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Analysis of the impact of agriculture goods dumping in Iraq using ARDL methodology

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Abstract: The research highlights the need to develop effective protectionist economic policies to mitigate the negative effects of dumping, stimulate local production, and enhance food security. By addressing the dumping problem through policy interventions, Iraq can work to revive its agricultural sector, reduce dependence on imports, and promote sustainable economic growth. This research aims to study the impact of dumping on the agricultural sector in Iraq, by analyzing the relationship between agricultural output and both agricultural goods imports and food imports for the period from 2000 to 2020. The Autoregressive Distributed Lag (ARDL) methodology was used to analyze annual data and determine the short- and long-term effects of imports on agricultural output. The results showed a statistically significant long-term impact of food imports on agricultural goods, indicating that an increase in food imports is associated with an increase in agricultural goods. While agricultural imports did not show a statistically significant impact on agricultural goods. These results indicate that import dumping, especially in food products, contributed to the weakening of the ability of local agricultural producers to compete, leading to foreign monopoly in the market and a decline in local production.

Keywords: *ARDL methodology, agriculture goods dumping, enhance food security, protectionist economic policies.*

1. Introduction

As a result of the ill-considered policies to liberalize the Iraqi market after 2003, the phenomenon of dumping worsened and became a major challenge to competition from foreign goods, especially agricultural goods and food (Daadoush and Al-Omari, 2022). The decline in domestic production due to the influx of cheap foreign goods led to a significant decrease in competitiveness, leading to a weakening of the overall economy due to the gradual replacement of local goods with foreign goods (Deardorff & Stern, 2005). The replacement of foreign goods with local ones had a negative impact not only on the agricultural sector but also included many sectors in the Iraqi economy (Kim & Roh, 2022).

The country's dependence on imported goods has caused paralysis in important sectors, a general weakness in production, and widespread unemployment. This is particularly worrying in light of the steady population growth, as Iraq's population increases by about 900,000 people per year (Blonigen & Prusa, 2016). To increase local production and revive and ensure economic stability, broad programs, and policies are required that include complete protection of industry through regulating imports and working to set future goals that seek self-sufficiency and address dumping (Cheng et al., 2001). Increasing dependence on imported goods poses a risk to the economy the longer it lasts, as the country's dependence on cheaper foreign goods causes, in the first stage, the inability to compete, the closure of projects and the increase in unemployment. In the subsequent stages, the general economy weakens through low investment, slow growth, long-term inflation and high costs (M. Janabi, 2018). The importance of the study lies in diagnosing the harmful effects of dumping on the economy over the past twenty years. Dumping has led to weak competition, a decline in the quality of locally produced goods, and the closure of a large percentage of agricultural and industrial projects. In addition to

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material issues such as poor infrastructure, weak policies have exacerbated the problem (Mehdi et al., 2020; Prusa, 2001; Zanardi, 2004). This research aims to diagnose the negative effects of dumping that have affected the Iraqi economy in recent years, and to attempt to determine the necessary policies to treat this phenomenon.

This study uses quantitative and qualitative analysis methods, using data from 2000-2020. The data is analyzed to identify trends in dumping practices and how they affect the agricultural sector in Iraq. The data used were from official organizations concerned with agriculture, such as the Food and Agriculture Organization (FAO), statistics from the Iraqi Ministry of Planning, and reports from the Iraqi Ministry of Agriculture. This data provides a comprehensive picture of production, consumption, and imports, and it is also possible to identify the food gap and the size of the problem represented by the amount of imports from 2000 to 2020. The results of this study would enable researchers in the field of economics, specifically agricultural economics, to have empirical evidence of the impact of import dumping on agricultural production. Methodologically, this study is a contribution to the existing literature in the field of agricultural economics using the ARDL methodology to consider the relationship between import dumping and the production side. The study includes independent variables such as imports (as an indicator of dumping), local prices, and international prices, while the dependent variable is local agricultural production.

2. Literature Review

One of the biggest challenges facing developing countries is the phenomenon of dumping, perhaps due to the lack of effective policies or the weakness of management to design and get out of this predicament. The review of studies aims to understand the essential theses in this field that have taken the subject of dumping from different points of view. A study investigated the adverse effects of market liberalization on industrial productivity in Iraq. In the role of economic policies followed in production, the study found that trade liberalization can enhance production if appropriately implemented; at the same time, protective measures are taken for the local product to prevent dumping. (Deardorff & Stern, 2005).

Studies by official institutions such as the World Bank and the Iraqi Ministry of Finance have confirmed the impact of agricultural policies on production and imports in Iraq after 2003. Effective policies lead to improved production, which enhances food security and addresses unemployment. In another note to the report, it also indicated that the deterioration of infrastructure is a major factor contributing to the poor performance of the agricultural sector and low production. Among the recommendations were the need for international support and concerted government efforts to overcome the challenges facing this sector (World Bank, 2008). As for the report of the Iraqi Ministry of Finance, it confirmed that economic policies affect the allocation of resources within Iraqi families. Good policies help to promote health and nutrition and reduce crime rates, which enhances social and economic benefits. (Ministry of Finance -Department of Economic Policies, 2012).

The impact of development on the economy as a whole and the potential benefits of improving the agricultural sector in Iraq have been the focus of many studies. One of these studies delved into increasing production, which could address poverty and improve living standards. In addition, the benefits of agriculture extend to other aspects, such as the environment, health, and other social dimensions (Boyden & Dercon, 2012). There is a noticeable impact in developing countries when implementing agricultural development programs and how they affect multiple aspects. The focus should be on policies that support the activation of this sector, such as technology, investments, and policies that support increasing production and reducing imports (Breisinger et al., 2012). The impacts of agricultural policies on economic growth and employment in Iraq have been thoroughly explored. Developing the agricultural sector can substantially improve income distribution and reduce poverty. Enhanced agricultural productivity not only increases agricultural income but also strengthens national food security, highlighting the crucial role of the agricultural sector in Iraq's economic development (Haboby et al., 2014).

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Studies conducted by the Food and Agriculture Organization reviewed the status of the agricultural sector in that achieving agricultural objectives contributes significantly to diversifying sources of income and moving away from Iraq's dependence on oil as the sole source of income. Agricultural development plans, according to the approach of the Iraqi Ministry of Planning, emphasized moving in this direction and activating the role of agricultural and then economic development (Republic of Iraq Ministry of Planning, 2013). Another study reviewed the status of Iraqi infrastructure and the security situation and their impact on production and development. The study recommended that improving infrastructure, improving the security situation and new policies would reduce the food gap and increase production (FAO, 2017). The study also found that introducing technology in agricultural inputs such as modern irrigation systems, improved seeds and other materials would increase production and push towards development (FAO, 2020).

Government support through agricultural guidance, loan facilities, and high-tech inputs contributes significantly to increasing production, a study conducted in 2021 found that support reduces dependence on imports (Mahmud, 2021). Reviewing previous studies helps provide a comprehensive view of the agricultural sector and understanding development and impacts on the quantity of imports and low production.

3. Evolution of Trade and Tariff Policies and the Effects of Production

Right after the defeat of the Baathist regime, on June 7, 2003, L. Paul Bremer, the administrator of the Coalition Provisional Authority (CPA) (Halchin, 2005). Bremer promulgated the CPA Order No. 12/2003: "Recognizing the central role of international trade in Iraq's recovery and its development of a free-market economy. All tariffs, customs duties, import taxes, licensing fees and similar surcharges for goods entering or leaving Iraq, and all other trade restrictions that may apply to such goods, are suspended until December 31, 2003" (Talmon, 2013). On September 9, 2003, L. Paul Bremer promulgated the imposition of a "Reconstruction Levy" of 5% of the total customs value of goods entering Iraq (CPA Order No. 38). Finally, on February 24, 2004, the CPA declared in Order No. 54 the prolongation of the Order No. 12 of June 7, 2003: "All customs tariffs, duties, import taxes (not including the Reconstruction Levy imposed by CPA Order Number 38), and similar surcharges for goods entering or leaving Iraq are suspended until the sovereign transitional Iraqi administration imposes such charges following the CPA's transfer of full governance authority to that administration" (Talmon, 2013). Iraqi Transitional Government was set up in Mai 2005 and replaced by the first permanent government in 2006. However, it took further four years until Customs Tariff Law No. 22 of 2010 was enacted in order to replace the across-the-board 5% tariff rate labelled reconstruction levy with new tariffs. It was not another four years until the government started, in January 2014, the first phase of implementation of the new customs tariffs. Thus, from 2003 to 2014, the Reconstruction Levy of 5% was a fait accompli the only import duty for all goods entering Iraq, including agricultural products (Norsida, Radam, et al., 2017; A. Rahim & Ali, 2012).

