STANDARD ESTIMATE OF THE IMPACT OF EXCHANGE RATE LIBERALIZATION ON AGRICULTURAL FOREIGN TRADE OF THE MOST IMPORTANT GLOBAL BLOC

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Abstract

The objective of this study how to explain the impact of the exchange rate for the Egyptian agricultural imports and exports which imported and exported the European Union and Arab States during the period (April 2014 - May 2019), in order to determine the nature of the relationship and to determine the extent of using the exchange rate as a tool of economic policy in Egypt, in addition to knowing the extent of Economy. With the economic theory that the decline in the exchange rate leads to reduce the deficit in the trade balance, where tests have been made to ensure a long-term relationship between variables occurring in the dollar exchange rate on agricultural imports or exports of the bloc. So the exchange rate affects the agricultural imports and exports of both the EU bloc and the Arab League, where the stability of the time series of all variables has been tested. The stability of residue chains was performed, where the stability of residue chains for all study variables and their integration of zero degree was found, showing a common integration relationship between the exchange rate and Imports or agricultural exports to the bloc. On the other hand, the European Union and the Arab League to measure the degree of correlation between the exchange rate and agricultural imports or exports of these models, the method of minimizing the least squares (Ordinary Least Square) was adopted by using the program (E-Views 6). In the study the European Union and the Arab League taken as a dependent variable during the period (April 2014-May 2019). The results of the study showed an inverse relationship between the exchange rate and the agricultural imports of both the EU bloc and the Arab League, while the relationship between the exchange rate and the agricultural exports of both the bloc and the Arab League was consistent. On the basis of economic theory, when the exchange rate increases, the value of the Egyptian pound depreciates and this leads to lower costs of domestic production elements for the outside world, which leads to lower domestic prices compared to world prices, which makes the prices of agricultural exports relatively cheap, and thus increase for Egyptian agricultural exports and gap in and agricultural trade balance is reduced.

The impact of exchange rate liberalization on the agricultural balance of the EU bloc also showed that agricultural imports from the bloc decreased by about 20.8% before the exchange rate liberalization, while agricultural exports increased by about 15.2% from before the price liberalization. Thus, the effect was positive on achieving a surplus in the agricultural balance with the bloc of the European Union amounted to about 12.73 million dollars, while the surplus was about 67.35 million dollars with the Arab League after the liberalization of the exchange rate of the dollar against the pound the following is recommended:

1- There was an inverse relationship between the exchange rate and the agricultural imports of both the EU bloc and the League of Arab States, where the increase of the exchange rate by 1% leads to a decline in agricultural imports by a decrease of about 0.4%, 0.3% for both the bloc of the European Union and the Arabic League States respectively.

2- It was found that there is a direct relationship between the exchange rate and the agricultural exports of both the EU bloc and the Arab League. The increase of the exchange rate by 1% leads to an increase of agricultural exports by an increase of about 0.2%, 0.1% for both the bloc of the European Union and the League of States. The results are consistent with economic theory.

3- Not to repeat the devaluation of the Egyptian pound for a long time so as not to lose the confidence of foreign investors in the currency of the Egyptian pound, the need to take the necessary political measures towards the negative effects that can occur as a result of the devaluation of the Egyptian pound against the US dollar.

4- Rationalizing foreign imports of consumer goods, and looking for reasons that led to an increase in agricultural imports in 2018 after a decline in 2017, where it showed an increase in agricultural imports by 15.5% and a decline in agricultural exports by 0.4%, as well as an increase in agricultural imports from the European Union and the League of States Arab exports decreased by about 6% and 20.1% respectively, while the agricultural exports of the European Union and the League of Arab States decreased by 4.1% and 7.6% respectively from 2017.

Keywords: Exchange rate - Agricultural exports and imports - European Union - League of Arab States - Self-correlation - Partial correlation - Causal relationship - Granger causation - Natural distribution - Heterogeneity of variance.

Introduction

Agriculture is the main pillar of any nation's economy along with other associated economic variables regarding the performance of the country. Previous study literature had concluded that discriminatory policies would enhance trade protection and secure domestic infant agricultural firms' produce in the region (Bhagwati 1993; Bond *et al*., 2012; Matsuyama 2019; Tumwebaze and Ijjo, 2015). At regional level it has been observed that, same commodity is subjected to different duty rates across borders, might need to be reconsidered to lower transaction costs within the region. Similarly, the region needs to consider the sizeable population as potential to increase economies of scale with attention to effective and efficient utilization of resources in order to benefit from regional trade.

Nowadays, the international trade is also influenced by various policies that effect the specific economic areas. On the other hand, to simulate the national imports and exports in the gross domestic product governmental authorities adopt widely measures to stimulate direct foreign investments. In addition exchange rate and liberalization is very important for International trade that have very deep influence on country economy, finance, market and determine import and export volume.

It is observed that in some of the studies the exchange rate had negative effect on International trade flow between developed and developing countries. In the year 2008 (Kandilov) reported the same study and found that the impact was larger in agricultural trade as compared to other sectors. Furthermore, he found a larger impact of exchange rate volatility on exports from developing countries than on

exports from developed countries. Similarly, other researchers (e.g. Wang and Barrett, 2007; and Chit *et al.*, 2010) found that exchange rate volatility has had a negative impact on trade flows. On the other hand, some researchers also found a positive impact on trade flows stemming from exchange rate volatility (Jozsef, 2011).

Therefore, the main objective the study is to determine how the exchange rate and liberalization influence the International trade of Arab League. The study is very important due to strategic economic and trade liberalization of Arab League within European Union.

Research Problem

Due to the weakness of the national economy to achieve rapid development processes due to the weak production structure on the one hand and the growing population on the other hand, the weak ability to save and invest, the deterioration of foreign trade conditions and the occurrence of fluctuations in exchange rates as it reflected negatively on the national economy through the imbalance of balance of payments and balance of balance Total imports increased from about $ 44.958 billion in 2009 to about $ 69.44 billion in 2016, an increase of about 54.5%.Total exports of about 24.206 billion dollars in 2009 to about 22.58 billion dollars in 2016, decline of about 6.7% compared to 2009, also Increased trade balance deficit.

This led to some government policies, namely the liberalization of the exchange rate and the rise of the dollar against the Egyptian pound to reach about 17.81 pounds / dollar in 2018.

Research Objectives

This research aims to study the impact of exchange rate liberalization on agricultural foreign trade of the most important global blocs, through a standard assessment of the impact of exchange rate liberalization on foreign trade of the European Union and the League of Arab States during the period (April 2014-May 2019), which was divided into two periods The first period was (April 2014-October 2016), before the exchange rate liberalization, while the second period during (November 2016-May 2019) after the exchange rate liberalization was a total of 62 views, through the method of simultaneous integration by conducting several tests such as stability test Time series, Grange causality test To ensure the existence of a long-term causal relationship between the exchange rate of the Egyptian pound against the dollar and the total agricultural imports or exports of the European Union and the League of Arab States, to determine the extent of the change of agricultural imports or exports with the exchange rate change using the Ordinary Least Square (OLS) (E-Views 6), by studying:

1. Development of the value of the total agricultural foreign trade (agricultural imports and exports) and agricultural trade of the most important global blocs (European Union and the League of Arab States) during the period (2008 – 2018).

