The Consumer Price Index and its Role in Influencing Exports, Food Imports, and the Local Output of the Jordanian Agricultural Sector

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Abstract: - Jordan is in the east of Asia, with 91971 km2 of land and water of 329 km2. The study examined the consumer price index as an independent factor and its impact on exports, food imports, and the agricultural sector's local output as dependent factors in the Jordanian economy. The study took the period from 2006 to 2016 as a sufficient period for measurement, as the agricultural sector is important in the process of economic development, so it was necessary to study the factors affected by the process of changing the price structure represented in the index of the consumer price, as this factor is important in decision-making by businessmen and government alike.

To express these variables, statistical measures had to be taken in the analysis, based on finding the simple linear regression of the dependent and independent factor by least squares and testing the estimated equation to avoid measurement errors. The relationship between the different variables influenced by the consumer price index, which the study was taken into, represents the column of this sector of production, export, and import. Under globalization, a country cannot be satisfied with its production and self-sufficiency. Still, there is an external world that carries out open international trade according to each country's comparative advantage, and we believe that Jordan possesses this comparative advantage in the agricultural sector due to its land and work resources. Still, the circumstances surrounding the rise in prices affect this sector. As for the trade balance and Jordan's entry into the International Trade Organization, the door has been opened for external work in intra-trade with external knowledge until the price increase affects the exported products' prices. Imported goods can enter at lower prices, which affects the sector. The study found a strong direct relationship between the consumer price index and the agricultural sector's domestic product, with the addition of economic justifications for these results and the study reached the results and recommendations, the most important of which was finding direct support for citizens in light of the conditions of rising prices and increasing immigrants.

Key-Words: - Consumer Price Index, Exports, Imports, GDP, Agricultural Sector, Jordanian economy.

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1 Introduction

The change in prices, inflation, and its relationship with the consumer price index greatly impact economic activity in general. The study deals with the effect of the consumer price index on the agricultural sector, which is represented by its domestic product, exports, and imports of agricultural products. The importance of this lies in the importance of food at the global level, especially in bad economic conditions. Note that foodstuffs' prices increased globally during the period 2007-2008 and 2010-2011, [1].

The noticeable rise in global prices impacted Jordan, as it is part of the Third World, which is

quickly affected by the surrounding conditions. A study is needed to find solutions for the awakening in this vital sector, especially what this sector possesses of unique features in the ability to produce, with a decline in some sectors during the same duration of the study and a marked increase in productivity.

1.1 Study Problem

International exchange is one of the principles of the scarcity of materials because no country has all the necessary resources, [2].

The study problem can be put in the form of questions:
1. Is there a relationship between changing prices for food products and the number of exports from them?
2. Is there a relationship between changing prices for food products and the number of imports from them?
3. Is there a relationship between changing prices for food products and food production?
4. Is there a relationship between the price index and the increase in demand for food commodities?
5. Do high prices have positive effects on the economy?

1.2 Study Objectives

The purpose of this topic is about trying to achieve the following goals:
1. Clarify the consumer price index and methods of its measurement.
2. Clarify the materials that the agricultural sector exports and imports.
3. Clarify the concept of the trade balance and the role of the agricultural sector in supporting it.
4. Clarifying the extent of the agricultural sector's participation in local production.

1.3 The Importance of the Study

The study's importance lies in knowing how to advance in the agricultural sector and provide the national economy with production while researching the causes of decline or progress in this sector. And work to enhance the positive factors and get rid of obstacles to progress.

1.4 Study Variables

The first equation
Independent variable: The consumer price index for food commodities
Dependent variable: Food exports
The second equation
Independent variable: The consumer price index for food commodities
Dependent variable: Food imports
The third equation
Independent variable: The consumer price index for food commodities
Dependent variable: The GDP of the agricultural sector.

1.5 The Hypothesis of the Study

They are all testable parameters of society, [3].
The study is based on three hypotheses:
First: Null hypothesis H0: There is a positive relationship between the consumer price index for food commodities and food exports.
Alternative hypothesis H1: There is a negative relationship between the consumer price index for food commodities and food exports.
Second: Null hypothesis H0: There is a positive direct relationship between the consumer price index for food commodities and food imports.
Alternative hypothesis H1: There is a negative relationship between the consumer price index for food commodities and food imports.
Third: Null hypothesis H0: There is a positive direct relationship between the consumer price index for food commodities and the agricultural sector's GDP.
Alternative hypothesis H1: There is a negative relationship between the consumer price index for food commodities and the agricultural sector's GDP.

1.6 Tools and Scales of the Study

To establish or deny the validity of the research hypotheses, a descriptive statistical analysis method will be used to display the statistical tables for all variables during the study period from 2006 to 2016; then, we will use the standard census method to estimate simple linear regression and perform the necessary tests to prove the estimated equation and determine the nature of the relationship between the variables and its strength using the EViews 10 program until we reach the aim of the study.

1.7 Data Collection Method

The researchers relied on the general statistics reports of the Ministry of Industry and Trade and the Ministry of Agricultural Statistics (2006-2016).

