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The Impact of Agricultural Trade on the Trade Balance and Economic Growth for the Period 2015–2022 A Comparative Study of Iraq, Egypt and Morocco

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I. Abstract:

This study seeks to analyze the influence of agricultural commerce on the trade balance and economic growth by conducting a comparative analysis of agricultural imports and exports in three Arab nations: Iraq, Egypt, and Morocco, from 2015 to 2022. The research utilized data on agricultural imports and exports, alongside regression analysis and Granger causality tests, to assess the directional relationship between agricultural trade and the trade balance .The data also revealed that Iraq suffers from chronic and continuous deficit in its agricultural trade balance due to high imports and weak exports, and that there is no obvious causal relationship between the exports and the trade balance. Meanwhile, Egypt was able to produce a big and sustainable agricultural surplus supported by its strong export capacity. The causality test confirmed a significant relationship between exports and trade balance at lag two (lag=2) which means that agricultural trade plays a positive role in supporting economic growth .Morocco, meanwhile, recorded a moderate agricultural trade surplus, with no dynamic causal relationship, suggesting limited stability in agricultural trade performance.

The research also came to the conclusion that agricultural commerce is an important component in enhancing both the trade balance and economic growth. Nevertheless, the impact of agricultural trade differs from country to country due to the nature of the agricultural sector in each country .The study advocated for the implementation of cohesive agricultural and trade policies to enhance exports, diminish reliance on imports, and fortify regional collaboration to attain agricultural integration and food security.

Keywords: agricultural trade, trade balance, economic growth, regression, agricultural openness, causality testing, Arab countries.

II. Introduction

The agricultural sector is one of the main pillars of the economy in many developing and developed countries due to its significant role in achieving food security, creating employment opportunities, and boosting revenue through exports. One of the most important tools of linking agriculture to the macroeconomy is agricultural trade. It helps to improve the trade balance and contributes to economic growth through increasing exports or reducing dependence on imports .Arab countries, including Iraq, Egypt and Morocco, face a range of challenges and opportunities in this area, linked to the effectiveness of agricultural policies, the level of domestic production, and trade openness to global markets.

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1. **Research problem:** Agricultural trade has undergone structural changes as a result of trade liberalisation, fluctuations in global prices and supply chains; these changes affect the trade balance through exports and imports of agricultural commodities, and economic growth through productivity, employment and food security. The research problem is as follows :

   What is the nature and extent of the influence of agricultural trade (exports, imports, and openness) on the trade balance and economic growth? Is there a distinction in this impact between the short term and the long term?

2. **Research questions :**
   - What is the nature and extent of the impact of agricultural exports on the trade balance?
   - How do agricultural imports affect the trade balance and growth in the short and long term?
   - Does agricultural trade openness affect the real GDP growth rate?
   - What is the direction of causality between agricultural trade and both the trade balance and growth?
3. **Aims of study:** The research aims to focus on:
   - Measuring agricultural trade (exports/imports/openness) on the trade balance.
   - The ratio of agricultural trade to real economic growth.
   - Testing for effort-related differences and causation.
   - Developing supportive trade and agricultural policies to improve the trade balance and promote growth.
4. **Significance of the research :**The importance of this research can be viewed in terms of theoretical, practical and developmental perspectives. From the theoretical point of view, the study can be said to provide a significant addition to the literature that links the literature on agricultural trade with the literature on other commodity trade. Put practically, it is seen as providing quantitative evidence to policy makers as to which approach is more effective. Export support? Import substitution? Or selective mix? Finally, from a development perspective, it can be seen as a link between the direct impacts of rural employment and food security and local value added.
5. **Research hypotheses:** The significance of the research is underpinned by the following hypotheses:
   - Hypothesis 1 (H1): Agricultural exports have a positive and significant effect on the trade balance.
   - Hypothesis 2 (H2): Agricultural imports have a negative impact on the trade balance in the short term, but may have a positive impact on growth if they are used as production inputs.
   - Hypothesis 3 (H3): Agricultural trade openness has a positive impact on the real GDP growth rate.
   - Hypothesis 4 (H4): There is a Granger causality relationship from agricultural trade to the trade balance and growth, which is stronger than the reverse.
6. **The scope of the study:** The researcher has decided to set the time frame of the study as the period from 2010 to 2013, and has chosen to conduct a comparative study between Iraq and certain Arab and regional countries, specifically Egypt and Turkey, with a particular emphasis on agricultural trade. This study will include agricultural goods and products, but will not include services.