2. Development of the dollar exchange rate against the pound during the period (2008 – 2018).

3. Developing a standard model for estimating the relationship between the exchange rate and the value of agricultural foreign trade (agricultural imports and exports) of the most important global blocs (the

European Union and the Arab League) during the period (April 2014 - May 2019).

Material and Methods

The article depended on statistical analysis and econometric tools. Cross correlation, Granger Causality, a statistical test used to confirm the existence of a causal correlation, i.e the discovery of immediate internal variables, or the spurious relationship. Unit Root Test, a statistical test used when there is a subjective correlation of the first retrograde period (Ac) and is also used to check the stability of the time series and use the following tests (Augmented). Dickey – Fuller Test and Phillips - Perron Test), tests of length of slowdowns (Schwarz Bayesian Criterion (SBC), Akaike Information Criterion (AIC) and Likelihood Ratio (LR)) are used to compare two types of estimates in a number of variables or parameters, especially in determining The number of delay periods and Vector Auto Regression Test (VAR) is a model of non-structural equations used as an alternative solution for dynamic prediction of internal variables of static data only.

Data sources:

The research was based on secondary data published in many official bodies such as the Ministry of Agriculture and Land Reclamation, Foreign Trade Bulletins issued by the Central Agency for Public Mobilization and Statistics, the website of the Central Agency for Public Mobilization and Statistics, and the electronic document of the Central Bank of Egypt. And related scientific books.

Results and Discussion

Firstly timetable year trend variables during the period (2008-2018)

Otherwise when we study the evolution of the total value of Egyptian agricultural imports showed that it was increased from 4819.4 million dollars in 2008 to about 5224.6 million dollars in 2018, this increase representing about 8.4% of its value in 2008, in table (1), also the estimation of the time trend formula for the development of the total value of the Egyptian agricultural imports during the period (2018 - 2018) showed that statistically direction was significant decreasing trend of about 459 million dollars, representing about 8.5% of the average study period of about 5418 million dollars in table (2),While the total value of Egyptian agricultural exports increased from about 2089.7 million dollars in 2008 to about 2719.7 million dollars in 2018, an increase representing about 33.6% of its value in 2008, Table (1), An estimation of the time trend formula for the development of the total value of Egyptian agricultural exports during the period (2018 - 2018) showed that it took a growing trend of a statistically significant amounting to about $ 67.85 million, representing about 2.4% of the average study period of about $ 2805.5 million - Table (2). The study of the development of the total value of agricultural imports from the EU bloc showed that it increased from about 505.4 million dollars in 2008 to about 645.9 million dollars in 2018, an increase of about 27.8% from its value in 2008 - Table (1). Estimating the time trend formula for the development of the total value of agricultural imports from the EU bloc during the period (2018 - 2018), it showed that it has taken a growing trend of statistical significance of about 36.05 million dollars, which represents about 4.6% of the average period of study of about 785.4 million dollars - table.

(2). While the total value of Egyptian agricultural exports to the European Union bloc. It increased from about $ 556.1 million in 2008 to about $ 787.8 million in 2018, an increase of about 41.7% of its value in 2008 - Table (1). The estimation of the time trend formula for the development of the total value of Egyptian agricultural exports to the EU bloc during the period (2018 - 2018) showed that it took a growing trend of statistically significant amounting to about 23.56 million dollars, which represents about 3.4% of the average study period of about 699.9 million dollars –table(2).

Table 1 : the development of the agricultural balance and the agricultural balance with the bloc of the European Union and the League of Arab States in million dollars during the period (2008 – 2018)

Years	Agricultural Balance		European Union bloc		League of Arab States		Dollar exchange rate
	Agr. imports	Agr. exports	Agr. imports	Agr. exports	Agr. imports	Agr. exports	Pound/ Dollar
2008	4819.4	2089.7	505.4	556.1	160.6	828.6	5.433
2009	4389.9	2967.6	759.4	656.8	160.7	1394.4	5.545
2010	5631.8	3131.4	952.1	615.6	191.9	1395.4	5.622
2011	8210.9	3025.7	833.0	671.3	143.9	1164.1	5.933
2012	8825.4	2683.7	724.8	607.0	179.0	1148.9	6.056
2013	5132.8	2867.0	790.6	687.5	213.4	1333.8	6.870
2014	4163.0	2952.8	826.0	796.8	152.7	1353.5	7.078
2015	4100.0	2852.2	994.3	720.1	158.1	1351.9	7.726
2016	4575.8	2696.8	998.9	778.2	183.9	1188.3	10.187
2017	4524.3	2801.5	609.1	821.2	195.6	1041.9	17.810
2018	5224.6	2791.7	645.9	787.8	234.8	962.9	17.869
Average	5418.0	2805.5	785.4	699.9	179.5	1196.7	8.739
Amount of change	-459.0	67.85	36.05	23.56	6.26	-29.82	1.18
growth rate	-8.5	2.4	4.6	3.4	3.5	-2.5	13.5

Source: Compiled and calculated from: 1 - Central Agency for Public Mobilization and Statistics, Foreign Trade Bulletin, various issue, 2- The website of the Central Agency for Public Mobilization and Statistics: www.capmas.gov.eg

Table 2 : General time trend equations for study variables during the (2008-2018) (Value: US $ million}

Variable	Equation	R^2	F	Average	Growth rate
Total value of agricultural imports	$\hat{Y}_t= 8171.9 - 459.0 X_t$ $(-5.38)^{**}$	0.763	29.0^{**}	5418.0	-8.5
Total value of agricultural exports	$\hat{Y}_t= 2234.7 + 67.85 X_t$ $(2.26)^{*}$	0.363	5.1^{*}	2805.5	2.4
The value of agricultural imports from the EU bloc	$\hat{Y}_t= 605.5 + 36.05 X_t$ $(4.61)^{**}$	0.702	21.2^{**}	785.4	4.6
The value of agricultural exports of the EU bloc	$\hat{Y}_t= 558.5 + 23.56 X_t$ $(5.76)^{**}$	0.787	33.2^{**}	699.9	3.4
The value of agricultural imports from the Arab League	$\hat{Y}_t= 138.3 + 6.26 X_t$ $(2.45)^{*}$	0.401	6.0^{*}	179.5	3.5
The value of agricultural exports to the Arab League	$\hat{Y}_t= 1421 - 29.82 X_t$ $(-2.65)^{*}$	0.439	7.0^{*}	1196.7	-2.5
USD Exchange Rate (EGP / USD)	$\hat{Y}_t= 1.67 + 1.18 X_t$ $(4.48)^{**}$	0.691	20.1^{**}	8.739	13.5

Source: Compiled and calculated from: 1 - Central Agency for Public Mobilization and Statistics, Foreign Trade Bulletin, various issue,2- The website of the Central Agency for Public Mobilization and Statistics: www.capmas.gov.eg

Study of the development of the total value of agricultural imports from the Arab League showed that it increased from $ 160.6 million year 2008 to 234.8 million dollars a year 2018, this represents an increase of 46.2% of its value in 2008, from (table 1). By estimating the time trend formula for the development of the total value of agricultural imports from the Arab League during the period (2008-2018) It was found that it has taken a significant decreasing general statistical trend of about $ 29.82 million, representing about 2.5% of the average study period of about $ 1196.7 million (Table 2).

