, livestock, and fisheries with high efficiency, in addition to the need to adopt successful agricultural policies through agricultural investment, in order to improve the level of production and thus promote the reality of the agricultural sector as a vital sector and a tributary of the Iraqi economy.

Table: 2

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Rate of export coverage of agricultural imports in Iraq for the period (2000-2020)

Year	Agricultural exports (Million dollars)	Agricultural imports (Million dollars)	Coverage rate (%)
2000	7	1720	0.4
2001	7	1583	0.44
2002	7	1583	0.44
2003	7	1720	0.4
2004	7	1720	0.4
2005	7	1882	0.37
2006	8	1807	0.44
2007	10	1997	0.5
2008	12	2057	0.58
2009	10	1997	0.5
2010	41	6081	0.67
2011	43	6729	0.64
2012	50	7018	0.71
2013	82	1354	6.05
2014	79	1332	5.93
2015	70	1310	5.34
2016	81	1374	5.89
2017	79	1424	5.54
2018	77	1449	5.31
2019	80	1470	5.44
2020	65	1468	4.42

Source: Arab Monetary Fund, Unified Arab Economic Report, Abu Dhabi, various volumes.

Figure: 8
Rate of export coverage of agricultural imports in Iraq for the period (2000-2020)

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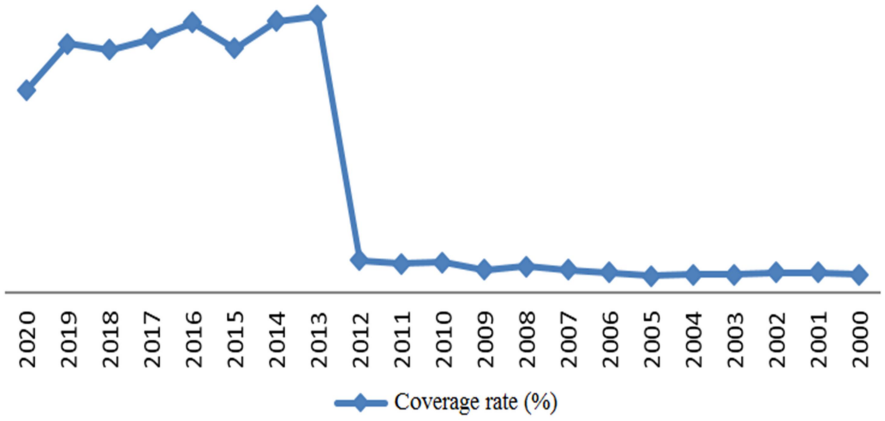

Source: Arab Monetary Fund, Unified Arab Economic Report, Abu Dhabi, various volumes.

3. Analysis of the relationship between the agricultural trade balance and economic growth in Iraq

Describe the econometric model and its mathematical formulation, then interpret the estimated results and predict the future of the variables in the light of economic theory, to benefit from the results in policy-making for the agricultural sector in Iraq.

3. 1. Description: Variables are classified into dependent and independent variables, as in the following model:

A- **Dependent Variable:** Represented by GDP, which reflects the material measure of economic growth (GDP_t), and the other variable represents the agricultural imbalance (AIB_t) in local currency (Iraqi dinar).

B- **Independent Illustrative Variables:** The illustrative variables are total exports *(TE_t),* total imports (TX_t), and agricultural exports (AX_t).

3. 2. The mathematical formulation of the model: The researchers relied on the system of equations with mutual effect (Instantaneous) to indicate the nature of the mutual relationship between the variables in the model , especially between GDP and agricultural imbalance, as the relationship between (**GDP_t**) and agricultural imbalance (**AIB_t**) is a two-

way relationship, which means that the impact between the variables is mutual. The adoption of the instantaneous equations model is required to measure the implicit relationship between the variables of the model **(Gujarat: 2015: 928),** as follows:

The special model can be formulated in the study for the period (2000-2020) as follows:

Model No. (1) above can be represented in the form of the following linear matrices:

$$\boldsymbol{Ya = Xb + e} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(1)}$$

Whereas:

$$\mathrm{Y} = Endogenous\ variables$$

$$a = Coefficients\ of\ the\ Exogenous\ variable$$

$$X = \ Exogenous\ variables$$

$$\mathrm{b} = Coefficients\ of\ the\ exogenous\ \ variable$$

$$\mathrm{e} = Stochastic\ disturbances$$

Therefore, the model of simultaneous equations can be formulated as follows:

$$\boldsymbol{AIB_t = \beta_0 + \beta_1 GDP_t + U_{1t}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(2)}$$

$$\boldsymbol{GDP_t = TE_t + TX_t + AX_t} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \mathbf{(3)}$$