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Theoretical framework and previous studies

1. **The concept of agricultural trade :**Agricultural businesses, commercial farming, or the agricultural industry as a whole? The term "agribusiness" refers to companies that are involved in some or all of the agricultural production systems that come under the following categories: Crop production, which includes farming, contract farming, the provision of seeds and agricultural chemicals, agricultural mechanisation, wholesale trade, distribution, food processing, marketing, and retail sales respectively (Ahmed & Almosabbeh: 2024)

Agricultural trade denotes the exchange of agricultural products among nations, characterised by the export and import of commodities such as cereals, meat, and horticultural items; North America is a significant net exporter in this domain. This trade is affected by currency fluctuations and domestic policies that influence production volumes and exports. Agricultural trade is one of the key components of international trade, encompassing the exchange of raw and processed agricultural goods between countries. Its importance is particularly evident in developing countries, as it is directly linked to achieving food security, generating foreign exchange and increasing employment rates, as well as its role in supporting domestic production through integration into global markets and securing a financial surplus from foreign currencies (Abd& Al-Badri: 2024: 486-492)

Agricultural trade is a comprehensive concept that encompasses all activities associated with the production, processing, and distribution of agricultural products, from the farm to the end consumer. It is applicable to both local and global markets. The international exchange of horticultural products, meat, and cereals, as well as logistics services, food processing, distribution, and the retail trade in agricultural products, are all examples of agricultural trade. Agricultural trade is a critical economic driver, a foundation of national stability, and a primary source of rural development.

Based on the above concepts, we can conclude that the importance of agricultural trade lies in its contribution to:

- **Economic activity:** capable of substantially contributing to global GDP, generating employment in developing nations, and underpinning export revenues.
- **Food security:** It can help ensure that food is available in sufficient quantities and at affordable prices.
- **Rural development:** seeks to generate jobs and development in rural areas, and helps stable trade flows

The key components of agricultural trade can be summarised as follows -:(Al-Faisal & Al-Saadi: 2024: 697)

- **Crop and livestock production**: This is the main activity undertaken by farmers, involving the cultivation of crops and the rearing of livestock .
- **Input suppliers:** These encompass firms that provide seeds, fertilisers, agricultural chemicals, and equipment, all of which enhance the agricultural production process and its quality .
- **Manufacturers and suppliers:** These organisations are responsible for the transformation of raw agricultural products into food products, including livestock packaging and food processing.
- **Traders and distributors:** As intermediaries, they are responsible for transporting agricultural products from farmers to wholesalers and retail stores, whether the transportation takes place locally or internationally.

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- **Retailers:** They are the traders who own small companies and shops through which they sell those final products directly to consumers in supermarkets or farmers' markets .

2. The balance of trade and its importance : The trade balance represents the disparity between the value of exports and imports during a designated timeframeTrade surplus means that the exports are larger than the imports. If the country imports more than it exports it is called a trade deficit. When exports are more than imports a trade surplus is created. When a country is importing more than it is exporting a trade deficit is created. The agricultural trade balance is an important indicator of the ability of a country to satisfy its food needs from domestic production or through dependence on imports (Blavasciunaite: 2020: 54) Some specialists have defined the trade balance as a statistical statement that shows whether the value of a country's exports (goods and services produced locally and sold to other countries) exceeds the value of its imports (goods and services imported from abroad) (Nga: 2020: 21-35) It denotes the disparity between the value of a nation's exports and the value of its imports of goods and services during a defined timeframe. Its significance resides in serving as a crucial indicator of economic vitality, fostering sustainable development, diminishing economic dependencies, and bolstering local industry. It also influences investor confidence, economic growth, GDP, foreign currency reserves, and exchange rates. (Aulia et al: 2024: 275)

The importance of the trade balance lies in the following:(Shahid et al: 2022)

- **The main economic indicator:** It is considered an important indicator for assessing the performance of the economy and its ability to compete in global trade, and thus it represents an essential part of the balance of payments.
- **Promoting sustainable development:** A balanced trade balance can be linked to the economic health of the country, which enhances investor confidence and contributes to long-term economic growth.
- **Reducing economic dependencies:** Balancing the trade balance can help reduce countries' reliance on imports, thereby decreasing exposure to external economic shocks, such as currency fluctuations or geopolitical crises. (Moyo & Garidzirai: 2022: 501)
- **Supporting local industry and employment:** A stable trade balance can contribute opportunities for both the local and international markets, supporting local industry, driving innovation, and creating job opportunities.
- **Determining foreign exchange reserves:** The trade balance determines the inflows and outflows of foreign exchange, which directly affects the size of the country's cash reserves. (Ali et al: 2015: 27)
- **The impact on Gross Domestic Product (GDP):** The trade balance can contribute to the calculation of a country's GDP, where the value of exports is added and the value of imports is subtracted, through which we can obtain the net domestic product.
- **Determining exchange rates:** The exchange rate plays a significant role in determining foreign currency exchange rates, as financial surpluses from foreign currencies and trade deficits can affect the supply and demand for currencies. (Thomas: 2019: 334)

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3. Economic growth : Economic growth refers to the augmentation of goods and services production within a nation's economy over a designated timeframe, primarily assessed through Gross Domestic Product (GDP) or Gross National Product (GNP). This growth is a significant indicator as it results in elevated living standards, the generation of new employment opportunities, and the enhancement of national income. Economic growth is typically assessed in real terms, signifying the exclusion of inflation's effects, to yield a more precise representation of the rise in production volume (Xepapadeas: 2005:1221)

Economic growth occurs in response to an increase in the production of capital goods, technology, or human capital, and generally corresponds with an increase in national income.