In (Table 1) the result explain the development of the dollar exchange rate against the pound showed that it increased from about 5.433 pounds / dollar in 2008 to about 17.869 pounds / dollar in2018 The increase represents about 228.9% of its value in 2008 from (table 1). by estimating the time trend equation of the evolution of the exchange rate of the dollar against the pound during the period (2008-2018). It was found that it has taken a growing trend of statistical significance of about 1.18 pounds / dollar, which represents about 13.5% of the average study period of about 8.739 pounds / dollar from Table (2)

Table 3 : Evolution of the Exchange Rate and the Value of Foreign Trade of the EU Bloc in Million Dollars during the Period (April 2014 - May 2019)

Month	(November 2016-May 2019)			Month	(April 2014 - October 2016)		
	Agr. exports	Agr. imports	Exchange rate		Agr. exports	Agr. imports	Exchange rate
Nov. 2016	40.93	93.29	18.146	Apr.2014	71.80	32.59	7.150
Dec. 2016	69.86	134.10	18.411	May 2014	129.04	22.57	7.150
Jan. 2017	71.49	68.82	14.411	June 2014	138.14	44.36	7.150
Feb. 2017	100.31	68.90	15.884	July 2014	28.48	43.29	7.150
March 2017	117.09	51.54	18.201	Aug. 2014	19.45	42.45	7.150
April 2017	82.32	50.62	18.142	Sept. 2014	24.80	58.47	7.150
May 2017	81.00	42.22	18.142	Oct.2014	25.36	88.49	7.150
June 2017	118.55	20.15	18.152	Nov. 2014	33.82	147.37	7.150
July 2017	64.53	23.02	17.949	Dec. 2014	60.56	148.60	7.150
Aug. 2017	22.70	41.67	17.827	Jan. 2015	54.60	158.89	7.470
Sept. 2017	16.83	20.02	17.724	Feb.2015	61.69	75.83	7.540
Oct.2017	35.61	33.02	17.685	March 2015	85.73	72.90	7.540
Nov. 2017	45.26	94.89	17.728	April 2015	76.20	66.48	7.540
Dec. 2017	65.81	96.42	17.836	May 2015	98.45	51.23	7.540
Jan. 2018	77.57	37.12	17.765	June 2015	151.13	39.57	7.540
Feb. 2018	76.97	54.60	17.703	July 2015	38.92	56.71	7.740
March 2018	118.00	35.79	17.690	Aug. 2015	22.76	49.00	7.740
April 2018	84.63	28.35	17.747	Sep. 2015	16.99	72.59	7.740
May 2018	154.47	27.21	17.865	Oct. 2015	24.73	90.76	7.940
June 2018	78.17	28.66	17.932	Nov. 2015	31.77	118.22	7.740
July 2018	33.11	37.44	17.951	Dec.2015	62.31	141.73	7.740
Aug.2018	17.55	32.45	17.936	Jan. 2016	55.40	90.03	7.740
Sept. 2018	19.54	33.55	17.960	Feb.2016	80.59	112.75	7.740
Oct. 2018	21.90	74.75	17.946	March 2016	113.16	99.04	8.790
Nov. 2018	33.40	129.50	17.974	April 2016	85.52	73.16	8.790
Dec.r 2018	74.22	125.44	17.956	May 2016	138.83	55.33	8.790
Jan. 2019	74.05	70.82	17.892	June 2016	118.13	39.94	8.790
Feb. 2019	97.63	79.31	17.629	July 2016	28.77	55.32	8.790
March 2019	116.42	72.59	17.434	Aug.2016	19.90	46.70	8.790
April 2019	112.51	78.58	17.334	Sep.2016	16.11	49.99	8.790
May 2019	118.10	61.46	17.072	Oct. 2016	31.74	87.26	8.790
Average	72.27	59.56	17.678	Average	62.74	75.21	7.805

Source: Compiled from the Central Agency for Public Mobilization and Statistics website www.capmas.gov.eg

Second: The Standard Estimation of the Model of the Exchange Rate Impact on Agricultural Imports and Exports of the European Union and the League of Arab States during April 2014-May 2019:

The trade balance has a direct correlation with the exchange rate, where the increase in the dollar exchange rate against the pound leads to a decrease in domestic prices and a rise in foreign prices, which leads to a decrease in domestic demand for foreign goods. Increasing domestic and foreign demand for domestic goods, thus increasing total exports and reducing the trade balance, the standard model for agricultural imports or exports of the EU and the Arab League bloc was estimated during the period (April 2014-

May 2019) - Tables (3,4), assuming a linear relationship between the dependent variable and the independent variable with the following mathematical image:-

$$\hat{Y}_1 = a + b X + e$$

$$\hat{Y}_2 = a + b X + e$$

$\hat{Y}_1$ = Agricultural imports from the bloc of the European Union or the League of Arab States.

$\hat{Y}_2$ = Agricultural exports to the EU or Arab League bloc.

a = Constant   b = slope that determines the relationship between variables

X = dollar to pound exchange rate   e = random error

Table 4: Development of the value of agricultural foreign trade of the Arab League in million dollars during the period (April 2014 - May 2019)