According to the Customs Tariff Law No. 22 of 2010, agricultural import goods were subject to tariffs ranging from 0% for seeds to about 50% for poultry products, tobacco and sugar, also to 80% for water and drinks (FAO, 2020). In January 2018, these tariffs were amended by the Iraq General Commission of Customs (IGCC) according to Resolution No. 393/2017 of the Council of Ministers. Since then, there have been only four rates of customs duty (0.5%, 10%, ,%15 and 30%) for only 21 main important categories of the Harmonized Commodity Description and Coding System of the World Customs Organization. Agricultural products are overwhelmingly earmarked for 10% import duty (M. Janabi, 2018). Although these new tariffs are being applied at the customs, it is still not clear "as of December 2020" if they are permanent. According to §28 of the Iraqi constitution, only the Iraqi parliament is authorized to amend customs tariffs, whereas the above-mentioned resolution of the Council of Ministers was not submitted to the parliament for enactment. It is a common practice of the Council of Ministers to bypass the parliament and wait to see whether the courts will override the measure in question (Hameed, 2019). Figure 1 shows the comparison of tariff rates before and after

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2018. Demonstrates notable reductions in tariff rates across different product categories after 2018. It showcases the effect of the new policy on agricultural production import tariffs in Iraq.

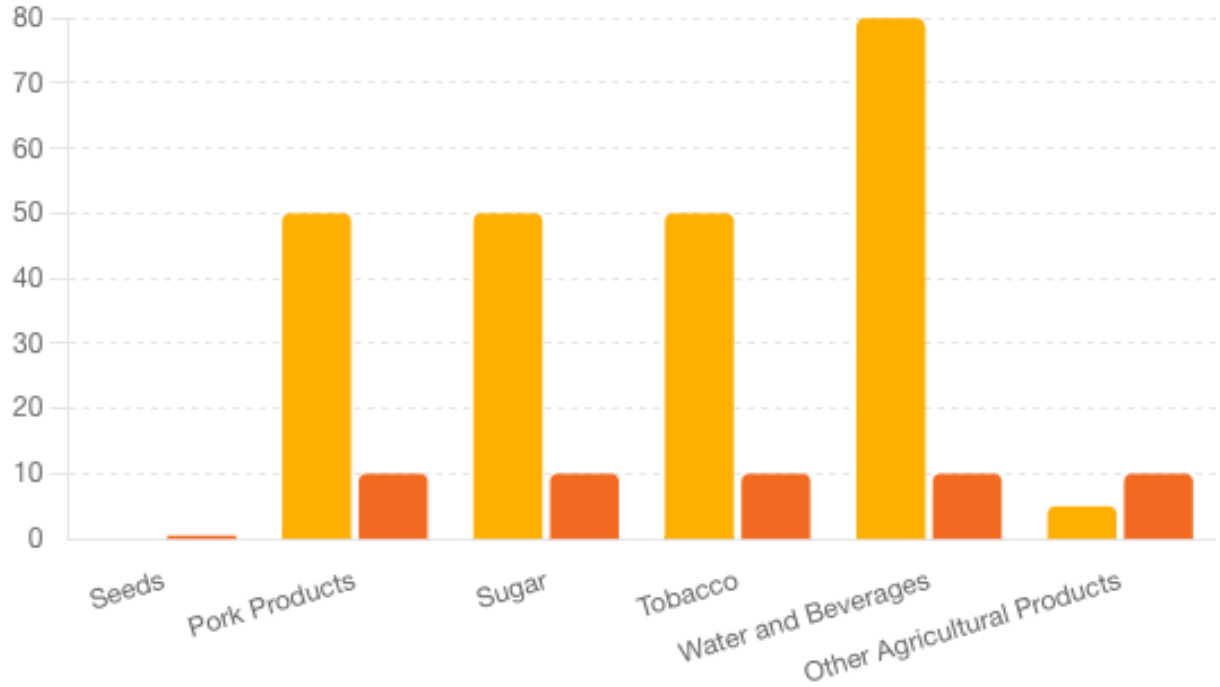

Figure 1.
Comparison of tariff rates before and after 2018 Y: Tariff rate (%), X: Tariff Category, Yellow color Column is the tariff before 2018, Orang color column is the tariff after 2018.
Source: Authors' own elaboration based on Hameed (2019).

Concerning the rather moderate increase in import tariffs since 2014, it is not realistic to expect that they will create effective protection for Iraqi farmers against agricultural imports from Iran, Jordan, and Turkey as the main regional exporters. It should also be noted that a considerable amount of agricultural imports of Iraq are not subject to customs controls due to widespread smuggling and corrupt practices of the customs administrations. The National Development Plan 2018-2022 listed under the heading "Agricultural development challenges" at the third place: "Poor control and monitoring of border outlets that led to increased illegal competition of imported agricultural crops and products with local ones" (Republic of Iraq Ministry of Planning, 2018). The increasing real exchange rate1 of the IQD to USD, and the latent devaluation of the Iranian Rial and Turkish lira, create a permanent source of ruinous competition from these neighboring countries (M. Khaled, 2014).

This currency effect is augmented by dumping practices of exporters from neighboring countries. This has led to the deepening of the principle of market access, trade liberalization, and the reduction of trade barriers, especially those imposed by international agreements and laws (Dadoosh & Alomary, 2022). Consequently, a phenomenon called market dumping has emerged, which involves dumping foreign goods into the market with the goal of achieving profits, dominating certain markets, and overcoming competitors in the long term (Zhou & Percival, 2016). This often results in significant damage to local production, making the policy of dumping a harmful practice that must be combated due

1 In 2004, the CPA issued a new IQD at an initial parity of 4,000 to USD. The currency appreciated until 2012 to parity of around IQD 1,170 to USD and displayed no notable change since then (as of December 2020).

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to the losses it inflicts on local producers and the real threat it poses to domestic production (Showkat, 2024). As evidenced in Figure 2.