2 Previous Studies

The study examined Nigeria's inflation rate of 10% and how it was affected by interest rates that contributed to the increase in inflation. The study found that the work of the Central Bank of Nigeria must change its approach because its monetary policy hurts Nigeria's inflation and must control the supply of cash, knowing that monetary policy alone is unable to combat inflation, [4].

The study is based on an analysis of food price fluctuations in Indonesia's inflation and a correlation between staple prices and inflation, especially during the coronavirus period, while monetary policy indirectly affected prices of agricultural products and inflation and low-income earners in developing countries, [5].

The Study's overarching objective is to assess the influence of Saudi Arabia's and Jordan's respective monetary and fiscal policies on agricultural output and GDP expansion in several Arab countries, with a focus on Iraq. The study adopted a descriptive method mixed with quantitative analysis performed in a statistical package (Eviews10). Thirty-one years (1990-2020) were analyzed in the study's time series. The autoregressive vector model was selected to estimate the correlation between the long- and short-term variables. This study employed a model to examine the correlation between macro policies (financial and monetary) in the agricultural sector and the economic growth rates of various countries in the sample. The findings revealed that the policies implemented by these countries were ineffective, leading to a decline in the agricultural sector's contribution to economic growth. Notably, Iraq and Saudi Arabia, being oil-dependent nations, experienced particularly low added value in the agricultural sector, resulting in reduced economic growth. Conversely, Jordan witnessed an increase in added value, which positively impacted its economic growth. It was suggested that the sample countries' economic growth rates might be increased if fiscal and monetary policy relied more heavily on mechanisms that increased agricultural added value, [6].

The study is based on the function of Cobb-Douglas in blending the element of work and capital in the production of the Jordanian agricultural sector, which contributes to domestic production and achieves food security, especially in developing countries, including Jordan. The study found that Jordan's agricultural sector is on a decline. The intensity of the capital used in the Jordanian agricultural sector is below the required level. One of the most important recommendations was to bring investments to the agricultural sector and focus on scientific research in the development of production., [7].

While agroecology has been criticized for its wasteful use of land, it has also been proposed as a means of extending the life of the food chain. Five exploratory stories were compared to stakeholder-developed scenarios for the food system in the EU in 2050. We projected a range of biophysical (such as food production and land usage), environmental (such as glasshouse gas emissions), and social indicators by 2050, including the possibility of local food self-sufficiency. There were two opposing stories about how to expand agroecological practices. One nation has used agroecology to produce high-value goods for high-income consumers through trade, while only meeting two of the eight environmental policy criteria of the EU and 40 percent of its agricultural land being under, [8].

The study used standard analysis of the existence of causal relationships in the long run. The study concluded that exports had the highest impact on inflation in the Pakistani economy. The study recommended encouraging local investment, especially in the textile, fish, and agricultural products sectors, [9].

The study examined the price that is one of the most important factors influencing the purchase decision. Producers and retailers developed pricing methods, and there were more appropriate ways to deal with consumers, From the study's questions is whether these methods influence consumer purchasing decisions and the perception of the quality of the product and build a clear perception of the consumer in comparing prices and selecting the product that makes the highest gain under the other variables as the price directly affects the intention to buy, [10].

The study aims to clarify inflation and the consumer price index, the reasons for the rise, and the proposed solutions. The study found that reducing consumption and pushing towards saving and developing exports are proposed solutions to Egypt's inflationary situation. It also aimed to restrict external imports of goods and services and overcome the deficit in the balance of payments, [11].

The study aims to show the importance of exports in agricultural output growth and the

importance of economic blocs in foreign trade; the study mentioned the obstacles that affect exports. Egyptian agricultural exports, export decisions, foreign trade relations, and the deficit in the trade balance. The study also determined the importance of prices and their determination, economic blocs and trade relations, and the opening of new markets, [12]. The study aims to show inflation and the rise in the consumer price index for Yemeni economic activity from 1990 to 2000 where. Yemen was suffering from inflation, which reached 482.6% at the end of 2000, and the study found that the effect of this was different from one city to another in Yemen. The study also found that the increase in consumer demand and lower production were the main factors for inflation, which led to a decrease in per capita income and the currency's purchasing value, [13].

The study stated that considering globalization, the sectors had become highly influenced by the factors affecting them in light of globalization; the third chapter in the study indicated an analysis of the role of foreign trade in the Jordanian economy, exports and imports, and the researcher used the data in the study from 1969 to 1996.

One of the most important results was the apparent effect of foreign trade, exports, and imports on the gross domestic product and its components and the interdependence between countries in trade relations, [14].

3 Descriptive Framework

The price index's primary use is to convert the face value into a real value, [15].

The consumer price index is known as a statistical measure of changes in the prices of a basket of goods and services and the comparison of prices with prices for the base year.

Goods differ in their response to change and size according to the weights for the relative importance of each commodity and the relative importance of goods and services: The percentage of the share of expenditures on a good or service from the total expenditures for all goods and services.

"The Relative Importance of the Consumer Price Index, Basis 2010 (2006-2019)" according to Table 1 in the Appendix section.