	Agricultural exports	Agricultural imports		Agricultural exports	Agricultural imports
November 2016	80.08	10.76	April 2014	108.09	6.87
December 2016	128.48	11.96	May 2014	102.95	5.20
January 2017	107.76	16.98	June 2014	149.63	5.96
February 2017	109.60	24.74	July 2014	72.31	12.05
March 2017	101.85	23.43	August 2014	78.34	8.68
April 2017	89.66	17.27	September 2014	95.90	13.71
May 2017	87.47	10.01	October 2014	87.60	23.90
June 2017	69.98	5.31	November 2014	95.33	17.46
July 2017	63.07	12.12	December 2014	149.72	20.07
August 2017	77.16	15.98	January 2015	123.86	15.11
September 2017	56.19	12.73	February 2015	126.41	21.30
October 2017	81.85	26.23	March 2015	149.44	26.35
November 2017	90.82	17.28	April 2015	110.30	14.44
December 2017	108.16	14.66	May 2015	119.32	9.88
January 2018	99.96	22.78	June 2015	104.81	4.70
February 2018	94.86	19.66	July 2015	86.09	9.81
March 2018	94.91	23.05	August 2015	93.89	13.23
April 2018	85.11	13.23	September 2015	82.27	11.04
May 2018	81.48	12.72	October 2015	101.97	14.82
June 2018	65.17	15.32	November 2015	110.67	8.40
July 2018	81.94	23.93	December 2015	144.77	9.32
August 2018	47.39	16.64	January 2016	127.38	10.13
September 2018	69.74	24.29	February 2016	128.44	18.37
October 2018	66.49	21.43	March 2016	130.32	18.44
November 2018	70.33	19.97	April 2016	109.66	14.22
December 2018	106.18	21.78	May 2016	110.50	9.72
January 2019	95.22	23.32	June 2016	84.06	13.05
February 2019	101.70	29.33	July 2016	60.19	17.69
March 2019	89.83	24.88	August 2016	80.33	19.76
April 2019	90.27	19.43	September 2016	65.85	23.62
May 2019	65.04	18.70	October 2016	77.89	24.51
Average	85.73	18.38	Average	105.43	14.25

Source: Compiled from: Central Agency for Public Mobilization and Statistics website www.capmas.gov.eg.

The standard method of estimating the impact of the exchange rate on Egyptian agricultural imports or exports to the European Union and the Arab League bloc during the period (April 2014-May 2019) goes through several steps

1. Time Series Stability Test (Augmented Dickey Fuller test)

Corrologram testing of the exchange rate, agricultural imports and exports of the EU and the Arab League bloc showed that they all suffer from the problem of instability at zero level - Figures (1,3,5,7,9), But it becomes stable when the first difference is made on the root of the unit, that is, the variables become first order integral, This means that time series move together over time, meaning that the probability of a unit root is nil, It is also noted that the calculated values are smaller than the tabular values at the level of significance 0.05, and therefore reject the imposition of nothingness H0 (Null Hypothesis), and acceptance of alternative hypothesis (Alternative Hypothesis) H1, where it was found after the first difference (D1) The stability of the exchange rate, agricultural imports and exports time series of the bloc of the European Union and the League of Arab States during the period (April 2014-May 2019) - Figures (2,4,6,8,10).
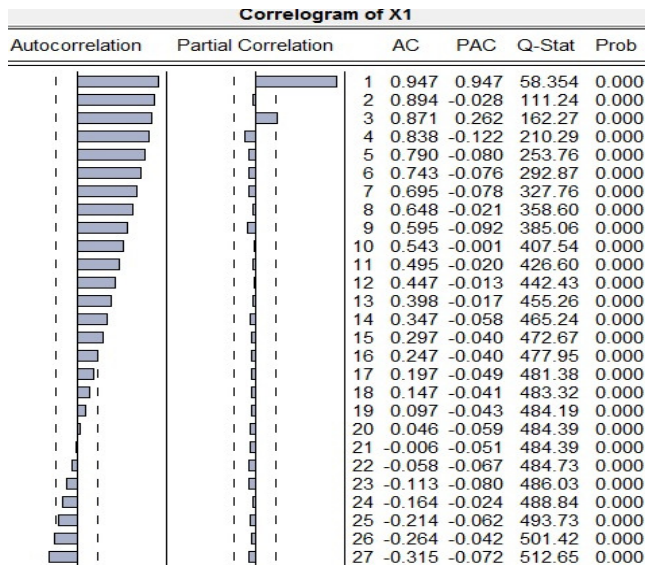
Correlogram of X1

	AC	PAC	Q-Stat	Prob
1	0.947	0.947	58.354	0.000
2	0.894	-0.028	111.24	0.000
3	0.871	0.262	162.27	0.000
4	0.838	-0.122	210.29	0.000
5	0.790	-0.080	253.76	0.000
6	0.743	-0.076	292.87	0.000
7	0.695	-0.078	327.76	0.000
8	0.648	-0.021	358.60	0.000
9	0.595	-0.092	385.06	0.000
10	0.543	-0.001	407.54	0.000
11	0.495	-0.020	426.60	0.000
12	0.447	-0.013	442.43	0.000
13	0.398	-0.017	455.26	0.000
14	0.347	-0.058	465.24	0.000
15	0.297	-0.040	472.67	0.000
16	0.247	-0.040	477.95	0.000
17	0.197	-0.049	481.38	0.000
18	0.147	-0.041	483.32	0.000
19	0.097	-0.043	484.19	0.000
20	0.046	-0.059	484.39	0.000
21	-0.006	-0.051	484.39	0.000
22	-0.058	-0.067	484.73	0.000
23	-0.113	-0.080	486.03	0.000
24	-0.164	-0.024	488.84	0.000
25	-0.214	-0.062	493.73	0.000
26	-0.264	-0.042	501.42	0.000
27	-0.315	-0.072	512.65	0.000

Fig. 1 : Retroactive and Partial Exchange Rate Correlations at Zero Level

Correlogram of D(X2)

	AC	PAC	Q-Stat	Prob
1	-0.013	-0.013	0.0106	0.918
2	-0.042	-0.042	0.1246	0.940
3	-0.100	-0.102	0.7901	0.852
4	-0.038	-0.044	0.8888	0.926
5	-0.100	-0.111	1.5699	0.905
6	-0.251	-0.277	5.9602	0.428
7	-0.115	-0.174	6.9054	0.439
8	-0.046	-0.145	7.0602	0.530
9	-0.101	-0.257	7.8089	0.554
10	-0.024	-0.220	7.8508	0.643
11	0.164	-0.053	9.9276	0.537
12	0.423	0.281	23.946	0.021
13	0.070	0.055	24.341	0.028
14	-0.037	-0.029	24.454	0.040
15	-0.008	0.014	24.459	0.058
16	-0.021	-0.007	24.495	0.079
17	-0.109	-0.032	25.533	0.083
18	-0.178	-0.021	28.361	0.057
19	-0.118	-0.053	29.643	0.057
20	-0.017	0.011	29.669	0.075
21	-0.024	0.056	29.726	0.098
22	-0.142	-0.204	31.703	0.083
23	0.251	0.068	38.095	0.025
24	0.267	0.091	45.487	0.005
25	0.083	0.016	46.226	0.006
26	-0.047	-0.026	46.473	0.008
27	-0.090	-0.135	47.385	0.009