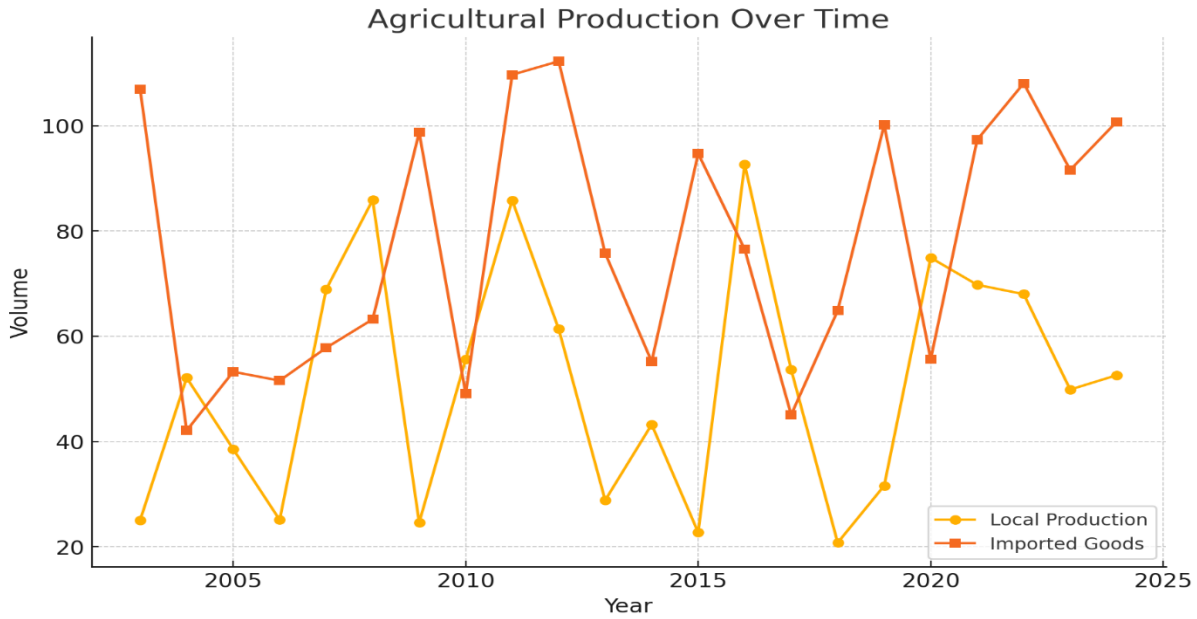

Figure 2.
Agricultural production over time.
Source: Authors' own elaboration based on FAO, (2017 und 2020), M. Janabi (2018), Ministry of Agriculture, (2024).

The cases of chicken, egg, and eggplant imports from Jordan and Turkey (Ghadhban & O. K. Jbara, 2019). The production of chicken in Iraq fluctuated between 53.0 (2010) and 99.6 thousand tons (2014) between 2009 and 2017, whereas chicken imports increased in the same period rather steadily in 2009 from 22.4 thousand tons to 324.8 thousand tons.in 2017 (Ghadhban & O. K. Jbara, 2019). Also, in the cases of egg and eggplant imports, there was a considerable dependency ratio, though not with an increase comparable to chicken imports. The authors calculated dumping margins for chicken imports from Turkey showing that these margins were more than 16% (2011) throughout the period, with more than 100% in seven of those years. In the case of egg imports from Turkey, the minimum dumping margin was 9% in 2011 with more than 100% in five of those years. Eggplant imports from Turkey displayed the highest dumping margins, with a minimum of 37% (2017) and a maximum of 813% (2009). The import of those products from Jordan in the same period displayed permanent and high dumping ratios, although less gloomy than in the case of Turkey (Ghadhban & O. K. Jbara, 2019). As shown in Figure 3 the import and the production of chicken. The trends in chicken production and imports in Iraq from 2009 to 2017. It shows a significant increase in chicken imports compared to the relatively stable and moderate increase in domestic chicken production.

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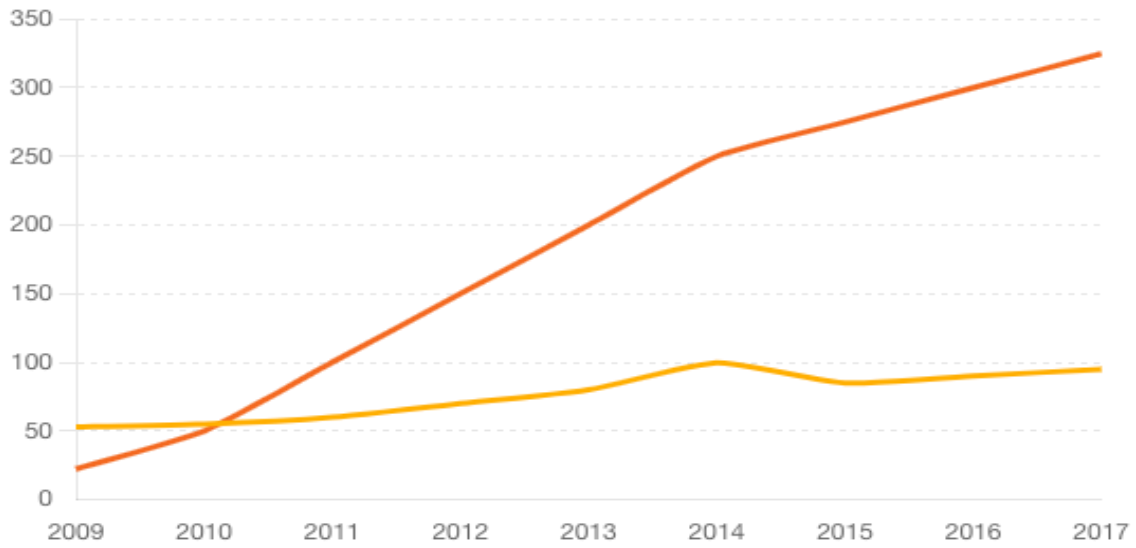

Figure 3.
Chicken production and imports in Iraq (2009-2017) Y: Thousand tons, X: Years, yellow color curve is chicken production, orange color curve chicken import.
Source: Authors' own elaboration based on Ghadhban & Jbara, (2019).

Minimum price support (MPS), import controls and input subsidies are the main instruments of agricultural market regulation ever since the 1950s in Iraq. Prior to 2003, they were integrated into an elaborate system of semi-socialist state agencies that also provided agriculturalists with access to land, credit, inputs, irrigation infrastructure, and cooperative administrations. Since the dismantling of this system, the expectation that removing the state would permit the market and enable private agents to fulfill these functions more efficiently did not happen. Given the destruction of the economy in 2003, the withdrawal of the state was tentative at best resulting in a hybrid system of agricultural markets. On the one side, the old regime of heavy government intervention in markets continued. "In Iraq, the state is involved in every single step of the food value chain. From pre-seeding to placing food on each Iraqi's table, the Iraqi state has impelled government dependency across its population through continuous state intervention and involvement" (Fathallah, 2020). On the other side an open market for agricultural imports was established. What is more, this mishmash of policies is managed by a highly ineffective public administration lacking transparency and accountability, creating a serious constraint to the development of competitive and efficient agricultural markets (World Bank, 2019).

The beginning of the MPS date back to 1972 when Law No. 50 was enacted, leading to the cessation of the private sector's roles in grain trade and the government becoming the sole buyer of grains in Iraq in 1973. In 1979, the General Organization for Agricultural Marketing (GOAM) was established to expand government control to other food markets, such as vegetables, meat, and fruits, by establishing state wholesale markets, storage, and packaging facilities. After 1987, control of vegetable and fruit markets was abolished, and some of the GOAM activities were transferred to the private sector. After a short interruption in 2003, the GBI resumed its quasi-monopoly of grain trade in Iraq by means of MPS for main grains, namely wheat, barley, rice, and corn, which are also components of the Agricultural Distribution System (ADS). Until 2018, even the import of the most strategic grain, namely of wheat, was in the monopoly of the GBI, enabling the state to total market control. Since 2018, private companies are allowed to import some grains, especially wheat, and to process them in private mills and factories. The overwhelming role of the government as a purchaser from the agrarians, importers, processors, and distributor of grains to the consumers is the main factor for market rigidities

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hindering the emergence of a competitive market and a serious constraint for private investment in this subsector (Ibrahim & Abdullah, 2022).

3.1. The Concept of Dumping

Dumping is the business practice of exporting a product in an importing country at a value lesser than the local market value in the exporting country. In essence, it occurs when a country exports a product at a price value lower than its normal value. This standard value can be described as either less than the local selling price, or less than the production costs of the product in the exporting country (WTO, 2023). Another definition of dumping is exporting a product at a price that lowers its production costs in export markets through the loss compensated by selling at a higher price in the domestic market (Zhou & Percival, 2016). Dumping practices harm countries' economies as they represent unfair economic and trade competition which harms local makers in the importing country (Kostecki, 1991). Consequently, countries must address dumping to protect their domestic production (Davis, 2009).
Dumping is a harmful practice that can occur for two main reasons. First, it can occur when a producer wants to dispose of a large amount of product or crop as quickly as possible, selling it at the lowest possible price (Schmidt, 2023). Second, it may be driven by strategic objectives, such as market control or eliminating competition (Araujo et al., 2001). As explained in Figure 4. Therefore, it is essential for nations to monitor and act against dumping practices in order to safeguard their domestic industries.(Ding et al., 2023).