Shows the relative importance of goods in Jordan from 2006 to 2016 divided into 12 groups where the largest share was for food and non-alcoholic beverages, with a percentage of 30.51 for food and 2.86 for non-alcoholic beverages and they combined in one group and took 33.36 of relative importance, followed directly by the house with a percentage of 21.92 and it was the least relative importance of the share of restaurants and hotels, reaching 1.83, and the index measures public consumer prices by the following formula, [16].

First, we calculate the high or low prices of materials according to the groups by the following equation, [17].

PN\PO*100=PI

Where:
PI: Price Index
PN: Price New
PO: Purchase Order
Then, we calculate the general index according to the relative importance of each group.
CPI=PIn*Wn +Pin+1+Wn+1……..Σ
Where
CPI: Consumer Price Index
PI: Group Standard Price
W: Relative importance of the set
N: Group

Thus, the general consumer price index is measured.

Due to the great importance of food commodities, we reduced the study to the index's effect as an independent factor for the rest of the dependent variables.

"Consumer price index for food and non-alcoholic beverages from 2006-2016 for the base year 2010 for each month"

From Table 2 (Appendix), which includes the price index of food and non-alcoholic beverages from 2006 to 2016 and from every month in the year, from 1 to 12, then the full year is averaged, we note that the price index was less than 100, before 2010 and this is normal because 2010 is a base year and it became 100 in the base year 2010 and then rose to 115.2 in 2015 at its highest level and returned to 111.2 in 2016.

We also note that the monthly index fluctuated in one year and reached 117.43 in the month of 10, 2015, [16].

"Quantities of food commodities exported according to food groups 2006-2016 in tons. "

As for the value of food exports, they were shown in Table 3 (Appendix) and divided into 19

food groups from 2006 to 2016. The table shows the quantities exported per ton of different materials. The largest export number of vegetables was 812,897 tons in 2013, and the least was fresh milk, which was 0 tons from 2006 to 2016. They always came in first place in export quantities, followed by fruits. As for the total and total exports in tons of all food commodities, the largest amount was in 2013, amounting to 1,105,191 tons, and the lowest exported quantity was in 2006, at 798,611 tons, [16].

"Quantities of imported food commodities according to food groups 2006-2016 in tons as for the value of imports of food", were also shown in Table 4 (Appendix) and they were divided into 19 food groups from 2006 to 2016. The table shows the quantities imported per ton of different materials. The largest amount of imported cereals and their products was 3,349,609 tons in 2014, and the least was fresh milk, which was 0 tons from 2006 to 2016. The grains and their products were always ranked first in the quantities imported, followed by sugar and sweeteners. As for the total and total imports per ton for all food commodities, the largest amount was in 2016 and reached 4,717,830 tons, and the lowest imported amount was in 2010 at 2,602,362 tons, [16].

"GDP at current prices from 2006-2016 Production of the agricultural sector" in developing countries in the third world is a way of earning a living and constitutes 25% of the value-added of the GDP, [18].

In Jordan, the GDP is at the current prices of the agricultural sector, and from Table 5 (Appendix), we notice that the GDP started to increase from 2006 to 2016. Likewise, the agricultural sector's GDP increased from the lowest value in 2006, amounting to 3719 million dollars in 2016, and reached 14127 million dollars, [16].

4 Results of the Study

And to measure the study hypotheses.
We take the first hypothesis and convert it to the next linear equation.

First Equation
EX= C * PI
Where
EX: Food exports
C: The constant factor
PI: Food Price Index

We take the second hypothesis and convert it to the next linear equation.

Second Equation
IM= C *PI
Where
IM: food imports
C: The constant factor
PI: Food Price Index
We take the third hypothesis and convert it to the next linear equation.

Third Equation
Q= C * PI
Where
Q: The GDP of the agricultural sector
C: The constant factor
PI: Food Price Index

We will enter and analyze the data in EVIEWS 10 first equation, second equation, and third equation.

4.1 The First Equation

EX= C * PI

Table 6. "Dependent Variable: EX"

Dependent Variable: EX
Method: Least Squares
Date: 11/30/23 Time: 22:46
Sample: 2006 2016
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	527828.7	169854.7	3.107531	0.0126
PI	4219.743	1671.472	2.524568	0.0325

R-squared	0.414575	Mean dependent var	952565.1
Adjusted R-squared	0.349528	S.D. dependent var	96046.64
S.E. of regression	77463.41	Akaike info criterion	25.51596
Sum squared resid	5.40E+10	Schwarz criterion	25.58831
Log-likelihood	-138.3378	Hannan-Quinn criteria.	25.47036
F-statistic	6.373442	Durbin-Watson stat	2.308367
Prob (F-statistic)	0.032524		

**Program eviews10*
Notes from the Table 6
H0: The model is inappropriate.
H1: the model is appropriate.

From the Table 6 Prob (F-statistic) (0.032524) is below the significant level (0.05). This means that the F-statistic has significant significance, and we take it in the alternative hypothesis. Thus, we say that

41% of the change in exports is due to the independent factor Pl.