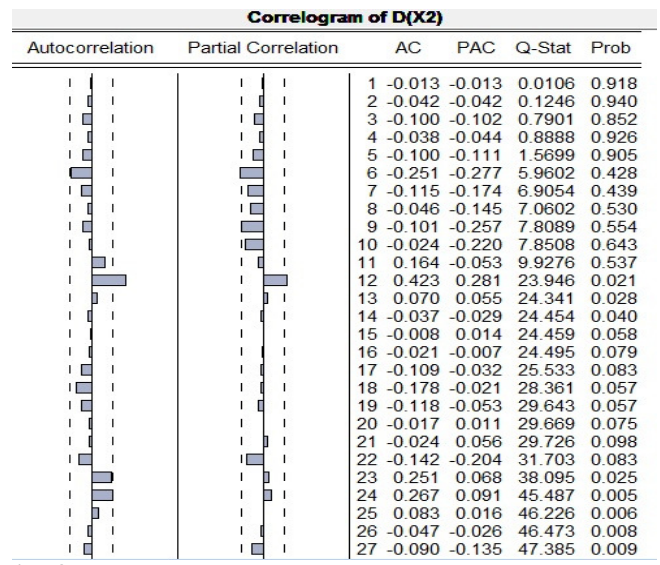**Fig. 4 :** Retroactive Commitments and Partial Commitments of Agricultural Imports from the EU Bloc at the First Difference

Correlogram of D(X1)

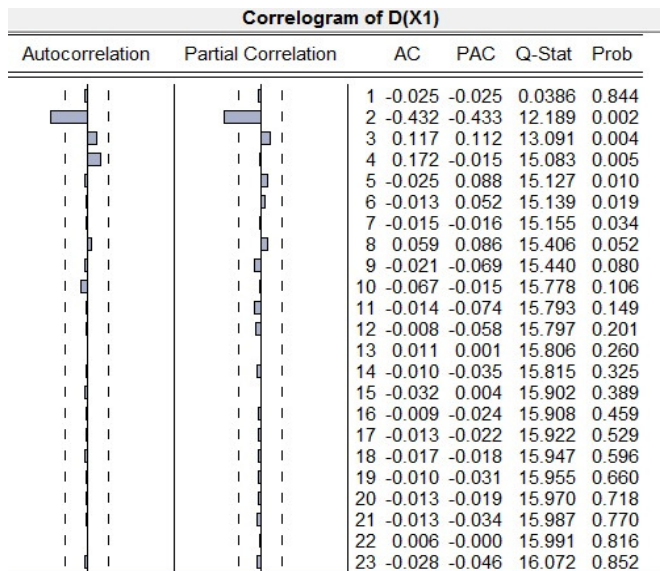|	AC	PAC	Q-Stat	Prob
1	-0.025	-0.025	0.0386	0.844
2	-0.432	-0.433	12.189	0.002
3	0.117	0.112	13.091	0.004
4	0.172	-0.015	15.083	0.005
5	-0.025	0.088	15.127	0.010
6	-0.013	0.052	15.139	0.019
7	-0.015	-0.016	15.155	0.034
8	0.059	0.086	15.406	0.052
9	-0.021	-0.069	15.440	0.080
10	-0.067	-0.015	15.778	0.106
11	-0.014	-0.074	15.793	0.149
12	-0.008	-0.058	15.797	0.201
13	0.011	0.001	15.806	0.260
14	-0.010	-0.035	15.815	0.325
15	-0.032	0.004	15.902	0.389
16	-0.009	-0.024	15.908	0.459
17	-0.013	-0.022	15.922	0.529
18	-0.017	-0.018	15.947	0.596
19	-0.010	-0.031	15.955	0.660
20	-0.013	-0.019	15.970	0.718
21	-0.013	-0.034	15.987	0.770
22	0.006	-0.000	15.991	0.816
23	-0.028	-0.046	16.072	0.852

Fig. 2: Retro correlations and partial correlations of the exchange rate at the first difference

Correlogram of X3

	AC	PAC	Q-Stat	Prob
1	0.575	0.575	21.479	0.000
2	0.209	-0.182	24.357	0.000
3	-0.059	-0.148	24.589	0.000
4	-0.350	-0.331	32.962	0.000
5	-0.509	-0.228	50.994	0.000
6	-0.513	-0.193	69.660	0.000
7	-0.473	-0.288	85.813	0.000
8	-0.320	-0.232	93.359	0.000
9	0.017	0.023	93.381	0.000
10	0.229	-0.144	97.369	0.000
11	0.504	0.246	117.12	0.000
12	0.692	0.302	155.16	0.000
13	0.419	-0.222	169.40	0.000
14	0.146	0.003	171.16	0.000
15	-0.095	-0.069	171.92	0.000
16	-0.318	0.005	180.65	0.000
17	-0.415	0.087	195.86	0.000
18	-0.402	-0.026	210.45	0.000
19	-0.364	0.018	222.64	0.000
20	-0.216	-0.023	227.03	0.000
21	0.060	-0.016	227.39	0.000
22	0.205	-0.065	231.56	0.000
23	0.407	0.006	248.39	0.000
24	0.550	0.166	279.97	0.000
25	0.308	-0.131	290.16	0.000
26	0.075	-0.011	290.79	0.000
27	-0.118	-0.017	292.35	0.000
28	-0.278	-0.012	301.36	0.000

Fig. 5: Retroactive and Partial Commitments of EU Agricultural Exports at Zero Level

Correlogram of X2

	AC	PAC	Q-Stat	Prob
1	0.694	0.694	31.368	0.000
2	0.393	-0.172	41.579	0.000
3	0.126	-0.148	42.639	0.000
4	-0.082	-0.118	43.104	0.000
5	-0.269	-0.195	48.136	0.000
6	-0.385	-0.126	58.637	0.000
7	-0.338	0.088	66.897	0.000
8	-0.200	0.074	69.845	0.000
9	-0.037	0.059	69.946	0.000
10	0.192	0.234	72.763	0.000
11	0.398	0.173	85.080	0.000
12	0.504	0.090	105.25	0.000
13	0.356	-0.257	115.51	0.000
14	0.160	-0.090	117.61	0.000
15	-0.020	-0.033	117.65	0.000
16	-0.185	-0.036	120.60	0.000
17	-0.343	-0.059	130.96	0.000
18	-0.421	-0.019	146.94	0.000
19	-0.385	-0.039	160.62	0.000
20	-0.271	-0.038	167.54	0.000
21	-0.136	-0.064	169.33	0.000
22	-0.008	-0.161	169.34	0.000
23	0.213	0.200	173.94	0.000
24	0.278	-0.095	182.04	0.000
25	0.175	-0.128	185.34	0.000
26	0.016	-0.093	185.37	0.000
27	-0.123	-0.066	187.09	0.000
28	-0.200	0.062	191.77	0.000

Fig. 3: Retroactive and Partial Commitments for Agricultural Imports from the EU Bloc at Zero

Correlogram of D(X3)