Competition	**Dumping**
Competition happens when producers compete with each other to enhance product quality and reduce costs using modern production methods.	When producers sell their products at prices less than their production costs, it is known as dumping.
The goal of competition is to dominate the market while achieving the efficiency of economics through lower production charges and improved the quality of the product.	The primary objective of dumping is to eliminate competition by forcing other local producers out of the market.
Prices are single-minded based on the laws of demand and supply, and fair competition is promoted.	This practice aims to dominate the market without achieving economic efficiency, often resulting in the dominance of the exporting product in the local market of the importing country.

Figure 4.
The distinction between competition and dumping is based on the methods utilized and the level of economic efficiency attained.
Source: Authors' own elaboration based on Araujo et al., (2001), Dadoosh & Alomary, (2022), Viner, (1923), Zhou & Qu, (2022).

In the case of market control, an exporter may aim to dominate a country's domestic market by selling products at low prices, which can lead to long-term economic gains (WTO, 2023). On the other hand, dumping can be used to eliminate competing producers, especially those in the importing country. Selling products at extremely low prices, competing producers are unable to sustain themselves in the local market (Smith, 2022). Once the exporter has established dominance in the local market importing country, they can increase prices and achieve substantial profits (Kostecki, 1991). Dumping practices can have serious negative consequences for the economies of importing countries, particularly for local producers.

The World Trade Organization (WTO), was established in 1995, plays a fundamental role in regulating international trade. Its primary mission is to simplify the smooth flow of international services and goods by reducing trade restrictions and discipline in international trade and establishing rules of conduct. The WTO aims to ensure fair competition and non-discrimination among its member

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countries, thereby granting equal entrance to each other's marketplaces. This objective is critical in promoting a balanced and equitable global trading system (B. M. Hoekman & Kostecki, 2009).

The WTO also emphasizes the temporary nature of anti-dumping measures, which are typically reviewed and can be suspended after five years unless further investigation justifies their continuation. This provision ensures that measures are not maintained longer than necessary and that they remain consistent with the principles of free and fair trade (WTO, 1995).

Moreover, studies have shown that the economic impact of antidumping measures can vary widely. Antidumping duties can lead to significant market distortions if not carefully managed. Therefore, ongoing monitoring and evaluation are essential to ensure that these measures achieve their intended protective effects without unduly hindering trade (Prusa, 2001). Figure 5 shows the effects of liberalization on trade on industrial productivity in Iraq.

The impact of trade policies on industrial productivity with and without protective measures, showing a significant enhancement in productivity with the implementation of protective measures.

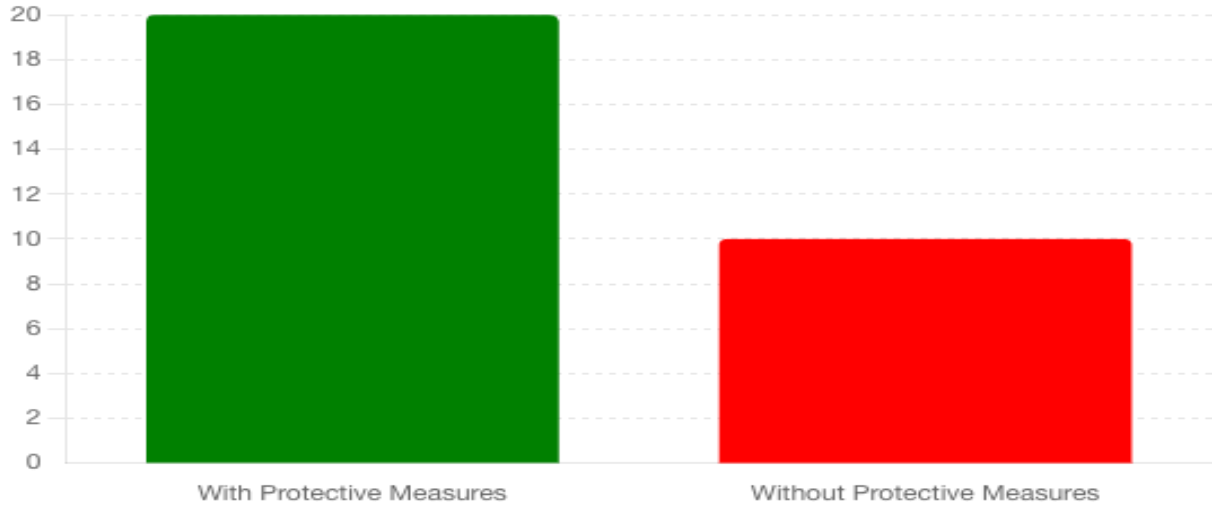

Figure 5.
Impact of trade policies on industrial productivity.
Source: Authors' own elaboration based on Deardorff & Sterm, (2005).

The WTO plays a vital role in international trade, regulating and protecting member countries from unfair competition practices like dumping. By providing a legal framework and guidelines for anti-dumping measures, the WTO helps ensure a fair-trading environment that supports the growth and development of domestic industries. However, the effectiveness of these measures varies among countries, highlighting the need for continuous capacity building and international cooperation to uphold the principles of fair trade (Viner, 1923).

Anti-dumping applications: International trade policies play a substantial role in economic policymaking, both at the countrywide and global levels. These policies impact the economic development programs of countries and determine their position in the global market and the international arena.

Expanding international trade is essential for enhancing specialization and the division of labor across the world. However, some countries limit the freedom of international trade and impose barriers to international exchange, especially concerning imports, even though free trade can benefit all parties involved. Trade policies differ based on the economic system, its level of development, the international political and economic context, and the nature of prevailing international economic relations (Anderson & Yao, 2003; Moore & Zanardi, 2017; Ossa, 2018). Economic impacts of agricultural protection

demonstrate significant differences between the United States and Japan, indicating how varied trade policies can affect economic outcomes.

The concept of international trade policy has numerous definitions, yet they converge on the same objective. Some define trade policy as "the set of means used by a state in its trade within its external relations, with the aim of achieving specific national goals" (Blonigen & Prusa, 2003). These goals depend very much on the level of development. In advanced countries, the purpose may be to achieve full employment as proposed by Keynesian analysis, while in developing countries, trade policy is often used to serve economic development (B. Hoekman & Kostecki, 2009).

After 2003, Iraq moved suddenly to a free trade system under law No. 54, which was issued by the civil governor, P. Bremer, in 2004. This law eliminated discrimination in foreign or imported goods and introduced immediate commercial freedom. Consequently, the market in was flooded with crops, as well as plants, various agricultural, and animal products.

However, at the same time, Iraq's domestic agricultural production suffered due to the lack of knowledge and resources additionally, agricultural lands and facilities were destroyed during military operations. This resulted in a significant decrease in agricultural output, both crops and livestock, in Iraq. As a result of the adoption of the commercial freedom policy and openness, the relative significance of domestic agricultural products in Iraq decreased, leading to a decline in its contribution to Iraq's GDP from 2003 to 2024. Figure 6 illustrates the contribution of agriculture to GDP in the last period.