The term "economic growth" refers to the increase in the flow of economic productivity in a particular nation, which is achieved through the rise in the production of goods and services over a particular time period, excluding the effects of economic inflation ‹Economic growth enhances corporate profits via the appreciation of financial stocks; this subsequently stimulates increased investments and heightened demand for labour, thereby contributing to a reduction in unemployment rates, an elevation in individual income levels, and an improvement in living standards. This leads to heightened demand for goods and services by individuals; thus, the rise in individual expenditure propels economic growth to elevated levels (Acemoglu:2012: 547)

Economic growth is the continuous increase in real GDP, often measured by the annual change rate. Agricultural trade contributes to stimulating growth through: (McCombie & Roberts: 2002:90)

- Increasing agricultural exports and the foreign currency revenues they generate.
- Importing improved production inputs that increase the productivity of the agricultural sector.
- Enhancing local added value through food industries.

Economic growth can be quantified through various methods, with real GDP being one of the most prevalent measures employed to assess it ‹GDP can be defined as the total value of all goods and services produced within the local economy, while real GDP is the GDP adjusted to exclude the effects of inflation. Among the most commonly used methods to measure economic growth are the following :(Gollin: 2010: 3825-3866)

- **Quarterly annual growth rate :**This method explains the fluctuations in GDP on a quarterly basis, comparing and summing them, and then recording them at the end of the year. It is noted that the media use this method to show economic changes and developments. However, one of the drawbacks of this method is that it highlights changes resulting from economic factors during the quarterly period, which affects the overall annual rate .
- **Quarterly growth rate :**This method juxtaposes the GDP level of each quarter with that of the corresponding quarter in the preceding year, enabling companies to ascertain their annual profits and mitigate seasonal variances .
- **Average annual growth rate:** This method is considered to be less volatile than other methods because it eliminates changes that are the result of factors that affect economic growth. Additionally, there is a complete comparison of developments and changes that occurred over the course of the previous year.

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The importance of economic growth: Most developmental studies conducted on some developing countries in the field of agricultural trade indicate that economic growth is the best way to eliminate poverty and achieve a better standard of living. An increase in income levels by 10% leads to a reduction in the poverty rate by 20-30%. Economic growth has many goals, including the following: (Awokuse:2015: 78-96)

- **Mitigating poverty:** Economic growth swiftly and efficiently elevates individual average income, resulting in a decrease in poverty levels. Research conducted in 14 countries during the 1990s demonstrated that poverty levels in eleven countries declined by 1.7% with a 1% rise in average income per capita .
- **Reshaping society:** Economic growth enhances the income level of individuals through income distribution. The higher the dispersion measure of income distribution, the lower the poverty level, with the necessity of not linking growth to equality in income distribution .
- **Job creation:** Economic growth is a process that involves the creation of job opportunities. This is achieved by increasing the demand for labour, which in turn reduces poverty, balances economic restructuring processes and manufacturing industries, and enhances productivity levels .
- **Advancing human progress :**not only in terms of material goods, but also by enhancing the quality of life for individuals through the provision of better living opportunities, such as the enhancement of health and education levels, as well as by working to add investment incentives through increased government spending and simultaneously waiting for the returns of this spending in the future .
- **Development of health and education:** The increase in income levels resulting from economic growth helps improve the health services provided to individuals. Education is also affected by the rise in income levels, as evidenced by the increase in the number of students enrolling in schools and universities, which in turn can enhance income levels.

4. Impact of Agricultural Trade Channels: It is evident that significant channels influence agricultural trade. Their scope encompasses various elements, including economic factors related to growth, poverty rates, and food prices, alongside environmental and climatic influences that affect trade patterns .In addition, the policies of the government play a significant role because they influence the flow of trade as well as supply and demand. Additionally, trade is a contributor to the exchange of technologies, the improvement of productivity, and the innovation of supply chain processes. Furthermore, it has an effect on the availability, diversity, and quality of agricultural products, which in turn creates challenges and opportunities in the areas of food security and nutrition (Obed et al: 2025)

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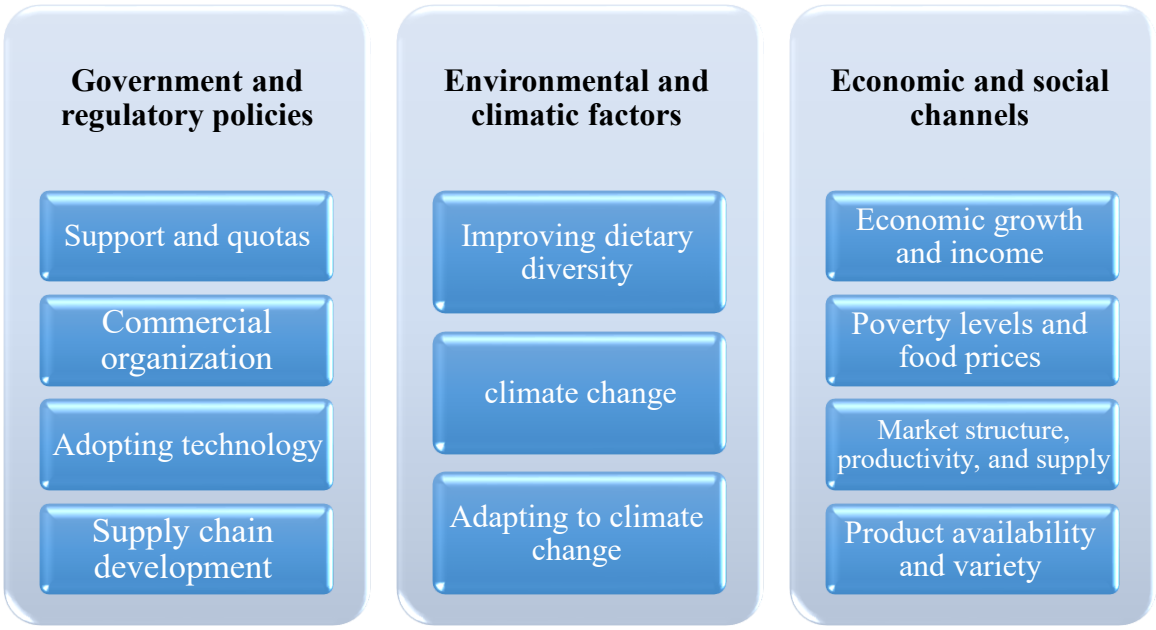
Figure 1 illustrates the main channels of agricultural trade.