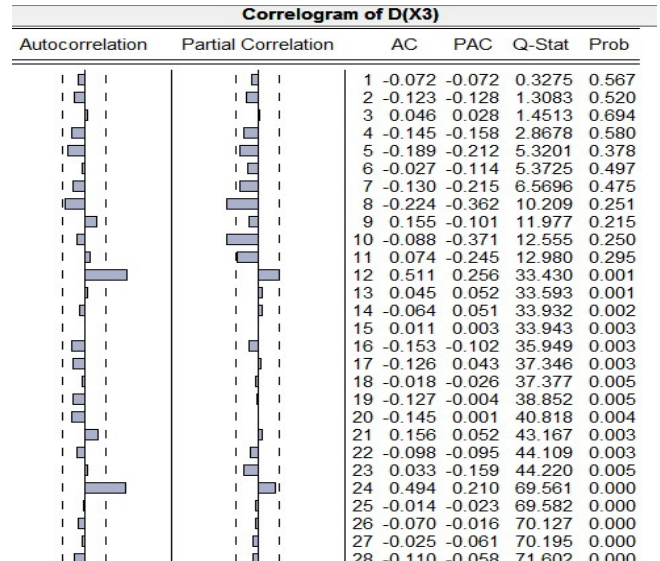|	AC	PAC	Q-Stat	Prob
1	-0.072	-0.072	0.3275	0.567
2	-0.123	-0.128	1.3083	0.520
3	0.046	0.028	1.4513	0.694
4	-0.145	-0.158	2.8678	0.580
5	-0.189	-0.212	5.3201	0.378
6	-0.027	-0.114	5.3725	0.497
7	-0.130	-0.215	6.5696	0.475
8	-0.224	-0.362	10.209	0.251
9	0.155	-0.101	11.977	0.215
10	-0.088	-0.371	12.555	0.250
11	0.074	-0.245	12.980	0.295
12	0.511	0.256	33.430	0.001
13	0.045	0.052	33.593	0.001
14	-0.064	0.051	33.932	0.002
15	0.011	0.003	33.943	0.003
16	-0.153	-0.102	35.949	0.003
17	-0.126	0.043	37.346	0.003
18	-0.018	-0.026	37.377	0.005
19	-0.127	-0.004	38.852	0.005
20	-0.145	0.001	40.818	0.004
21	0.156	0.052	43.167	0.003
22	-0.098	-0.095	44.109	0.003
23	0.033	-0.159	44.220	0.005
24	0.494	0.210	69.561	0.000
25	-0.014	-0.023	69.582	0.000
26	-0.070	-0.016	70.127	0.000
27	-0.025	-0.061	70.195	0.000
28	-0.110	-0.058	71.602	0.000

Fig. 6 : Retroactive Commitments and Partial Commitments of EU Agricultural Exports at the First Difference
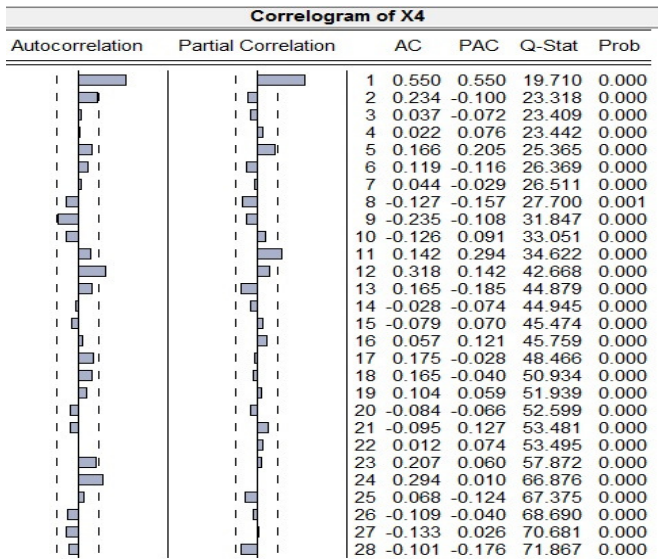
Fig. 7: Retroactive and Partial Commitments for Agricultural Imports from the League of Arab States at Zero Level
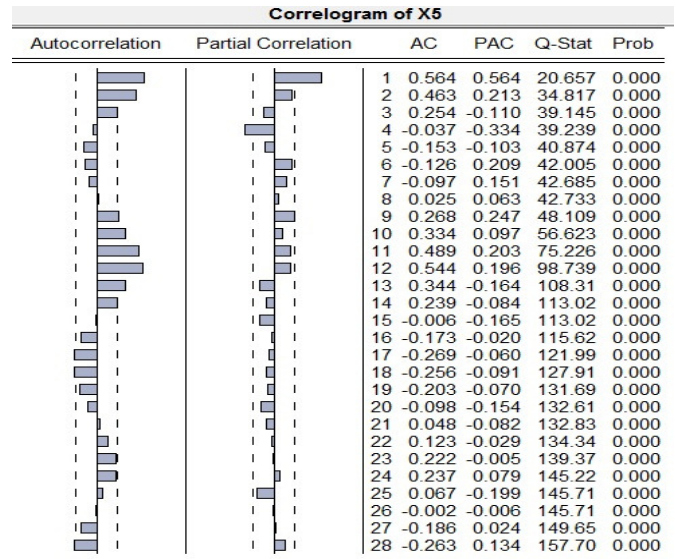

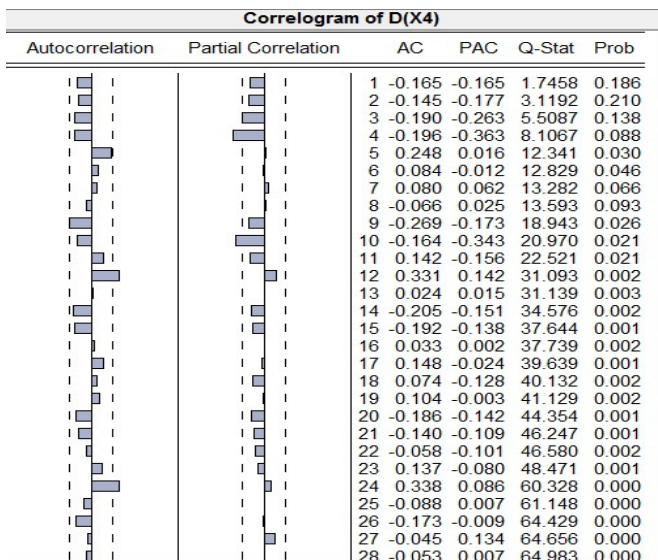**Fig. 9 :** Retroactive and Partial Commitments of Agricultural Exports of the Arab League at Zero Level