The researchers can apply the (LS) model by adopting statistical and standard tests in the (Eviews12) program, because the estimation is (LS) method since the variables of the model overlap in impact, as (GDPt) is affected by the imbalance of the trade balance (ABIt), as the imbalance in the agricultural balance is affected by the total exports, imports, and agricultural exports, so the appropriate model to estimate the functional relationship (LS), to show the complementary relationship between the variables of the model **(Hassan &Salman, 2009: 173)**.

3. 3. Stability Test:

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Stability test helps researchers get rid of the problem of Spurious Regression in time series that include two types of models: **(Dickey & Fuller, 2010: 431)**

1- **Fixed Trend Model:** The formula is ($X_t = f(t) + \varepsilon_t$) because it is polynomial during time, as it suffers from instability because the average is related to the time period, in the case of estimation (2SLS) method, it is stable.

2- **Second model is called the fixed difference:** it is unstable and random, takes the form of ($X_t = X_{t-1} + \beta + \varepsilon_t$), it is stable depending on the differences.

The Dickey-fuller test is one of the most important tests used in time series data, as it confirms stability or not, it is effective whether the Spurious Regression in the first model is the trend, or in the second model is the fixed difference, as the researchers relied on this test and the self-regression model of the first degree (AR (1)), as it writes, that ($X_t = X_{t-1} + \varepsilon_t \varepsilon_t$) represents Random Error with an mean of zero and the variance is fixed and the values are not related, in the case of the regression coefficient is equal to the correct one, that is, the presence of the root of the unit, so the series is unstable as it suffers from a trend in time series data, called the Random Walk, one of the test is based on the hypothesis ($H_1: |\emptyset| < 1$) **(Kashif, Mohammad, 2017: 508)**

$$\nabla X_t = \lambda X_{t-1} - \sum_{j=2}^{P} \emptyset \nabla X_{t-j+1} + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (4)$$

$$\nabla X_t = \lambda X_{t-1} - \sum_{j=2}^{P} \emptyset \nabla X_{t-j+1} + c + \varepsilon_t \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (5)$$

$$\boldsymbol{\nabla X_t = \lambda X_{t-1} - \sum_{j=2}^{P} \emptyset \nabla X_{t-j+1} + c + Bt + \varepsilon_t} \dots\dots\dots\dots\dots\dots\dots\dots\dots\dots (6)$$

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The researchers relied on the value of (Prop), which represents the probability when the value is less than (0.05) that it is stable, but in the event that the value is greater than (0.05) that the variable is unstable, or the stability in the variable is the result of a comparison between the value of (t) calculated and the value of (t) tabular, as in Table (3): **(J.G. Mackinon, 2015: 452)**

- When the$t$ calculated (t) is greater than the tabular (t) value, we accept the alternative hypothesis $(H_1 \neq 0)$, that is, the variable is stable.
- When the$t$ calculated (t) is smaller than the tabular (t) value, we reject the alternative $(H_1 \neq 0)$ because the variable is unstable.

After the test, it became clear that all variables are stable with the first difference at a significant level (0.05). As for the level, it was unstable. This requires the adoption of variables with the first difference when estimating regression equations.

Table: 3
Dickie Fuller Stability Test

VAR		Test I(0) ADF			Test I(1) ADF		
		Individual Intercept	Intercept & Trend	None	Individual Intercept	Intercept & Trend	None
GDP	0.05	392.	3.200	1 - 7 / 418	31 - 100	.743	270
t-Statistic		1–769	266	0.257	.052	.244	.377
stigma	0.05	.585	3.200	1 - 7 / 418	148	-424	-270
t-Statistic		1-9/401	710	.703	4--032	-912	245
TE	0.05	{\1cH4080FF}-555;	- 830.	.864	3.	3.	270
t-Statistic		989	-863	-0.008	047	191	946
TX	0.05	3.050	3.200	1 - 7 / 418	-002	593	-270
t-Statistic		1 / 248	- 412.	590	506	-768	1-4 / 430
AX	0.05	.585	3.200	1 - 7 / 418	-002	.743	-270
t-Statistic		.154	0.963***	1 626	134	.028	-528

Source: Table was prepared by the researchers based on the results of the statistical program (Eviews12).