Source: Prepared by the researcher, 2025.

The major channels that influence growth and income are depicted in the figure that is located above. This is especially true for developing nations that have the potential to increase their agricultural exports. Furthermore, trade has the potential to enhance the income of individuals with low incomes and further contribute to the reduction of poverty, while the prices of food have a significant impact on the state of food security .This trade fosters competition and enhances productivity by promoting investment and innovation in technology, research, and development. Trade enhances the quantity and variety of accessible food, offering consumers a broader range of options. Environmental and climatic factors influence the relative advantages among countries and alter trade patterns, thereby impacting the value of agricultural food exports. Consequently, trade can serve as a strategy for adaptation by reallocating surplus food supplies to regions facing shortages .And this is done through government and regulatory policies, as these government policies such as subsidies, price ceilings, and import quotas affect the equilibrium points of supply and demand, and can mitigate the risks of "dumping" (selling goods below their market value). They also play a role in addressing nutrition goals within changing global food systems .

Trade facilitates the dissemination of modern technologies, enhances productivity and lowers the cost of agricultural inputs. It also aims at establishing supply chains in trade and promoting changes that improve agricultural supply chains, which constitute an important part of food supplies in many countries and have a direct impact on food security. Trade also helps raise the diversity and quality of food products, which is good for nutrition.

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5.Previous studies: In this section, we review the most prominent Arab and foreign studies related to the research topic, in order to position the current study within the research context and identify the gap it seeks to fill, as shown in the following table: Previous studies: In this section, we review the most prominent Arab and foreign studies related to the research topic, in order to determine the position of the current study within the research context and to identify the gap it seeks to fill, as shown in the following table:

Table 1. It shows the previous studies.

NO.	Researchers	Year of study	Subject of study	Key findings
1	Baek & Koo	2008	Identifying macroeconomic linkages to US agricultural trade balance.	The results show that in the long term, the exchange rate, agricultural price, and externally available income are weak in the American agricultural sector and have significant effects on the trade balance. The combined short-term dynamic effects of the exchange rate, agricultural price, production, and disposable income jointly explain the changes in the trade balance.
2	Ouma et al	2016	Agricultural trade and economic growth in East African Community.	The experimental results exhibited varied outcomes for the different member nations of the East African Community. In Kenya, there existed a bidirectional relationship between agricultural exports and economic growth, while Rwanda exhibited a unidirectional relationship; conversely, Burundi, Tanzania, and Uganda demonstrated no relationship whatsoever.
3	Jubair & Alhiyali	2018	An economic study of the impact of foreign agricultural trade and some macroeconomic variables on the exchange rate in Iraq using the FMOLS model for the period (1990-2015).	The research reached several conclusions, the most important of which is the lack of impact of both agricultural exports and interest rates on the exchange rate, while agricultural imports, the inflation rate, and GDP significantly affected exchange rate fluctuations.
4	Blavasciunaite et al	2020	Trade balance effects on economic growth: Evidence from European Union Countries.	Additionally, the potential for a nonlinear effect was identified, which may suggest that a stronger negative impact on economic growth may occur when the trade balance deteriorates in the presence of a substantial trade deficit. Other factors, such as the size and

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NO.	Researchers	Year of study	Subject of study	Key findings
				persistence of the deficit, should be taken into account when discussing trends for future research.
5	Ghahremanzadeh et al	2022	The effect of exchange rate fluctuations on Iran's agricultural trade balance.	The results also showed that the real exchange rate fluctuations had a significant negative effect on the agricultural trade balance in the long run, but no significant effect in the short run.
6	Al-Faisal & Al-Saadi	2024	Mechanism for Correcting the Imbalance in the Agricultural Trade Balance and the Relationship with Economic growth in Iraq for the period (2000-2022).	The study found that the trade balance suffers from chronic imbalances that have weakened its impact on economic growth in Iraq.
7	Ahmed & Almosabbeh	2024	An Economic Analysis of The Role Of Agricultural Foreign Trade And Exchang Rates In The Growth Of Agricultural Output In Iraq (1990-2020).	The findings demonstrate a long-term equilibrium relationship between agricultural and local products and the examined variables. A negative correlation existed between agricultural imports and output during each period.
8	Abd & Al-Badri	2024	An Economic Analysis of impact of the exchange rate on agricultural trade balance in Iraq for the period 2003-2022.	I discovered a positive relationship between the exchange rate and the agricultural trade balance gap in the short term, but an inverse relationship in the long term. The diversification of foreign trade and export sources in Iraq is underscored by the adoption of an exchange rate policy, which contributes to an increase in foreign trade.