The Prob for the independent variable (0.0325) (PI) is less than the significance level (0.05); that is (PI) has a significant significance, and the alternative hypothesis was taken.

The fixed Prob (0.0126) (c) is less than the significant level (0.05); that is, (c) has a significant significance, and the alternative hypothesis was taken.

In conclusion, the model is appropriate in estimating the relationship between the consumer price index for foodstuffs and food exports according to the following formula:

EX = 527828.749581 + 4219.74305871*PI

We test the Breusch-Godfrey Serial Correlation LM Test.

Table 7. "Breusch-Godfrey Serial Correlation LM Test"

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	**0.942313**	**Prob. F(2,7)**	**0.4341**
Obs*R-squared	**2.333343**	**Prob. Chi-Square (2)**	**0.3114**

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/30/23 Time: 22:49
Sample: 2006 2016
Included observations: 11
Pre-sample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**-38719.52**	**174532.2**	**-0.221847**	**0.8308**
PI	**469.6127**	**1737.184**	**0.270330**	**0.7947**
RESID (-1)	**-0.628641**	**0.483412**	**-1.300423**	**0.2346**
RESID (-2)	**-0.061871**	**0.492554**	**-0.125612**	**0.9036**

R-squared	**0.212122**	**Mean dependent var**	**-4.23E-11**
Adjusted R-squared	**-0.125540**	**S.D. dependent var**	**73488.25**
S.E. of regression	**77964.76**	**Akaike info criterion**	**25.64119**
Sum squared resid	**4.25E+10**	**Schwarz criterion**	**25.78588**
Log-likelihood	**-137.0265**	**Hannan-Quinn criteria.**	**25.54998**
F-statistic	**0.628208**	**Durbin-Watson stat**	**1.721226**
Prob(F-statistic)	**0.619486**		

**Program eviews10*
Notes from the Table 7
H0: If Prob> (0.05), there is no self-correlation.
H1: If Prob <(0.05), there is a self-correlation.

From the Table 7 F-statistic Prob (0.4341)> (0.05) we take the null hypothesis. There is no self-link.

Obs * R-squared Prob (0.3114)> (0.05) We take the null hypothesis, no self-correlation Heteroskedasticity Test: ARCH

Table 8. "Heteroskedasticity Test: ARCH"

Heteroskedasticity Test: ARCH

F-statistic	**1.523809**	**Prob. F (2,6)**	**0.2916**
Obs*R-squared	**3.031578**	**Prob. Chi-Square (2)**	**0.2196**

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/30/23 Time: 23:04
Sample (adjusted): 2008 2016
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	**1.08E+10**	**3.66E+09**	**2.937161**	**0.0260**
RESID^2(-1)	**-0.610042**	**0.516267**	**-1.181641**	**0.2821**
RESID^2(-2)	**-0.797143**	**0.507416**	**-1.570984**	**0.1672**

R-squared	**0.336842**	**Mean dependent var**	**5.78E+09**
Adjusted R-squared	**0.115789**	**S.D. dependent var**	**7.05E+09**
S.E. of regression	**6.63E+09**	**Akaike info criterion**	**48.32853**
Sum squared resid	**2.64E+20**	**Schwarz criterion**	**48.39428**
Log-likelihood	**-214.4784**	**Hannan-Quinn criteria.**	**48.18666**
F-statistic	**1.523809**	**Durbin-Watson stat**	**1.672579**
Prob(F-statistic)	**0.291643**		

**Program eviews10*
Notes from the Table 8
H0: Homogeneity of error variance Prob> 0.05.
H1: There is no uniformity in the error variance Prob> 0.05.

From the Table 8 F-statistic Prob (0.2916)> (0.05) we take the null hypothesis that the error variance is homogeneous.

Obs * R-squared Prob (0.2196)> (0.05) We take the assumption that there is no homogeneity in the error variance**.**

The First Hypothesis

We take the null hypothesis H0. There is a direct relationship between the price index and exports, but we note that the R-squared was 0.414575, which indicates that only 41% represents the change in the price index for the change in exports.

4.2 The Second Equation

IM= C * PI

Table 9. "Dependent Variable: IM"

Dependent Variable: IM
Method: Least Squares
Date: 11/30/23 Time: 23:47
Sample: 2006 2016
Included observations: 11

Variable	Coefficient	Standard Error	t-Statistic	Prob.
C	282317.8	1259693.	0.224116	0.0277
PI	33848.37	12396.13	2.730559	0.0232

R-squared	0.453085	Mean dependent var	3689310.
Adjusted R-squared	0.392317	S.D. dependent var	736962.4
S.E. of regression	574491.8	Akaike info criterion	29.52332
Sum squared resid	2.97E+12	Schwarz criterion	29.59567
Log-likelihood	-160.3783	Hannan-Quinn criteria.	29.47772
F-statistic	7.455952	Durbin-Watson stat	0.794550
Prob(F-statistic)	0.023203		

**Program eviews10*
Notes from the Table 9
H0: The model is inappropriate.
H1: The model is suitable.

From the Table 9 Prob (F-statistic) (0.023203) is below the significant level (0.05). That is, the F-statistic has a significant sign, and the alternative hypothesis was accepted. Thus, we say that 45.3% of the change in imports is due to the independent operator, Pl.