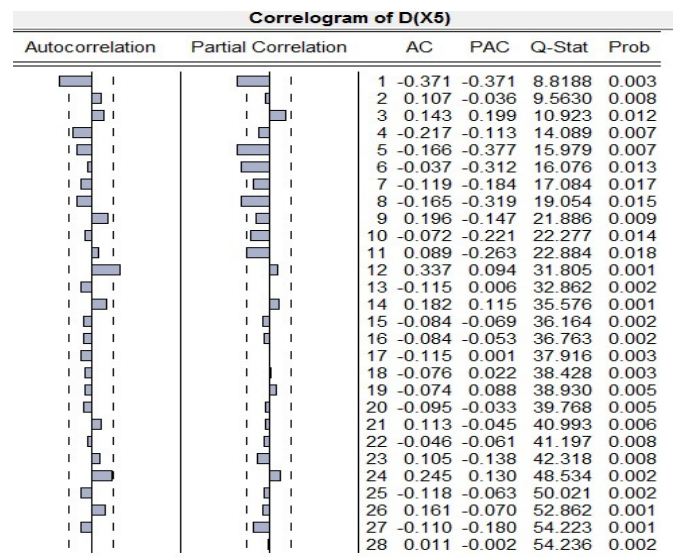**Fig. 8 :** Retroactive and Partial Correlations of Agricultural Imports from the League of Arab States at the First Difference

Fig. 10 : Retroactive and Partial Commitments of Arab League Agricultural Exports at First Difference

In order to estimate the causal relationship between agricultural imports or exports of the EU or the Arab League bloc and the exchange rate of the pound against the dollar individually through the Granger causality, it is necessary to have stable conditions of time series, which are of the same degree, and to study the stability of the time series must to do Unit Root Test first to judge the stability of the time series for all variables during the study period (April 2014-May 2019), It was also based on the Augmented Dickey Fuller test, The results of the (Dicky Fuller Extended) (ADF) test for both EU and Arab League agricultural and import chains and the exchange rate of the pound against the dollar showed that the calculated value of t is greater than its tabular value

at the level of 0.05, which means no root. Unit in Time Series - Tables (2, 3, 4).

These results are consistent with the standard theory which assumes that most macroeconomic variables are not static at zero But it becomes static when the first difference is made on the root of the unit, and then the results of the stability study indicate that there is a long-term relationship between the basic variables in making sure that all variables have the same degree of integration, so will be the least squares (OLS) method, addition, the equilibrium relationship means that none of the variables can move independently of the other, leading to integration tests that test a relationship. Long-term equilibrium between the basic variables or not,

Table 5: Augmented Dickey Fuller (ADF) Test Results

Variable	The value of (t) at the first difference
The exchange rate of the dollar against the Egyptian pound	-8.515[**]
The value of agricultural imports from the EU bloc	-7.698[**]
The value of agricultural exports of the EU bloc	-10.481[**]
The value of agricultural imports from the Arab League	-7.094[**]
The value of agricultural exports to the Arab League	-6.818[**]
The value (t) at a probability level of 0.05	-3.546[**]

*** Significant at a probability level of 0.05   Source: Compiled and calculated from: Data table (3, 4) of the study using E-views 6.

2. Granger causality test:

The direction of the causal relationship between the exchange rate variable and the agricultural imports or exports of the EU bloc and the Arab League was carried out using the Granger causality test method to determine which one affects the other, one of the conditions of causality testing is that the variables are stable in the same degree and is a condition that has been met. The causal relationship test assumes that the variables are complementary of the same degree and therefore there is a causal relationship between the two variables Where N0 Hull hypothesis is rejected and Alternative Hypothesis H1 is accepted if the calculated F value is greater than the tabular F value, we reject the Null Hypothesis and accept the alternative hypothesis, ie, there are causal relationships between the variables The results of Table (6) show that the calculated value of F is smaller than the tabular value of F and the probability degree is greater than 0.05, thus we accept the null hypothesis H0 and reject the alternative hypothesis H1 because there is no causal relationship in both directions, ie the exchange rate affects the agricultural imports and exports of the EU bloc. And the League of Arab States.

3- Estimation of the models of the exchange rate relationship with agricultural imports or exports for the bloc of the European Union and the League of Arab States during the period (April 2014-May 2019):-

A- Statistical Interpretation of the Results of the Estimated Model of Agricultural Imports from the EU bloc

The results of the estimation of the model of the impact of the exchange rate on the agricultural imports of the EU bloc in the least-squares manner during the period (April 2014-May 2019) showed that the correlation coefficient was about 0.72, indicating an inverse relationship between the independent variable (exchange rate) and the dependent variable agriculture imports to the European Union (EU).

Determination coefficient was 0.518, which means that the estimated model variables account for about 51.8% of the exchange rate fluctuations, while the rest of the fluctuations are due to other factors not included in the model. The spreadsheet is at a significance level of 0.05, hence the significance of the estimated model is shown as a whole, meaning statistically accepted model.

Table 6: Granger Causality Test between the dollar exchange rate and agricultural imports and exports of the EU bloc and the Arab League during the period (April 2014-May 2019)

Null Hypothesis	F	Prob.
The exchange rate does not cause the EU's agricultural imports	0.22	0.80
Agricultural imports of the EU bloc do not cause the exchange rate	2.48	0.09
The exchange rate does not cause agricultural exports to the EU bloc	0.39	0.68
Agricultural exports of the EU bloc do not cause exchange rate	0.44	0.65
The exchange rate does not cause agricultural imports of the Arab League	2.88	0.06
Agricultural imports of the Arab League do not cause the exchange rate	1.81	0.17
The exchange rate does not cause agricultural exports to the Arab League	1.12	0.33
Agricultural exports to the Arab League do not cause exchange rate	2.20	0.08

Source: Compiled and calculated from: Data table (3,4) of the study using E-views 6.

The rate of exchange rate change indicates that if the exchange rate of the pound against the US dollar increases by 1%, it will lead to a decline in agricultural imports of the EU bloc by about 0.4%. This is in line with the economic theory, explaining that when the exchange rate increases, the value of the Egyptian pound decreases, which leads to lower costs of domestic production elements for the outside world, and lower domestic prices compared to prices. As a result, foreigners have ceded some of their currencies to obtain one unit of the local currency, which will make the prices of agricultural imports relatively cheap, thus increasing agricultural exports and declining agricultural imports (Table 7).