Source: Prepared by the researcher 2025.

It appears from the theoretical presentation and previous studies that agricultural trade directly and indirectly affects both the trade balance and economic growth .The extent of this impact fluctuates based on the configuration of the agricultural economy and the policies enacted. Consequently, assessing the effects of agricultural trade within the Iraqi or Arab context can facilitate the formulation of pragmatic policies designed to enhance the trade balance and attain sustainable economic growth.

It can also be said that increased value added agricultural exports can be a catalyst for growth in agricultural trade. Moreover, over-dependence on imported food strains the trade balance and makes the economy vulnerable to global price shocks. The effectiveness of agricultural trade is associated with the existence of supportive policies that include improving agricultural infrastructure and supporting local producers.

The practical and analytical aspect

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This section addresses the empirical analysis of the relationship between agricultural trade and the trade balance ، This analysis examines the growth of real GDP in the pertinent countries from 2010 to 2023, aiming to evaluate the influence of agricultural exports and imports, as well as the extent of agricultural openness, on the agricultural balance and economic growth, thereby assessing the disparities between countries and across short-term and long-term periods .

Table 2. The value of agricultural imports, exports, and trade balance

(Thousand US dollars) during the period 2015-2022

Year	Details	iraq	Egypt	Morocco
2015	Imports	2566425	958523	418137
	Exports	114474	5519619	784025
	agricultural trade balance	**-2451951**	**4561096**	**365888**
2016	Imports	2164211	1129655	487600
	Exports	120748	5250197	847049
	agricultural trade balance	**-2043463**	**4120542**	**359449**
2017	Imports	1872256	802571	504486
	Exports	173172	4580167	843151
	agricultural trade balance	**-1699084**	**3777596**	**338665**
2018	Imports	4010803	1336811	767657
	Exports	88504	4753579	1044487
	agricultural trade balance	**-3922299**	**3416768**	**276830**
2019	Imports	2936314	1291937	700500
	Exports	53782	4697177	1117719
	agricultural trade balance	**-2882532**	**3405240**	**417219**
2020	Imports	3436403	1425707	727407
	Exports	661826	5044684	1062122

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	agricultural trade balance	**-2774577**	**3618977**	**334715**
2021	Imports	2936314	1291937	700500
	Exports	53782	4697177	1117719
	agricultural trade balance	**-2882532**	**3405240**	**417219**
2022	Imports	2996688	1241911	1079318
	Exports	90278	5342430	1182270
	agricultural trade balance	**-2906410**	**4100519**	**102952**

Source: Prepared by the researcher 2025.

The table above shows us the value of imports and exports for the agricultural trade of third countries, as well as a review of the agricultural trade balance for them.

Iraq's average annual imports totalled 2,854.7 million, while average annual exports amounted to 186.1 million, resulting in an average annual balance of 2,668.6 million, indicating an average annual deficit .Where the total balance (2015–2022) was -18,680.3 million (approximately -18.7 billion total deficit for the period) the subject of the study, and the export-to-import ratio (period average) was 0.065 (meaning every dollar exported corresponds to approximately 15.3 dollars imported).

Although agricultural trade in Egypt attained commendable levels, resulting in an overall surplus during the specified period, the average annual imports amounted to 1,169.6 million, whereas the average annual exports totalled 5,026.8 million. The mean annual balance was 3,857.3 million (mean annual surplus) .As for the total balance (2015–2022), it was 27,000.7 million (27.0 billion surplus for the period), and the export-to-import ratio reached 4.30. This is a strong indicator that Egypt is considered a very strong agricultural exporter compared to its imports.

In the Kingdom of Morocco, the average annual imports amounted to 673.2 million, while the average annual exports amounted to 999.8 million. There was an average annual surplus of 326.6 million dollars, which was the average annual balance ،The cumulative balance from 2015 to 2022 was +2,612.9 million (2.61 billion surplus), with an export-to-import ratio of 1.49.

Where we can reach a clear explanation through which Iraq reflected a clear negative image represented by a large, continuous, and also sustainable agricultural deficit in the agricultural trade balance throughout the period, with an annual average of -2.67 billion dollars per year ،This signifies that Iraq's agricultural economy predominantly relies on substantial imports (feed, food, inputs) while exhibiting limited export capability, thereby rendering the nation vulnerable to balance of payments and exchange rate pressures.