The Prob for (PI) is less than (0.05); that is, (PI) has a significant significance, and the alternative hypothesis was taken.

The fixed Prob (0.0277) (c) is less than (0.05), meaning that there is a significant significance for (c), and the alternative hypothesis was taken.

In conclusion, the model is appropriate in estimating the relationship between the consumer price index for foodstuffs and food exports according to the following formula:

IM = 282317.823055 + 33848.36881*PI

Table 10. "Breusch-Godfrey Serial Correlation LM Test"

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	1.356929	Prob. F(2,7)	0.3177
Obs*R-squared	3.073181	Prob. Chi-Square(2)	0.2151

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/30/23 Time: 23:49
Sample: 2006 2016
Included observations: 11
Pre sample missing value lagged residuals set to zero.

Variable	Coefficient	Standard Error	t-Statistic	Prob.
C	-225664.2	1234916.	-0.182737	0.8602
PI	2623.781	12219.94	0.214713	0.8361
RESID(-1)	0.556684	0.403290	1.380355	0.2099
RESID(-2)	0.052753	0.418778	0.125969	0.9033

R-squared	0.279380	Mean dependent var	9.52E-11
Adjusted R-squared	-0.029457	S.D. dependent var	545010.8
S.E. of regression	552979.7	Akaike info criterion	29.55932
Sum squared resid	2.14E+12	Schwarz criterion	29.70401
Log-likelihood	-158.5762	Hannan-Quinn criteria.	29.46811
F-statistic	0.904620	Durbin-Watson stat	1.780356
Prob(F-statistic)	0.485530		

**Program eviews10*
Notes from the Table 10
H0: If Prob> (0.05), there is no self-correlation.
H1: If Prob <(0.05), there is a self-correlation.

From the Table 10 F-statistic Prob (0.3177)> (0.05) we take the null hypothesis. There is no self-correlation.

Obs * R-squared Prob (0.2151)> (0.05), and the null hypothesis was taken, that there is no self-correlation.

Heteroskedasticity Test: ARCH

Table 11. "Heteroskedasticity Test: ARCH"

Heteroskedasticity Test: ARCH

F-statistic	0.309220	Prob. F(2,6)	0.7451
Obs*R-squared	0.840978	Prob. Chi-Square(2)	0.6567

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/30/23 Time: 23:51
Sample (adjusted): 2008 2016
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	4.13E+11	2.06E+11	2.005335	0.0917
RESID^2(-1)	-0.235012	0.394000	-0.596477	0.5727
RESID^2(-2)	-0.243094	0.401249	-0.605842	0.5668

R-squared	0.093442	Mean dependent var	2.89E+11
Adjusted R-squared	-0.208744	S.D. dependent var	3.60E+11
S.E. of regression	3.96E+11	Akaike info criterion	56.50666
Sum squared resid	9.39E+23	Schwarz criterion	56.57240
Log likelihood	-251.2800	Hannan-Quinn criteria.	56.36479
F-statistic	0.309220	Durbin-Watson stat	2.260531
Prob(F-statistic)	0.745052		

**Program eviews10*
Notes from the Table 11
H0: Homogeneity of error variance Prob> 0.05.
H1: No homogeneity in error variance Prob> 0.05.

From the Table 11 F-statistic Prob (0.7451)> (0.05) We take the null hypothesis that the error variance is homogeneous.
Obs * R-squared Prob (0.6567)> (0.05) We take the null hypothesis that the error variance is homogeneous.

The Second Hypothesis
We take H0 null imposition. There is a direct relationship between the price index and imports, but R-squared is 0.453085; in other words, only 45% represents the change in the price index and the change in exports.

4.3 The Third Equation
Q= C * PI

Table 12. "Dependent Variable: Q"

Dependent Variable: Q
Method: Least Squares
Date: 11/30/23 Time: 23:53
Sample: 2006 2016
Included observations: 11

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2243.558	546.3529	-4.106427	0.0027
PI	34.09839	5.376439	6.342190	0.0001

R-squared	0.817160	Mean dependent var	1188.600
Adjusted R-squared	0.796844	S.D. dependent var	552.8127
S.E. of regression	249.1680	Akaike info criterion	14.03710
Sum squared resid	558762.5	Schwarz criterion	14.10944
Log-likelihood	-75.20404	Hannan-Quinn criteria.	13.99149
F-statistic	40.22337	Durbin-Watson stat	0.551199
Prob(F-statistic)	0.000134		

**Program eviews10*
***Notes** from the Table 12*
H0: The model is inappropriate.
The model is appropriate.

From the Table 12 Prob (F-statistic) (0.000134) is below the significant level (0.05). That is, F-statistic has an important sign, and we take in the alternative hypothesis, and thus we say that 81.7 (%) of the change in output is due to the independent factor Pl.

The Prob for the independent variable (0.0001) (PI) is less than the significance level (0.05), meaning that there is a significant significance for (PI), and we take the alternative hypothesis.