4. Estimating the regression equation

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A. **Agricultural imbalance (AIBt):** It is a variable that affects the GDP, as every change in the agricultural imbalance once affects the GDP by (3.6) inversely, that is, the greater the imbalance in the trade balance, the lower the growth rate and vice versa, because it represents an increase in the currency coming from the extractive sector , that is, the growth in Iraq comes from the exports of the extractive sector is not real growth, so the imbalance in the agricultural sector leads to an increase in agricultural and food imports from abroad, to show the probabilistic value (Prob) by (0.04), which leads to a correlation between the agricultural imbalance and GDP.

B. **Total exports (TEt):** It is an illustrative variable that affects the GDP, as the total Iraqi exports by one time, it affects the GDP by (4.2) directly , which is a result of the fact that the total Iraqi exports include the oil exports on which the GDP is based, which consists of up to (60%) of the Iraqi GDP, which was in line with what was expected.

C. **Total Imports (TXt):** A large percentage of government spending and private sector spending goes to imports because there are no commodity sectors that produce added value to cover the need of the local market. The teacher's estimate showed that each change in total imports once negatively affects GDP by the variable coefficient of (-2.9). This shows the size of the losses suffered by the Iraqi economy due to the inertia of the productive apparatus and its inability to compete and allocate local natural and human resources optimally.

D. **Agricultural exports (AXt)**: Iraq's agricultural exports do not differ from other goods produced in Iraq, as they are characterized by their lack of competitiveness in regional and global markets, for many reasons, the most important of which is the exchange rate of the Iraqi dinar denominated in dollars at a higher value than its real value. This

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procedure weakens the competitiveness of goods produced in Iraq, and enhances the competitiveness of imported goods, as well as financial and administrative corruption in imposing taxes on imported goods, which makes them target Iraqi markets, so that the goods produced in Iraq do not have the ability to compete in local and global markets, as well as the spread of diseases and epidemics in Iraqi agriculture, due to primitive methods in agriculture, the use of pesticides and fertilizers, and the adoption of traditional agricultural cycles. However, agricultural exports are considered to affect GDP, as every change in Iraqi agricultural exports once affects GDP by (1.5).

E. The logarithmic function used for the model is the best representation by estimating the coefficients of the variables if they are flexible. The value of (R^2) can be known by the error rate and show the impact of the variables that the researchers did not enter in the model, as the value was (60%), so the explanatory variables explain the changes that occur in GDP by the amount of the value mentioned above, and that (40%) are affected by variables that were not included in the model.

F. Fisher's test completely clarifies the significance of the model, as shown by its value of (10.9). The (D.W) test also showed that the model is free from the problem of self-correlation, as the value of (DW) is in the acceptance area of (2.09).

Table: 4 Model Parameter Estimation Test (LS)

Independent variable:				
Method: Least Squares				
Date: 07/12/27 Time: 10:40				
Sample: 2000 2020				
Included observations: 20				
Instrument specification: (GDP) (AIB) (TE) (TX) (AX)				
PROB	**t-Statistic**	**Std. Error**	**Coefficient**	**Variable**
0.04	**3,619**	**1.071**	**613**	**Stigma**
0.02	**3.859**	**1.104**	**4.240**	**TE**
0.03	**+971 2 658**	**.985**	**926**	**TX**
0.03	**2.438**	**.618**	**1.503**	**AX**

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1.57	Mean dependent Var	0.65	R-squared
727	S.D. dependent Var	0.60	Adjusted R-Squared
1.03	Sum Squared Resid	3379	S.E. of Regression
2.09	Durbin-Watson stat	10.96	F-Statistic
3.96	Second-Stage SSR	0.0005	Prob(F-Statistic)

Source: Prepared by the researchers based on the statistical program (Eviews12).

5. Conclusions and recommendations

5. 1. Conclusions

1- There is a negative significant relationship between economic growth in Iraq and the imbalance in the agricultural trade balance, as every change in the trade balance by one time affects the GDP by (3.6), due to the imbalance in the trade balance is reflected in the increase in Iraqi imports of agricultural goods and foodstuffs, which are supposed to be spent on the products of the Iraqi agricultural sector.

2- There is no clear vision for agricultural policy in Iraq, as no laws have been enacted to serve the agricultural sector so as to contribute to creating an attractive investment environment, and there is no support policy for agricultural products.