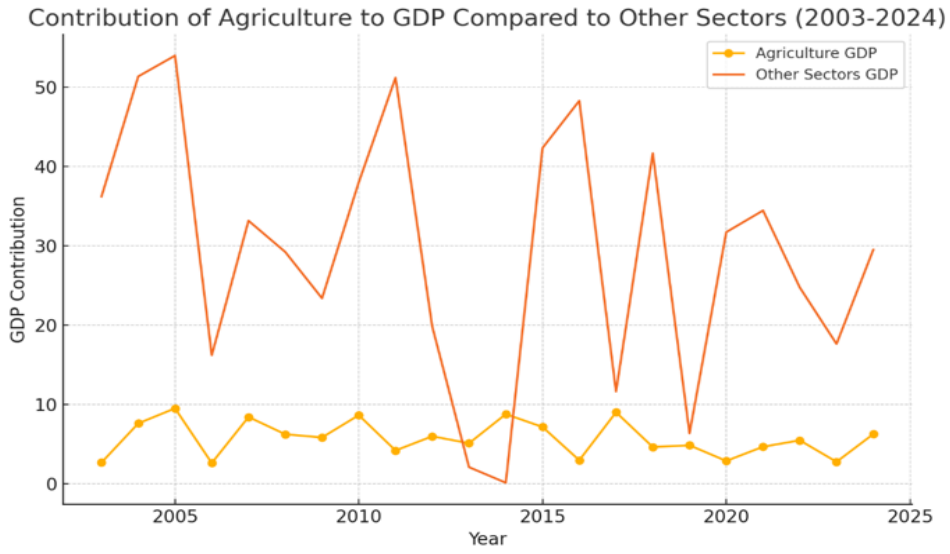

Figure 6.
Contribution of agriculture to GDP compared to other sectors (2003-2024).
Source: Authors' own elaboration based on FAO, (2020), Ministry of Agriculture (2024).

Anti-dumping measures are trade defense instruments that protect national industries from exporters' competition perceived as unfairly priced imports (Bown, 2009). The imposition of anti-dumping duties is justified when it can be proven that imports are being sold at less than their usual value, causing significant harm to domestic production (Prusa, 2001). The lack of anti-dumping policies in Iraq has led to a market inundated with cheaper foreign goods, making it difficult for local producers to compete (Evenett, 2019; Staiger & Sykes, 2017).

4. Results and Analysis

Analysis Using the Autoregressive Distributed Lagging (ARDL) Methodology In studying the relationship between agricultural output and both agricultural and food imports in Iraq

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4.1. Standard Study Methodology

Data source: Iraqi Ministry of Planning, Central Statistical Organization, Foreign Trade Statistical Bulletin, Arab Organization for Agricultural Development, Arab Agricultural Statistics Yearbook, National Accounts Directorate.

Statistical program used: EViwes 12

First - Building the model:

- Formulating the model (mathematical form of the model):
- Model tests:

a. Time series stability test:
b. Joint integration test:
c. Diagnostic tests for the (ARDL) model.
d. Structural stability test for the coefficients of the (ARDL) model.
e. Estimating the relationship in the short and long-term using the Error Correction Model (ECM).

First - Building the model: The Autoregressive Distributed Model Lag (ARDL) was estimated in the study of the relationship between agricultural output as a dependent variable and both agricultural imports and food imports as independent variables to show the effect of each on the dependent variable, as 21 annual observations of the variables were monitored from 2000 to 2020. This model is distinguished by testing the linear relationship between the studied variables, in addition to the fact that it does not allow the presence of second-degree integrated variables I (2) as it determines the joint integration relationship, i.e., the equilibrium relationship between the dependent and independent variables and determines the size of the effect of each independent variable on the dependent variable. It also determines the relationship in the short term by estimating the error correction model that contains the error correction limit and measures the model's ability to return to equilibrium after any shock occurs in the model. The ARDL model also eliminates the problem of autocorrelation in the residuals, and is used in the case of small-sized samples. The distributed lag autoregressive methodology was presented by (Pesaran; 2001) and (Shin; 1995) as a mixture of regression models with distributed lag models and is defined as a regression model that contains the lagged values of the dependent variable and the current and lagged values of the independent variables for one or more periods. If there is a dependent variable (Y) and more than one independent variable (Xi), the general mathematical formula for the (ARDL) model is as follows:

$$y_t = \alpha + \sum_{i=1}^{p} \lambda_i \, y_{t-i} + \sum_{j=1}^{k} \sum_{i=1}^{q} \beta_{ij} x_{j,t-i} + u_t$$

Where:

(P) Number of lag periods for the dependent variable.
(q) Number of lag periods for the independent variable.
(K) Number of independent variables.
(Ut) Random error vector.

4.2. Stages of Estimating the Required Model

4.2.1. Writing The General Formula of the Model

From the above, the model (mathematical form of the model) can be formulated according to the following formula:

AP = C (1) *AP (-1) + C (2) *AP (-2) + C (3) *IF + C (4) *IF (-1) + C (5) *IF (-2) + C (6) *IF (-3) + C (7) *IF (-4) + C (8) *IM + C (9) *IM (-1) + C (10) *IM (-2) + C (11) * IM (-3) + C (12) *IM (-4) + C (13).

Testing the stationarity of time series variables according to the (Phillips-Perron) test: Time series data are constantly changing as a result of developments and growth over time, and therefore they are characterized by instability of the mean and variance, and it is necessary to verify the extent of their

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stability by using the stationarity test (unit root test), and determining their degree of integration, before using them in standard analysis to avoid obtaining misleading or inaccurate results that may change the reading of the actual reality of the relationship studied between the variables. Despite the multiplicity of stationarity tests; The (PP) test is considered the best in knowing the state of stationarity of short time series used in the regression model with multiple gaps (ARDL).

Unit root test results table (PP)				
Null Hypothesis: The variable has a unit root				
	At level			
		AP	**IF**	**IM**
With constant	t-Statistic	-1.6620	-2.8129	-3.4656
	Prob.	*0.4342*	*0.0743*	*0.0205*
		n0	*	**
With constant & trend	t-Statistic	-1.5946	-2.5858	-3.2903
	Prob.	*0.7585*	*0.2892*	*0.0964*
		n0	n0	*
Without constant & trend	t-Statistic	-0.0155	-1.4179	-1.4100
	Prob.	*0.6656*	*0.1409*	*0.1429*
		n0	n0	n0
	At first difference			
		d(AP)	d(IF)	d(IM)
With constant	t-Statistic	-3.6448	-5.7183	-10.1860
	Prob.	*0.0147*	*0.0002*	*0.0000*
		**	***	***
With constant & trend	t-Statistic	-3.5357	-5.9085	-17.2068
	Prob.	*0.0640*	*0.0007*	*0.0001*
		*	***	***
Without constant & trend	t-Statistic	-3.6645	-5.8410	-10.3425
	Prob.	*0.0010*	*0.0000*	*0.0001*
		***	***	***

Figure 7.
Unit root test results.
Note: a: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1% and (no) Not Significant
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

The test results at a significance level of 5% show that all the studied variables are not stable at the level whether there is a constant or a vector or without them, while they are all stable at the first difference with the constant as well as with a vector without the constant, and while both the agricultural and food import series are stable at the first difference with the vector and the constant, the output series is not stable and therefore there are no integrated variables at the second degree I (2) and this is one of the most important conditions for using the (ARDL) model.

3. Testing the determination of the optimal lag periods for the model: The optimal lag periods for the model were determined according to the Akaiket criterion and using the maximum number of gaps (4) and the Schwarz information criterion (SIC). The best model was according to the lowest value shown by the test results as representing (2,4,4), i.e. among all the models that can be estimated according to multiple lag periods, this model is the best to represent the relationship studied, as the dependent variable (AP) is slowed by two periods, and each of the independent variables (IM) and (IF) is slowed by four periods.

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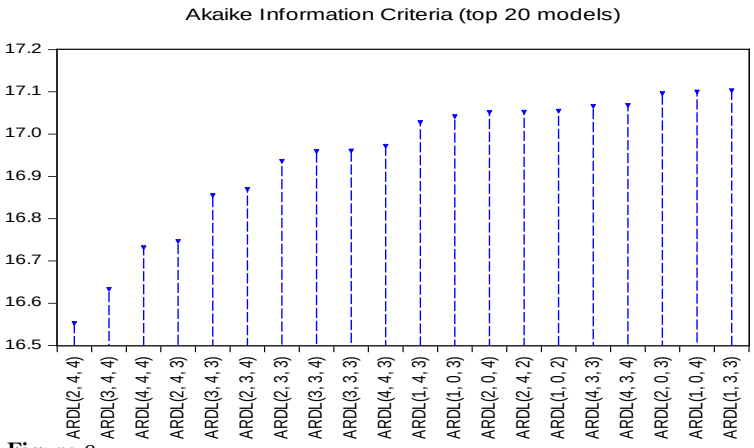

Figure 8.
Unit root test results: Akaike test results for determining lag periods.