The fixed Prob (0.0027) (c) is less than the significance level (0.05), meaning that there is a significant significance for (c), and we take the alternative hypothesis.
In conclusion, according to the following formula, the model is appropriate for estimating the relationship between the consumer price index for foodstuffs and food exports.

Q = -2243.5584134 + 34.0983946418*PI

Table 13. "Breusch-Godfrey Serial Correlation LM Test"

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	5.139866	Prob. F(2,7)	0.0423
Obs*R-squared	6.543912	Prob. Chi-Square(2)	0.0379

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 11/30/23 Time: 23:55
Sample: 2006 2016
Included observations: 11
Pre sample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-79.95997	445.1188	-0.179637	0.8625
PI	0.860745	4.559511	0.188780	0.8556
RESID (-1)	1.213297	0.380475	3.188898	0.0153
RESID (-2)	-0.711773	0.520409	-1.367718	0.2137

R-squared	0.594901	Mean dependent var	5.68E-14
Adjusted R-squared	0.421287	S.D. dependent var	236.3816
S.E. of regression	179.8229	Akaike info criterion	13.49711
Sum squared resid	226354.0	Schwarz criterion	13.64180
Log-likelihood	-70.23411	Hannan-Quinn criteria.	13.40590
F-statistic	3.426577	Durbin-Watson stat	1.652928
Prob(F-statistic)	0.081420		

**Program eviews10*
Notes from the Table 13
H0: If Prob> (0.05), there is no self-correlation.
H1: If Prob < (0.05), there is a self-correlation.

From the Table 13 F-statistic Prob (0.0423) < (0.05) Taking the alternative hypothesis. There is a self-correlation.
Obs * R-squared Prob (0.0379) < (0.05) Take the alternative hypothesis. There is a self-correlation.

Table 14. "Heteroskedasticity Test: ARC"

F-statistic	1.138083	Prob. F (2,6)	0.3810
Obs*R-squared	2.475240	Prob. Chi-Square (2)	0.2901

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 11/30/23 Time: 22:55
Sample (adjusted): 2008 2016
Included observations: 9 after adjustments

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	68735.97	51676.45	1.330122	0.2318
RESID^2(-1)	0.713737	0.963903	0.740466	0.4870
RESID^2(-2)	-1.208072	1.074231	-1.124593	0.3037

R-squared	0.275027	Mean dependent var	58634.34
Adjusted R-squared	0.033369	S.D. dependent var	79712.20
S.E. of regression	78370.96	Akaike info criterion	25.63750
Sum squared reside	3.69E+10	Schwarz criterion	25.70324
Log-likelihood	-112.3687	Hannan-Quinn criteria.	25.49563
F-statistic	1.138083	Durbin-Watson stat	0.975076
Prob(F-statistic)	0.381036		

**Program eviews10*
Notes from the Table 14
H0: Homogeneity of error variance Prob> 0.05
H1: No homogeneity in error variance Prob> 0.05

From the Table 14 F-statistic Prob (0.3810)> (0.05) we take the null hypothesis. The error variance is homogeneous.
Obs * R-squared Prob (0.2901)> (0.05) Taking the null hypothesis that the error variance is homogeneous.

The Third Hypothesis
We take the null hypothesis H0, a direct relationship between the price index and imports, but R-squared reached 0.817160. 82% of the change in GDP at current prices was responsible for the change in the price index.

5 Discuss the Results of the Study

5.1 The First Hypothesis
We take the null hypothesis H0. There is a direct relationship between the price index and exports, but we note that the R-squared was 0.414575, which indicates that only 41% represents the change in the price index for the change in exports.
There are 59% represented by other factors, including the availability of rain and water reserves, the lack of harvest yields, or factors related to commercial relations and the conditions of neighboring countries.

5.2 The Second Hypothesis
We take H0 null imposition. There is a direct relationship between the price index and imports, but R-squared is 0.453085. In other words, only 45% represents the change in the price index, the change in exports, and 55% represents other factors, including foreign trade, the increase in the population as a result of wars in neighboring countries, the increase in IDPs, which required an increase in food and other factors.

5.3 The Third Hypothesis
We take the null hypothesis H0, a direct relationship between the price index and imports, but R-squared reached 0.817160. 82% of the change in GDP at current prices was responsible for the change in the price index. This result indicates that the output was increasing due to the increase in prices. As for the quantities, the increase was 19%.

This is an interpretation that corresponds to the GDP's economic logic at current prices, where each year of production is estimated at prices for that year, which leads to a strong direct relationship between them.

6 Recommendations
1-Finding direct support for citizens considering the conditions of rising prices and increasing immigrants.
2-Focusing on production and quantities of foodstuffs, with an increase in the rate of imports.
3-Supporting the agricultural product in the production of vegetables and fruits.
4-The use of modern technologies in agriculture.
5-Consolidating foreign trade relations and opening new markets.