As for the Arab Republic of Egypt, it has achieved a strong and stable agricultural surplus, which is considered relatively good and large, with an average annual surplus of $3.86 billion per year. Egypt’s agricultural exports have been high and

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stable, ranging between $4.5–$5.3 billion annually in most years, making it a regional exporting player (vegetables, fruits, processed products) .This demonstrates that there is a variation in exports on an annual basis, but it is not as severe as it is in Iraq. This suggests that there is a robust and competitive export chain or export categories that have added value. It can be deduced from this that Egypt's policy benefits from agricultural added value and competitive exports. Therefore, it is logically recommended to strengthen logistical and export support policies and invest in value chains in order to consolidate this advantage.

Morocco exhibits a persistent surplus, albeit significantly smaller than that of Egypt. Morocco attains a moderate annual agricultural surplus, averaging $327 million, through substantial export growth, increasing from $784 million to $1,182 million between 2015 and 2022, although certain years exhibit fluctuations, such as 2018, which experienced a spike in imports. This signifies Morocco's significance as an export hub for fruits and vegetables; however, seasonal and meteorological factors may result in annual fluctuations.

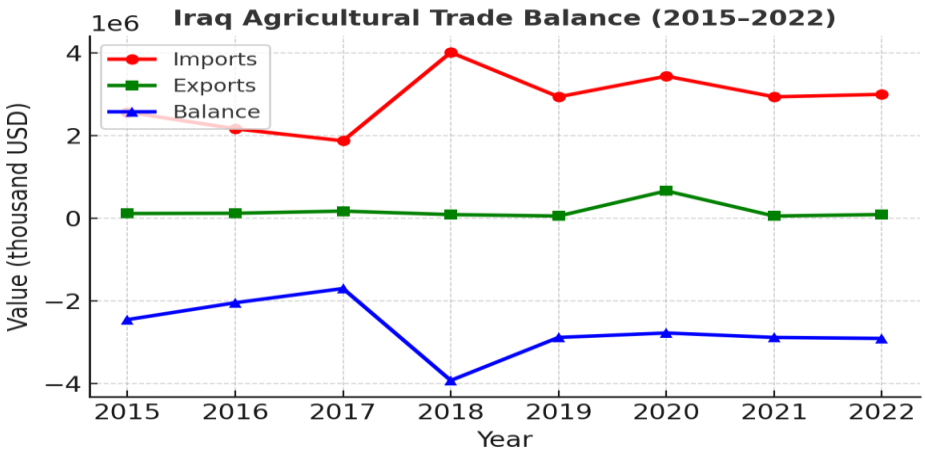

Figure 2. Graph showing the value of imports, exports, and the agricultural trade balance in Iraq for the period 2015-2022

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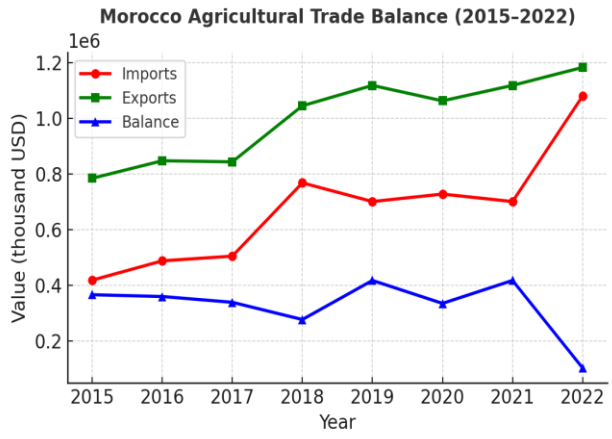

Figure 4. Graph showing the value of imports, exports, and the agricultural trade balance in Morocco for the period 2015-2022

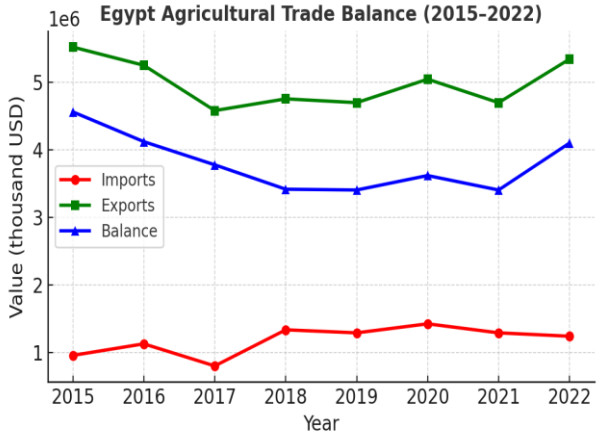

Figure 3. Graph showing the value of imports, exports, and the agricultural trade balance in Egypt for the period 2015-2022

Source: Prepared by the researcher, 2025.

The graphs above distinctly illustrate that Iraq experiences a significant and enduring disparity between imports and exports, leading to a chronic and continuous deficit ، Egypt, on the other hand, has successful agricultural exports that are significantly higher than its imports, which results in a continuous surplus of agricultural products. On the other hand, Morocco is able to achieve a moderate surplus because its exports are slightly higher than its imports. This allows Morocco to achieve a moderate surplus.