3- Investing in the agricultural sector is the shortcut to achieving sustainable food security, and it also contributes to creating jobs that achieve added value in the economy instead of relying on the extractive sector.

4- Investment in the agricultural sector reduces the imbalance in the agricultural trade balance, and also enhances the result of estimating the equation by affecting the real growth rate through commodity production and directly affecting GDP.

5. 2. Recommendations:

1- The necessity of adopting a monetary and financial policy for investments in the agricultural sector, providing support with imports of seeds, pesticides and fertilizers, and an export policy that supports

the agricultural product, especially for goods that Iraq has an absolute advantage in producing.

2- Providing a special credit facility to support the agricultural sector to address the imbalance in the trade balance, and issuing green treasury bonds dedicated to supporting projects that support sustainable development or address the imbalance in the agricultural sector.

3- Stimulate investment in the agricultural sector by lowering interest rates and providing soft loans that promote sustainable economic growth.

References

1- Abd al-Rida, Nabil Jaafar. (2015). ***Economic thought evolved from Plato to Friedman***, Basra, Al-Ghadeer Printing and Publishing Company.

2- Abdul Qader, Sayed Metwally. (2007). ***Deriving the error correction model from Johansen's equal integration test: a theoretical framework and an applied example using*** EViews6, Higher Institute for Computing, Management Information Systems and Management Sciences, Shubra Khaimah.

3- Abdullah, Muhammad Issa, Ibrahim, Musa. (1998). ***International Economic Relations***, Beirut, Dar Al-Manhal Lebanon.

4- Alimat, Muhammad Atallah. (2018). The ***Impact of Agricultural Exports on the Jordanian Trade Balance***, World Journal of Economics and Business, Rafad for Studies and Research, 4 (3).

5- Al-Jazrawi, Ibrahim, Al-Azzawi, Ibrahim Tariq. (2013). ***Evaluation of the performance of the agricultural initiative by application in the Agricultural Cooperative Bank***, Journal of Economic and Administrative Sciences, Faculty of Management and Economics, University of Baghdad, 19 (74).

6- Al-Khazraji, Wissam Mohammed Hussein, and Aziz Khalil Ismail. (2023). ***The Impact of Cash Supply on the Iraqi Trade Balance for the Period (***2004-2022***)***, Tikrit Journal of Administrative and Economic Sciences,

Faculty of Management and Economics, University of Tikrit, 19 (64), Part (2).

7- D.A. Dickey and W.A. Fuller. (2010). ***Distribution of the Estimators for Autoregressive Time Series with a Unit Root***, Journal of the American Statistical Association, vol. 74.

8- Gujarat. (2015). ***Econometrics***, Dar Al Mareekh for Printing and Publishing, translated by: Dr. Hind Abdel Ghaffar Odeh, Riyadh, 1st Edition, Part (2).

9- Hajjar, Bassam. (2003). ***International Economic Relations***, Beirut, University Foundation for Studies and Publishing.

10- Hassan B. Ghassan and Salman AL Dehailan. (2009). ***Test of Non-Liner Co-integration between Government Investment and Private Investment in Saudi Arabia Economy***, MPRA.

11-Hatem, Sami Afifi. (1993). Foreign Trade between Theorizing and Organizing, Book 1, 2nd Edition, Cairo, Egyptian Lebanese House.

12- J.G. Mackinon. (2015). ***Critical values of Contegration Tests in R. E. Engle and C. W.J. Granger, eds, long–run Eonomic Relationships: Readings in Co-integration***, Chap 13, Oxford University press, New York.

13- Kashif, Mohammad. (2017). ***Impact of economic growth on international reserve holdings in Brazil***, Brazilian Journal of Political Economy, vol. 37, No. 3 (148).

14-Makhlif, Thamer Zaidan, and Mohammed, Imad Muzahim. (2019). ***Economic and metric analysis of Iraq's foreign exports of dates for the period (2017-1995)***, Tikrit Journal of Administrative and Economic Sciences, Faculty of Management and Economics, Tikrit University, 15 (27), Part (2).

15-Shehab, Majdi Mahmoud. (2007). ***Contemporary International Economics***, Alexandria, Dar Gamaa Gadida.

16-Zaini, Muhammad Ali. (2009). ***The Iraqi Economy (Past, Present and Future Options)***, Baghdad, Dar Malak for Arts, Literature and Publishing.

17-Zubon, Atallah Ali. (2015). ***Foreign Trade***, Amman, Dar Yazori.