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Contribution of Individual Authors to the Creation of a Scientific Article (Ghostwriting Policy)

Thiabat Adnan is the main author, Abdul Baqi Reem, Al-Nabulsi Manwa, Bataineh Ashraf are co-authors who contribute to the consultation, methodology, data analysis, final solution, and overview of research.

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Conflict of Interest

The authors have no conflicts of interest to declare.

APPENDIX

Table 1. The Relative Importance of the Consumer Price Index, Basis 2010 (2006-2019)

	Relative importance		**Relative importance**
Home maintenance services	0.39	1)Food and non-alcoholic Beverages	33.36
Water and Sanitation	1.11	Food Items	30.51
Fuels and Lighting	4.85	Cereals and Products	4.99
5)Household Furnishings and Equipment	4.19	Meat and Poultry	8.24
Furniture, Rugs, and Bedspreads	0.97	Fish and Sea Products	0.82
Home Textiles	0.1	Dairy Products and Eggs	4.23
Household appliances	0.72	Oils and Fats	1.92
Housewares	0.27	Fruits and Nuts	2.73
Home Maintenance	2.13	Vegetables and Legumes Dry and Canned	3.89
6) health	2.21	Sugar and its Products	2.77
7) Transportation	13.58	Spices and food additives, other food	0.91
8) Communication	3.5	Non-alcoholic beverages	2.86
9) Culture and Recreation	2.27	Tea, Coffee, and Cocoa	1.42
10) Education	5.41	Drinks and Refreshments	1.44
11) Restaurants and Hotels	1.83	2) Alcohol and Tobacco and Cigarettes	4.43
12) Other Goods and Services	3.75	Alcoholic beverages	0.03
Personal Care	2.67	Tobacco and Cigarettes	4.4
Personal Effects	0.4	3) Clothing and footwear	3.55
Insurance connected with Transport	0.26	Clothing	2.79
Contribute to the Unions	0.02	Footwear	0.76
Other Services	0.39	4) housing	21.92
All Items	100	Rents	15.57

Source: General Statistics. Indices

Table 2. Consumer price index for food and non-alcoholic beverages from 2006-2016 for the base year 2010 for each month

Average	1	2	3	4	5	6	7	8	9	10	11	12	Year
71.7	69.35	68.27	68.28	69.73	72.02	71.29	70.81	71.4	73.46	74.17	74.93	76.77	2006
78.5	78.05	77.96	78.69	78.33	77.08	76.32	75.76	76.34	79.1	79.62	81.41	83.81	2007
94.1	85.07	89.95	91.89	93.33	91.91	90.51	93.59	96.3	101.02	99.47	99.06	96.89	2008
95.7	96.5	96.13	95.84	94.82	94.49	92.89	92.75	97.13	98.16	95.84	96.47	97.11	2009
100.0	98.38	99.24	99.2	99.66	97.59	97.45	97.53	99.12	101.66	103.42	102.51	104.36	2010
104.2	103	101.63	102.7	104.69	104.59	103.61	103.52	104.97	105.1	105	105.42	106.57	2011
109.0	106.59	105.24	105.98	109.42	108.64	107.33	109.24	111.14	111.2	111.65	110.61	110.78	2012
113.6	111.83	112.72	112.96	114.12	112.2	112.79	114.18	114.15	114.45	115.13	114.03	114.62	2013
114.0	114.62	114.75	114.97	114.77	112.3	111.18	112.2	113.35	114.48	114.66	114.87	115.41	2014
115.2	116.3	114.66	115.1	114.63	114.76	114.82	113.16	115.51	116.96	117.43	114.73	114.87	2015
111.2	113.48	111.08	111.16	111.65	110.85	108.88	112.91	113.71	111.41	110.5	108.99	110.24	2016

Source General Statistics, Price Indices

Table 3. Quantities of food commodities exported according to food groups 2006-2016 in tons

No	Food article	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
1	**Cereals and Products**	20,845	118,492	40,955	34,590	29,805	18,119	35,782	57,154	18,179	33,765	33,844
2	**Starchy Roots**	15,543	20,190	29,964	11,750	13,135	7,805	16,217	18,300	15,578	26,137	17,404
3	**Sugar and Sweeteners**	23,556	7,017	5,969	6,030	4,035	3,204	8,211	14,698	11,984	6,364	7,732
4	**Pulses**	5,803	13,221	12,697	7,163	8,541	12,191	9,335	9,714	6,612	5,224	4,482
5	**Nuts**	597	509	487	649	511	374	387	586	452	212	383
6	**Oil Crops**	15,007	15,651	12,292	17,973	8,396	10,556	10,112	18,792	10,783	15,763	7,568
7	**Vegetable Oils**	3,800	4,650	8,320	8,247	13,481	14,037	6,292	34,631	14,002	20,870	113,984
8	**Vegetables**	609,527	706,096	776,744	812,897	702,462	760,922	697,886	751,879	681,116	687,975	540,229
9	**Fruits and Products**	86,085	85,134	39,521	33,539	50,796	44,686	49,062	46,068	36,575	34,325	32,302
10	**Stimulants**	7,482	4,354	3,423	4,826	3,938	4,302	3,748	4,487	2,673	2,834	2,983
11	**Spices**	1,151	5,145	615	758	887	455	2,405	347	2,712	2,270	2,053
12	**Non-Alcoholic Beverages**	34,747	48,593	53,513	123,374	50,263	24,682	12,085	27,079	51,846	36,699	2,664
13	**Animal Meats**	17,910	26,807	22,276	31,979	31,378	29,190	43,541	37,207	23,976	7,443	11,021
14	**CarassOffals Edible**	311	102	74	375	355	355	189	505	0	16	0
15	**Animal Fats**	235	845	80	78	30	287	39	97	266	93	225
16	**Milk**	0	0	0	0	0	0	0	0	0	0	0
17	**Milk Products**	11,211	10,174	9,208	7,867	4,718	7,063	13,442	16,447	12,864	6,410	18,871
18	**Eggs**	1,569	2,148	1,326	1,133	1,484	4,183	9,377	6,321	6,355	3,582	1,904
19	**Sea Foods**	434	1,318	724	1,963	4,532	2,668	1,672	3,811	1,931	354	962
	Total	855,812	1,070,446	1,018,188	1,105,191	928,747	945,078	919,781	1,048,123	897,904	890,336	798,611