Based on the data and statistics obtained from the table and graphs above, a Granger regression and causality test was conducted, with the following results:

In Iraq, the results are as follows :

Regression (OLS): Balance = (1 × Exports) – (1 × Imports) + Constant ≈ 0

$R^2 = 1.00$

Granger:

Exports → Balance: p = {lag1: 0.711, lag2: 0.934} (not significant)

Imports → Balance: p = {lag1: 0.711, lag2: 0.934} (not significant)

Explanation: There is no independent temporal causal link (because the balance of payments is derived from exports and imports).

However, in Egypt it was:

Regression (OLS): Balance = (1 × Exports) – (1 × Imports)

$R^2 = 1.00$

Granger:

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Thi-Qar Journal of agricultural research
ISSN Onlin:2708 -9347, ISSN Print: 2708 -9339 Volume 14, Issue 2 (2025)
https://iasj.rdd.edu.iq/journals/journal https://doi.org/10.54174/utjagr.v13ii 231.

Exports → Balance: p = {lag1: 0.353, lag2: 0.000} (significant at lag = 2)

Imports → Balance: p = {lag1: 0.353, lag2: 0.000} (significant at lag = 2)

Interpretation: Changes in Egypt's exports/imports may precede changes in the balance of payments by two periods (two years), which could indicate a real time dynamic (perhaps due to long-term export contracts or support policies that take effect later).

The results of the tests in Morocco had reached

Regression (OLS): Balance = (1 × Exports) – (1 × Imports)

$R^2 = 1.00$

Granger:

Exports → Balance: p = {lag1: 0.757, lag2: 0.770} (not significant)

Imports → Balance: p = {lag1: 0.757, lag2: 0.770} (not significant)

Interpretation: There is no evidence of a temporal causal relationship between imports/exports and changes in the agricultural balance during the period (the effect is immediate and direct).

From this, we can infer that the regression rate substantiates that the agricultural trade balance is effectively represented by exports minus imports (coefficients of 1 and -1). Furthermore, Granger causality indicates that Egypt exhibits a temporal causal relationship with a lag of 2, meaning alterations in exports and imports influence the balance after approximately two years. In contrast, no independent causal relationship was observed in Iraq and Morocco, where the effects are immediate and solely calculated.

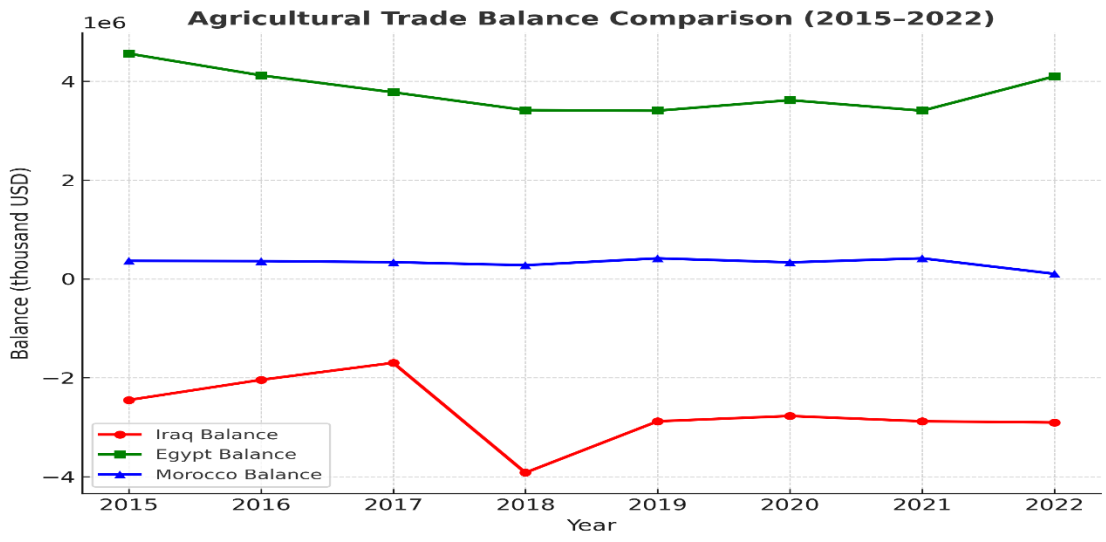

Figure 5. Comparison illustrating the differences in the agricultural trade balance between Iraq, Egypt, and Morocco .(2022–2015)

Source: Prepared by the researcher, 2025.

Discussion of the hypotheses:

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Thi-Qar Journal of agricultural research
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https://iasj.rdd.edu.iq/journals/journal https://doi.org/10.54174/utjagr.v13ii 231.

Hypothesis 1 (H1): Agricultural exports have a positive and significant impact on the trade balance.

The Granger causality test conducted at a lag period of two showed that changes in agricultural exports precede and significantly affect changes in the agricultural trade balance. The findings of this test demonstrated that this hypothesis is indeed applicable to Egypt .In Morocco, data indicated a moderate agricultural trade surplus; however, causality tests failed to establish a definitive temporal causal relationship, suggesting that the effect is immediate and direct without prolonged temporal dynamics. No causal relationship was identified between exports and the trade balance in Iraq, indicating a limited agricultural export capacity and an economy reliant on imports. The initial hypothesis is substantiated in Egypt, tenuous in Morocco, and refuted in Iraq.