4.2.2. Diagnostic Tests of the Model

Before adopting model (2,4,4) in estimating the short- and long-term relationship and its effects, the quality of this model's performance must be verified by conducting the following tests:

A. Test comparing the actual and estimated values: The results of this test, represented in the following figure, show that the estimated values are close to the actual values, which indicates the quality of the estimated model.

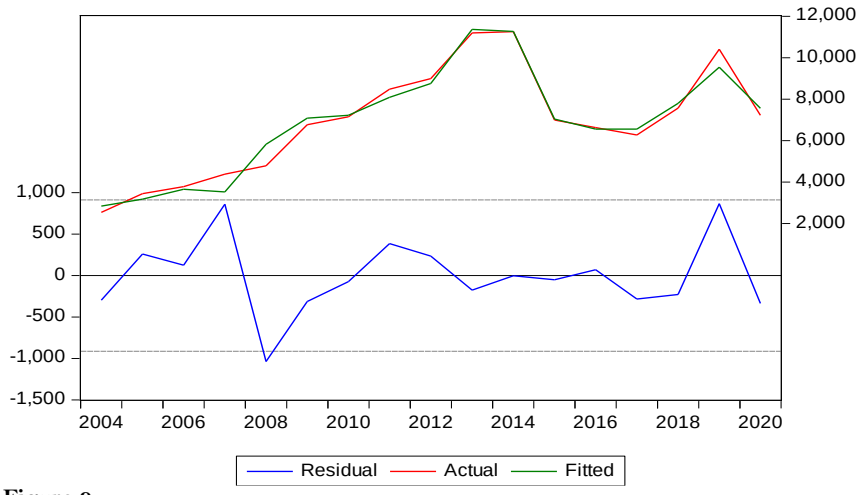

Figure 9.
Results of testing the estimated and actual values of the model.

B. Normal distribution of residuals: The nature of the distribution of residuals is verified by testing the hypothesis that "the residuals are normally distributed." This is done by extrapolating the statement that allows observing the accumulation of residuals around the center and decreasing as they move away from the center toward the outskirts, or not.

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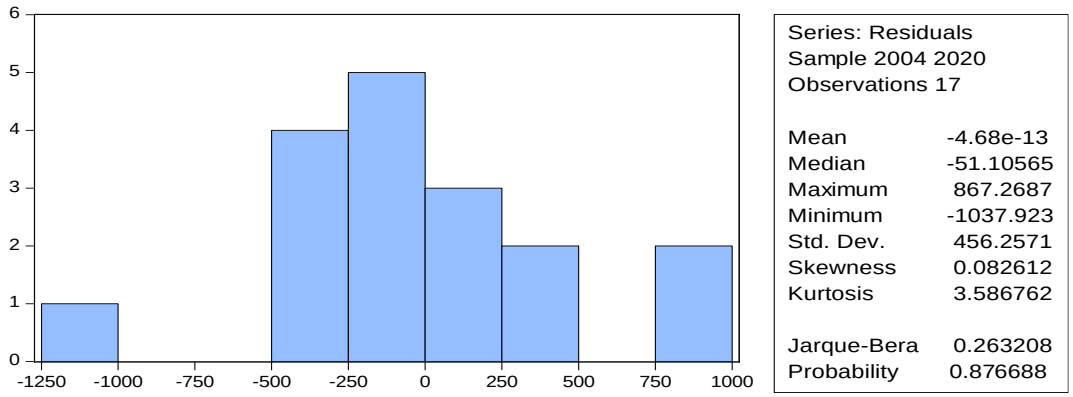

Figure 9.
Results of the Jarque-Bera test for normal distribution. Continue….

The results show by comparing the values of (Jarque-Bera) and as is clear from the previous figure that the residuals are subject to normal distribution.

C. Autocorrelation test for errors: The presence of autocorrelation of the residuals is verified through the Lagrange statistic calculated according to the (LM) test, and the results show that there is no autocorrelation between the values of the residuals of the model.

Breusch-Godfrey serial correlation LM test:			
F-statistic	0.32089	Prob. F (2,2)	0.7571
Obs*R-squared	4.12986	Prob. Chi-Square (2)	0.1268
Test Equation:			
Dependent Variable: RESID			
Method: ARDL			
Date: 09/26/24 Time: 11:17			
Sample: 2004 2020			
Included observations: 17			
Presample missing value lagged residuals set to zero.			

Figure 10.
Breusch-Godfrey test results.

D. Homogeneity of variance test: This test is conducted according to (Breusch-Pagan-Godfrey), and its results show that its probability value is greater than the significance level, and therefore the statement is homogeneous or constant.

Heteroskedasticity test: Breusch-Pagan-Godfrey			
F-statistic	0.836379	Prob. F (12,4)	0.6379
Obs.*R-squared	12.15551	Prob. Chi-square (12)	0.4333
Scaled explained SS	0.870405	Prob. Chi-square (12)	1.0000
Test equation:			
Dependent variable: RESID^2			
Method: Least squares			
Date: 09/26/24 Time: 12:00			
Sample: 2004 2020			
Included observations: 17			

Figure 10.
Homogeneity test results. Continue…

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E. Residuals stability test: This test is used to verify that the data is free of any structural changes and that the model is valid for prediction, by judging the stability of the model through the graphical form of the movement of the model residuals as well as the squares of the model residuals as shown in the following figure, which shows its graphical representation within the critical limits at the significance level, which means accepting the stability of the model:

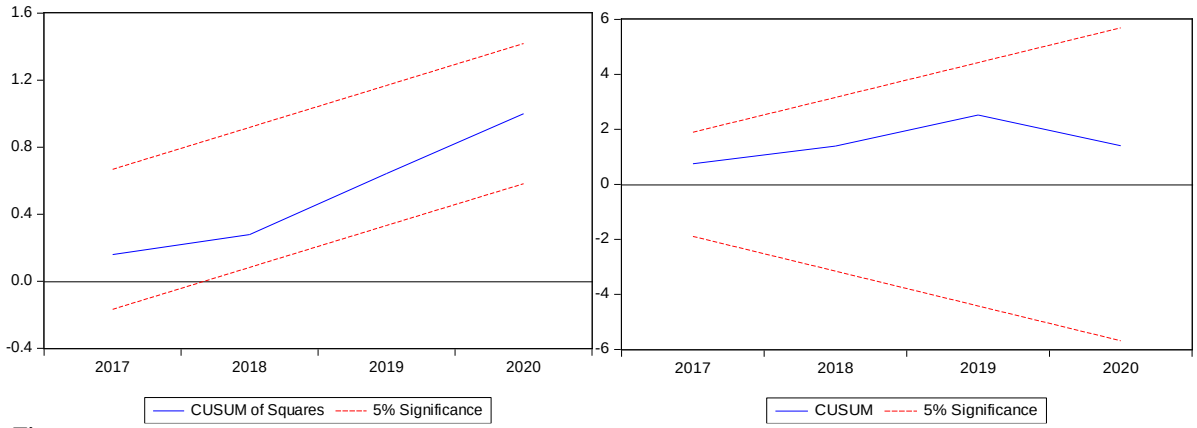

Figure 10.
Results of the residual stability test. Continue…

Testing the model parameters in the short and long term: Through this test, the possibility of joint integration between the model variables is studied, and the impact of the independent variables on the dependent variable is evaluated, in the long and short term.