*Source: General statistics, agricultural food budget, quantities of food commodities, * Includes exports and re-exports.*

Table 4. Quantities of imported food commodities according to food groups 2006-2016 in tons

N.	Food Material	2016	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006
1	Cereals and Products	3,206,393	2,975,900	3,349,609	2,615,517	2,459,969	2,322,523	1,475,874	2,022,628	2,082,629	2,275,905	2,313,861
2	Starchy Roots	106,456	99,496	111,814	139,303	85,432	64,489	61,849	45,958	62,704	50,983	44,180
3	Sugar and Sweeteners	360,841	336,814	368,306	343,462	337,937	279,205	307,784	238,753	321,514	281,827	263,442
4	Pulses	63,779	69,601	64,727	63,204	59,133	60,296	52,233	51,139	55,847	49,920	49,584
5	Nuts	16,642	18,028	12,408	14,866	12,662	13,493	14,157	13,952	11,337	12,296	10,285
6	Oil Crops	63,422	55,742	47,693	44,498	37,245	35,951	34,408	32,426	25,356	29,729	29,556
7	Vegetable Oils	165,582	149,409	146,341	136,537	133,571	122,663	103,950	123,908	77,314	91,171	165,313
8	Vegetables	82,825	63,039	102,423	101,823	86,496	77,892	84,641	86,327	75,174	67,004	58,715
9	Fruits and Products	198,311	201,002	215,710	216,831	183,357	179,500	142,456	144,251	118,347	115,224	87,664
10	Stimulants	51,000	35,978	35,514	48,181	37,277	33,377	34,784	35,974	33,258	29,597	24,777
11	Spices	10,031	10,399	7,355	8,199	7,014	5,860	5,360	4,896	5,026	6,136	5,199
12	Non-Alcoholic Beverages	147,844	144,967	117,683	109,207	89,774	83,289	78,553	74,845	77,314	70,439	57,526
13	Animal Meats	131,722	158,198	145,299	148,922	129,678	115,240	111,244	96,489	85,568	73,438	66,268
14	CarassOffals Edible	1,484	1,777	2,519	2,440	1,662	1,354	1,477	1,124	706	656	735
15	Animal Fats	15,787	13,894	14,348	16,952	14,195	9,691	4,791	5,158	4,423	4,271	6,924
16	Milk	0	0	0	0	0	0	0	0	0	0	0
17	Milk Products	61,625	68,259	58,807	55,968	51,634	48,317	63,910	67,251	43,748	43,528	42,261
18	Eggs	1,061	1,513	336	1,946	1,465	872	1,146	824	698	33	0
19	Sea Foods	33,026	32,827	29,120	20,701	32,678	38,589	23,745	28,839	26,633	20,746	21,497
	Total	4,717,830	4,436,840	4,830,013	4,088,558	3,761,179	3,492,601	2,602,362	3,074,742	3,107,596	3,222,903	3,247,786

Source: General statistics, agricultural food budget, quantities of food commodities

Table 5. GDP at current prices from 2006-2016

Agricultural sector output		**Gross domestic product**		**Year**
In a million dollars	In a million dinars	In a million dollars	In a million dinars	
371.9	264.0	15,036	10,675.4	2006
477.3	338.9	17,086	12,131.4	2007
745.1	529.0	22,192	15,756.0	2008
908.5	645.0	23,944	17,000.0	2009
1109.9	788.0	26,520	18,829.0	2010
1184.5	841.0	28,907	20,524.0	2011
1195.8	849.0	30,935	21,964.0	2012
1412.7	1,003.0	33,617	23,868.0	2013
1673.2	1,188.0	36,051	25,596.0	2014
1939.4	1,377.0	37,923	26,925.0	2015
2056.3	1,460.0	39,197	27,830.0	2016

Source: General Statistics, National Accounts, Annual Estimates of the Fourth Revision (ISIC4) Base year 2016
The dollar = 0.71 / dinar