Second hypothesis (H2): Agricultural imports have a negative impact on the trade balance in the short term, and may have an indirect positive impact if they are used as inputs for production.

The analysis showed that Iraq suffers from a chronic deficit in the agricultural trade balance due to high imports and low exports, which confirms the direct negative impact of imports on the balance .Furthermore, despite the fact that Egypt imports a significant quantity of agricultural products, these imports are frequently utilised as production inputs, which contribute to the enhancement of export capacity and ultimately result in an increasing trade surplus. Because exports continued to be slightly higher than imports, Morocco was able to achieve a moderate surplus, which meant that the negative impact of imports was limited overall. The second hypothesis is therefore supported in Iraq to a significant degree, while it is supported to a lesser extent in Egypt and Morocco.

Third hypothesis (H3): Agricultural trade liberalization has a positive effect on the real output growth rate.

The indirectly acquired indicators corroborate this hypothesis. Egypt realises tangible GDP advantages by bolstering its agricultural sector and enhancing its competitiveness in global markets, owing to its robust agricultural export capacity and substantial surplus. There is also a limited positive impact that Morocco achieves due to the fact that it has a small agricultural surplus. The continuation of the agricultural trade deficit in Iraq has the effect of lowering the contribution of agricultural trade to the growth of the real GDP. Consequently, the third hypothesis is initially supported in Egypt and Morocco, but it is not supported at all in Iraq until later.

Fourth hypothesis (H4): There is a causal relationship from agricultural trade to the trade balance and growth, stronger than the inverse relationship.

The results from Egypt unequivocally validated this hypothesis, as the Granger test indicated that fluctuations in exports and imports precede alterations in the trade balance by a specific interval ‹In Iraq and Morocco, however, the results showed no significant causal relationship, indicating that the impact of agricultural trade there remains momentary and does not create a sustained economic dynamic. Therefore, the fourth hypothesis is only supported in Egypt.

Finally, the comparison between the three countries shows that the studied hypotheses are realized to varying degrees, as they appeared stronger and clearer in Egypt, where agricultural trade played a pivotal role in boosting the trade balance and economic growth .Morocco exhibited moderately robust outcomes with a modest trade surplus and an absence of

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https://iasj.rdd.edu.iq/journals/journal https://doi.org/10.54174/utjagr.v13ii 231.

causal dynamics, whereas Iraq's subpar performance stemmed from a persistent deficit in the agricultural trade balance and inadequate export capacity.

Table 3. Testing the results of the hypotheses

Hypothesis	iraq	Egypt	Morocco
Impact of Exports on the Balance	Unsupported	Supported	weak
Impact of imports on the balance	Supported	Supported partially	Supported partially
The impact of trade on growth	weak	Supported	Supported partially
Causality	Unsupported	Supported	Unsupported

Source: Prepared by the researcher, 2025.

Conclusions and Recommendations:

Conclusions

1. Iraq: It suffered from a chronic agricultural trade deficit during the period (2015–2022) due to high imports and weak exports. No significant causal relationship was found between agricultural exports and the trade balance, reflecting weak production and export infrastructure. The heavy reliance on agricultural imports weakens domestic agricultural economic growth.

2. Egypt: attains a substantial and sustainable agricultural surplus, bolstered by robust export capabilities and the utilisation of imports as production inputs. Causality tests indicated that agricultural exports significantly influence the trade balance (lag=2), thereby contributing to stable trade performance. The agricultural sector in Egypt directly enhances economic growth and improves the trade balance.

3. Morocco: It achieves a moderate agricultural trade surplus, with exports narrowly exceeding imports. The analysis did not establish a dynamic causal relationship, meaning that agricultural performance is relatively stable but not strong in the long term. Morocco relies on improving the competitiveness of its exports to maintain its agricultural surplus.

4. Comparing the three countries: Egypt represents the strongest model in investing in agricultural trade to enhance the trade balance and economic growth, Morocco is in an average position, while Iraq suffers from major structural imbalances that limit its ability to achieve agricultural trade sustainability.

Recommendations

1. For Iraq: Implement strategies to diminish reliance on agricultural imports by fostering local production and promoting food industries, stimulate investment in agricultural infrastructure (irrigation, seeds, modern technologies) to enhance productivity, and establish initiatives to boost agricultural exports through tax incentives and logistical assistance.

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https://iasj.rdd.edu.iq/journals/journal https://doi.org/10.54174/utjagr.v13ii 231.

2. For Egypt: Continue supporting agricultural exports and enhancing quality to expand foreign markets, and encourage increased investment in agricultural value chains to raise economic returns. Work to diversify the export base to mitigate risks arising from global price volatility.

3. For Morocco: Efforts should focus on enhancing the competitiveness of agricultural exports through agricultural innovation, improved product quality, and better water resource management to increase the sustainability of agricultural production. Furthermore, export markets must be diversified to reduce reliance on a limited number of trading partners.

4.This is accomplished at the regional level by enhancing agricultural and trade collaboration among Arab nations through trade agreements and the exchange of expertise, as well as by instituting joint food security initiatives designed to promote integration and mitigate deficits in certain countries.

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