4.2.3. A. Joint Integration According to the Bounds Approach

This test verifies the possibility of joint integration between the model variables using the bounds test methodology, the results of which indicate, given the probability values that are greater than the significance level, that there is no joint integration relationship between the studied variables. This means that there is a long-term equilibrium relationship between agricultural output and both agricultural imports and food imports.

F-bounds test		**Null hypothesis: No levels relationship**		
Test statistic	**Value**	**Signif.**	**I (0)**	**I (1)**
			Asym: n=1000	
F-statistic	1.670459	10 percent	2.63.	3.35.
k	2	5 percent	3.1.	3.87.
		2.5 percent	3.55.	4.38.
		1 percent	4.13.	5.
Actual sample size	17		Finite sample: n=35	
		10 percent	2.845.	3.623.
		5 percent	3.478.	4.335.
		1 percent	4.948.	6.028
			Finite sample: n=30	
		10 Percent	2.915	3.695
		5 Percent	3.538	4.428
		1 Percent	5.155	6.265

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Figure 11.
Results of the Bound test for joint integration.

Long-term relationship: The results of the long-term relationship test between the dependent variable and the independent variables show that there is a statistically significant long-term effect of the food imports variable on agricultural output, while there is no statistically significant effect of the agricultural imports variable on agricultural output.

ARDL Long run form and bounds test
Dependent Variable: D(AP)
Selected Model: ARDL (2, 4, 4)
Case 2: Restricted constant and no trend
Date: 09/26/24 Time: 14:09
Sample: 2000 2020
Included observations: 17
Levels Equation
Case 2: Restricted constant and no trend

Variable	Coefficient	Std. error	t-statistic	Prob.
IF	3.104429	1.100514	2.820889	0.0478
IM	0.323882	0.439902	0.736259	0.5024
C	-879.2130	2661.215	-0.330380	0.7577

EC = AP - (3.1044*IF + 0.3239*IM -879.2130)

Figure 12.
Results of testing the long-term relationship between variables.

Short-run relationship analysis: The error correction model (ECM) is used in the short-run relationship analysis in the ARDL model, where the error correction term is added as an explanatory variable, as it measures the amount of short-run imbalance that is corrected to return to the long-run equilibrium state as follows:

ARDL error correction regression
Dependent variable: D(AP)
Selected model: ARDL(2, 4, 4)
Case 2: Restricted constant and no trend
Date: 09/26/24 Time: 14:03
Sample: 2000 2020
Included observations: 17
ECM regression
Case 2: Restricted constant and no trend

Variable	Coefficient	Std. error	t-statistic	Prob.
D(AP(-1))	-0.372337	0.127906	-2.911022	0.0436
D(IF)	2.696513	0.489585	5.507755	0.0053
D(IF(-1))	0.300805	0.176370	1.705528	0.1633
D(IF(-2))	0.087946	0.173771	0.506103	0.6394
D(IF(-3))	-0.478397	0.180146	-2.655603	0.0566
D(IM)	-0.012243	0.080722	-0.151664	0.8868
D(IM(-1))	-0.215171	0.143720	-1.497152	0.2087
D(IM(-2))	0.058567	0.152478	0.384099	0.7205
D(IM(-3))	0.213980	0.102312	2.091442	0.1047

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CointEq(-1)*	-0.652711	0.190877	-3.419534	0.0268
R-squared	0.932715	Mean dependent var		307.0618
Adjusted R-squared	0.846207	S.D. dependent var		1758.943
S.E. of regression	689.7959	Akaike info criterion		16.19984
Sum squared resid	3330728.	Schwarz criterion		16.68996
Log likelihood	-127.6986	Hannan-Quinn criter.		16.24856
Durbin-Watson stat	2.483789			

Figure 13.
Results of the short-term relationship test between variables.
Note: * p-value incompatible with t-Bounds distribution.

The results of the error correction model in studying the relationship between agricultural output and agricultural and food imports, shown in the following table, show that:

- There is a positive and statistically significant effect of the food imports variable and the one-period lagging on agricultural output, where whenever agricultural imports increase by 1%, agricultural output increases by 2.697%.
- There is no statistically significant effect of the agricultural imports variable on agricultural output.
- There is a short-term dynamic relationship between agricultural output and food and agricultural imports, due to the negative and statistically significant estimated error (-0.652711), which measures the percentage of imbalance in the dependent variable that can be corrected from one time period to another, in other words, 62% of the changes in agricultural output are attributed to structural changes in the independent variables.

5. Discussion

International trade policies play a significant role in economic policymaking, both at the national and global levels (Zanardi, 2004). These policies impact the economic development programs of countries and determine their position in the global market and the international arena (Krugman et al., 2018).

Expanding international trade is essential for enhancing specialization and the division of labor across the world. However, some countries limit the freedom of international trade and impose barriers to international exchange, especially concerning imports, even though free trade can benefit all parties involved (Bhagwati, 2004). Trade policies differ based on the economic system, its level of development, the international political and economic context, and the nature of prevailing international economic relations. There are two main approaches in economic thought and practice:

Impact	Details	Recommendations
Impact on local production	Significant decline in local production due to inability to compete with cheaper foreign imports, leading to lower quality of local products.	Implement protective tariffs on dumped products and provide financial and technical support to local producers.
Impact on employment	Increased unemployment rates as many local factories and farms shut down, particularly affecting the youth.	Create job opportunities by supporting local industries and investing in skill development programs for the youth.
Impact on inflation	Initial decrease in prices followed by long-term	Stabilize prices by reducing dependence on imports and

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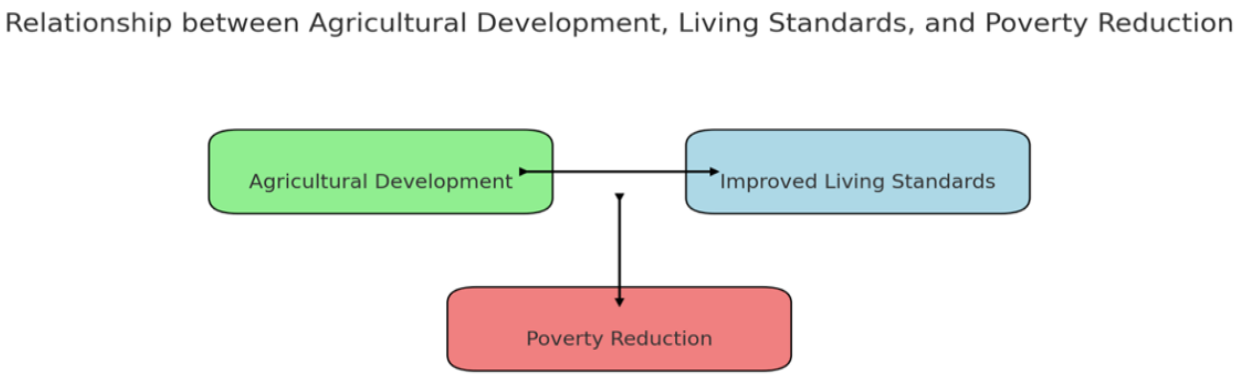
	inflation due to reliance on imported goods, leading to higher living costs.	investing in local production capabilities.
Impact on economic growth	Slowdown in economic growth due to reduced investments in local industries and weakened infrastructure.	Boost economic growth by diversifying the economy, improving infrastructure, and attracting both local and foreign investments.

Figure 14.
Analysis of the impact of trade dumping on the Iraqi economy.
Sourec: Mahdi & Davood, (2023), Mustafa, (2020), J. Prusa, (2001).

The first, approach advocates for freedom and the removal of all restrictions on international trade, as it leads to greater economic welfare (Rodrik, 2011).

The second, approach calls for protectionism and sees the necessity for state intervention and the use of its authority to influence international trade and its volume, or to settle trade disputes. It is recognized that there is no absolute form of freedom or protectionism in trade policy, as they are often blended to varying degrees (Stiglitz, 2002).

To begin with, the concept of international trade policy: there are numerous definitions of international trade policy, all leading to the same objective. Some define trade policy as "the set of means used by a state in its trade within its external relations, with the aim of achieving specific national goals" (Gandolfo, 2014). These goals vary depending on the level of economic development. In advanced countries, the purpose may be to achieve full employment as proposed by Keynesian analysis, while in developing countries, trade policy is often used to serve economic development (Suranovic, 2017). The agricultural trade policy is the most important because of its importance in revitalizing the countryside, improving income, attracting investment, fighting poverty, and improving food security. As evidenced in Figure 15 the relationship between agricultural development, living standards, and poverty reduction



Ffigure 15.
Relationship between agricultural development, living standards, and poverty reduction.
Source: Boyden & Dercon, (2012).

Foreign economic policy refers to the activity undertaken by a state in the field of international trade with foreign entities. This concept has been present since the early stages of capitalist development. Initially, international economic relations primarily revolved around commodity trade. However, as time progressed, other elements emerged as subjects of international exchange (Mikić, 2019). These elements include the exchange of services, international capital flows, and their associated transformations. The traditional concept of trade policy alone is no longer sufficient to encompass these new developments. A new concept emerged: the concept of foreign economic policy, reflecting the new landscape with its new components (Feenstra & Taylor, 2017). There are two meanings in this field:

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The traditional concept refers to a state's policy of exchanging goods only with foreign entities (Gandolfo, 2014). The broader concept denotes foreign economic policy, which encompasses a system of economic relations with foreign entities (Feenstra & Taylor, 2017). Foreign economic policy can be defined as measures or laws enacted by the government as a political entity to directly or indirectly influence the volume of trade between it and other countries or affect the quality and direction of trade (Mikić, 2019).

Trade policy is known as the economic policy applied in the field of foreign trade. It encompasses the sum of actions taken by sovereign authorities in the economic realm to achieve specific goals (Suranovic, 2017). Trade policy comprises a set of measures implemented by sovereign authorities in the field of foreign trade to accomplish specific objectives. Measures related to import and export, such as quotas, tariffs, and subsidies, are part of trade policy. A specific definition of trade policy can be formulated as "a set of tools and measures adopted by a state to achieve gains and benefits for its national economy"(Feenstra & Taylor, 2017). Thus, its tools and measures vary from one country to another, with each country seeking to maximize its trade benefits (Gandolfo, 2014).

A country's macroeconomic policy is heavily influenced by its trade policies. The policy impacts the growth of the economy's productive sectors and the creation of job possibilities (R. Rahim & Ali, 2021). Furthermore, trade policy has the potential to create markets for local products, both domestically and internationally, increasing demand for local products and resulting in increased production and employment, which impacts a country's economic growth and GDP. Trade policy is a crucial component of a country's international economic strategy, using specific tools and methods to achieve specific objectives in foreign trade. Through trade policy, a country establishes a commercial policy that governs its commercial relations with other countries. This trade policy is implemented through laws, decision-making processes, procedures, and tools to achieve economic goals (Abd alkader, 2011).

Governments take various measures to protect their industries and increase production, including supporting inputs, outputs, marketing, imposing restrictions on international transactions, and imposing import quotas (WTO, 2012). The rade protection policy aims to restrict a country's foreign trade to safeguard local products and markets from foreign competition (Ali, 2020; S. Khaled, 2014).

However, in Iraq, trade policies after the political and economic change in 2003 did not meet the level needed for the national development of productive sectors. This shortfall resulted from disruption and instability caused by various reasons, including financial corruption and security, administrative challenges, and political challenges. Agricultural price policy is an important policy tool that assists in reducing the price fluctuations and agricultural incomes the agricultural sector suffers from (Ibrahim & Abdullah, 2022). The price policy represents the direct and indirect ways to influence the various components of price, such as indirect taxes, subsidies, fees, margins, and costs. For instance, price stability, one of the main pillars of price policy, reflects an aspect of a stable economy, which is an important tool in raising the standard of living. Additionally, price policy is one of the significant measures in an economy that direct agricultural production to the optimum level (Ibrahim & Abdullah, 2022).

In Iraq, the agricultural price policy aims to incentivize farmers to produce sufficient quantities of main crops to supply food, thus reducing the food gap between locally produced amounts and consumption (Noori & Hiyali, 2019). While the policy has succeeded in achieving some of its goals, it has also failed in others due to weaknesses in the procedures accompanying their implementation, alongside social and political conditions. In instances where the implementation of the policies has succeeded, it has had a range of effects on Iraq's national economy. For instance, the agricultural subsidies policy has generated both direct and indirect effects on the economy. The subsidy policy has indirect impacts on upward and downward trends within the industrial sector. It supports production inputs like fertilizers and pesticides, as well as agricultural and food industries (Noori & Hiyali, 2019). Janabi et al. (2023) go on to say that corn is one of the most significant crops in Iraq in terms of livelihood. As a result, the government focused on its production by supplying some fundamental production requirements at subsidized and reduced costs. Furthermore, the Iraqi government has

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encouraged crop marketing to ensure increased demand, availability, and purchase at higher subsidized costs than international prices. This has resulted in increased public expenditure while slowing the expansion of public resources, as well as pricing distortions (A. Janabi et al., 2023).

The Iraqi government's agricultural support product price policy directly supports agricultural commodities and food production. "This policy is designed to boost production in order to meet the food demands of the population" (Norsida, Hassan, et al., 2017). Due to low production in the country, the state meets the demands of its consumers through imports. The government intervenes by paying a premium to boost production and decrease dependence on imported agricultural products. This support enables consumers to purchase items from local producers at attractive prices, ultimately promoting sustained production. The state subsidizes the selling price of agricultural products to match the support cost per unit (Bayati, 2007).

Furthermore, the policy of supporting input and output prices is another notable agricultural trade policy. The goal of this policy is to encourage producers to increase local production by reducing production costs. Notable production inputs considered by the policy include veterinary medicine, sterilizers, and concentrated feed, which are important in meat production. The government imports these inputs and provides them at a subsidized price, covering the price difference between the sale price and the actual cost of the inputs (Norsida, Radam, et al., 2017).

Agricultural marketing policy is an integral part of agricultural trade policy, as it plays a crucial role in providing marketing services, including transportation, storage, sorting, packaging, and financing of commercial transactions. These services have a substantial impact on the development of agricultural goods and products, benefiting both consumers and producers economically. Furthermore, the policy aims to achieve market efficiency of agricultural goods through price stability, waste reduction, and providing goods to consumers or inputs at the lowest price attainable. However, many farmers in Iraq do not realize the importance of adding value to their products, resulting in low profit margins and product damage before reaching the market. Therefore, the state has established numerous marketing institutions and channels to facilitate marketing (Norsida, Radam, et al., 2017).

6. Conclusions and Recommendations

The results of the current study have a number of implications for agricultural policymakers, practitioners, and stakeholders in Iraq. Firstly, as the findings reveal, allowing import dumping can have negative implications for Iraqi agricultural output at a national level. Therefore, government authorities within the Ministry of Agriculture must do all they can to stop such activities (Hanoush, 2013). Subsequently, heavy and strict tariffs and protective policies need to be imposed on every foreign commodity, especially those that are being imported in large quantities, as well as the need to implement and strengthen technical barriers and sanitary and phytosanitary policies (Shaban et al., 2015).

The effect of these policies should be monitored by transferring the competences of these two sectors especially the Iraqi State Responsible for Industrial Research and Government Institutions, as well as Iraqi Agricultural Associationsby enabling them to assess the effects of these policies fully (Norsida, Radam, et al., 2017). Finally, within 10 years at most, a periodic assessment of the review of the effects of these policies will be conducted (Attabi et al., 2020). The main objective is to establish a mechanism or authority responsible for following up and interacting with the global economic structures and partners while taking into account the priorities and interests of Iraqi society (Babili, 2012). However, if the government is unable to take stringent measures to protect local industries, it has a number of other measures it can take to protect the local farmer. (Musawi & Musawy, 2020). (Ghadhban & Jbara, 2019).

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