Table 7 : Standard Estimation of Exchange Rate Impact Models on Agricultural Imports or Exports of the EU-Arab League Bloc during the Period (April 2014-May (2019) (Value: US $ Million)

Change	Function
The value of agricultural imports from the EU bloc	$\log\hat{Y}_1 = 0,007 - 0.361 \log X - 0.509\, AR_{(1)} - 0.467 MA_{(2)} - 0.953\, SAR_{(6)} + 0.902 SMA_{(6)}$ $(0.46) \quad (-1.03) \quad (-3.56)** \quad (-3.22)** \quad (-24.2)** \quad (21.1)**$ $R^2 = 0.518 \qquad F = 10.3^* \qquad D.W^+ = 2.0$
The value of agricultural exports of the EU bloc	$\log\hat{Y}_2 = 0.041 + 0.176 \log X + 0.655 AR_{(2)} - 0.879\, MA_{(2)} + 0.742\, SAR_{(6)} - 0.885\, SMA_{(6)}$ $(0.66) \quad (0.28) \quad (5.12)** \quad (-7.49)** \quad (9.30)** \quad (-13.1)**$ $R^2 = 0.351 \qquad F = 5.1^* \qquad D.W^+ = 1.5$
The value of agricultural imports from the Arab League	$\log\hat{Y}_3 = 0.018 - 0.267 \log X + 0.402\, AR_{(1)} - 0,948\, MA_{(1)} + 0.439 SAR_{(4)} - 0.787\, SMA_{(4)}$ $(2.26)* \quad (-0.90) \quad (3.04)** \quad (-24.9)** \quad (2.90)** \quad (-6.87)**$ $R^2 = 0.39 \qquad F = 6.4^* \qquad D.W^+ = 1.9$
The value of agricultural exports to the Arab League	$\log\hat{Y}_4 = 0.008 + 0.076 \log X + 0.279\, AR_{(1)} - 0.958\, MA_{(2)} - o.890\, SAR_{(1)} + 0.557 SMA_{(2)}$ $(1.55) \quad (0.39) \quad (1.96)* \quad (-38.5)** \quad (-12.9)** \quad (4.65)**$ $R^2 = 0.38 \qquad F = 6.5^* \qquad D.W^+ = 1.8$

AR: Auto Regressive   MA: Moving Average   SAR: Seasonality Auto Regressive
SMA: Seasonality Moving Average   *Significant at a probability level of 0.01.   ** Significant at a probability level of 0.05.
+The results of Durban Watson (DW) of agricultural import and export models of the EU or Arab League bloc estimated that the minimum non-self-correlation dL = 1.407, and the maximum non-self-correlation dU = 1.467
Thus, the value of D.W is limited to (0-4), and it follows from this that there is no subjective correlation between errors for all estimated models because the value of Durban Watson is greater than the upper limit dU and smaller than the upper limit 4- dU.
Source: Compiled and calculated from tables of numbers (3,4) searched

B. Statistical Interpretation of the Results of the Estimated Model of Agricultural Exports of the European Union:-

The results of the estimation of the model of the exchange rate effect on the agricultural exports of the EU bloc in a way that minimized the least squares during the period (April 2014-May 2019) showed that the correlation coefficient was about 0.592, which indicates a direct correlation between the independent variable (exchange rate) and the dependent variable (exports). This means that the estimated model variables account for about 35.1% of exchange rate fluctuations, while the rest of the fluctuations are due to other factors not included in the model, also explain that The calculated value of F was found to be about 5.1, which is greater than the tabular value at the level of significance of 0.05, there for Thus, significance of the estimated model as a whole is shown. This means that the model is accepted statistically - (Table 7).

The rate of exchange rate change indicates that if the exchange rate of the pound against the US dollar increases by 1%, this will lead to an increase in the agricultural exports of the EU bloc by about 0.2%, as the direct relationship between the agricultural exports of the bloc and the exchange rate indicates that the increase in the exchange rate Leading to increased agricultural exports of the EU bloc and this is in line with economic theory, The explanation is that when the exchange rate goes down the value of the Egyptian pound, which leads to a decrease in local production elements of the costs for the outside world, and the decline in domestic prices compared to world prices, so agricultural export prices are relatively cheap, leading to increased agricultural exports and declining agricultural imports.

C. Statistical Interpretation of the Results of the Estimated Model of Agricultural Imports from the League of Arab States

The results of the estimation of the model of the impact of the exchange rate on the agricultural imports of the Arab League in a way that minimized the least squares during the period (April 2014-May 2019) showed that the correlation coefficient was about 0.625, indicating an inverse relationship between the independent variable (exchange rate) and the dependent variable agricultural imports sector of the Arab League), with a coefficient of determination of 0.39. This means that the estimated model variables account for about 39% of the changes in the exchange rate, while the rest of the changes are due to other factors not included in the model, also calculated value of F is about 6.4, which is greater than the tabular value at the level of significance of 0.05 there for the significance of the estimated model is accepted statistically.

The rate of change in the exchange rate indicates that if the exchange rate of the pound against the US dollar increases by 1%, it will lead to a decrease in the agricultural imports of the Arab League by about 0.3%, as the inverse relationship between the agricultural imports of the Arab League and the exchange rate indicates that an increase in the exchange rate leads to This is in line with the economic theory - Table (7).

D. Statistical Interpretation of the Results of the Estimated Model of Agricultural Exports of the League of Arab States:

The results of estimating the model of the exchange rate effect on the agricultural exports of the League of Arab States to minimize the least-squares manner during the period (April 2014-May 2019) showed that the correlation coefficient was about 0.617, indicating a direct correlation between the independent variable (exchange rate) and the dependent variable agricultural exports Society of the Arab League, The determination coefficient was 0.38, which means that the estimated model variables account for about 38% of the changes in the exchange rate, while the rest of the changes are due to other factors not included in the model, the calculated value of F is about 6.5, which is greater than the tabular value at the level of significance 0.05, and then shows the significance of the estimated model as a whole, which means acceptance of the model statistically.

The rate of change in the exchange rate indicates that if the exchange rate of the pound against the US dollar increases by 1%, this would lead to an increase in the agricultural exports of the Arab League by about 0.1%. This leads to an increase in agricultural exports to the League of Arab States in line with the economic theory - Table (7)

Simultaneous integration test:

After confirming that the variables are integrated in the same degree and the existence of a causal relationship between the two variables of the relationship and the first condition of co-integration is achieved, and after estimating the relationship between the variables in the long run using the least squares method (OLS), The If the residue series was stable from zero, there is a common integral relationship between the variables but if the residue series is not stable from zero, there is no common integral relationship between the variables, it was found from the results of the Dickie Fuller test (ADF) - Table (8) stabilization of chains of remaining models estimated at zero grade for agricultural imports and exports of the bloc of the European Union and the League of Arab States. It was found that the calculated values are greater than the tabular values at the level of significance 0.05, and therefore reject the null hypothesis, ie, the absence of the root of the unit, and accept the alternative hypothesis, i.e., that the series of residues is stable at zero degree, and thus there is a common integration relationship between the exchange rate and agricultural imports and exports of the Union bloc European Union and the League of Arab States - Table 8.

Table 8 : Results of the Augmented Dickey Fuller (ADF) Test for the Remaining Models of Agricultural Imports and Exports of the EU and Arab League bloc during the period (April 2014-May 2019)

Change	Value (t) at zero level
The model of agricultural imports from the EU bloc-	7.112[**]
Remaining agricultural export model for the EU bloc	-5,930[**]
The model of agricultural imports from the Arab League -7.078	-7.078[**]
The agricultural export model of the Arab League -7.327	-7.327[**]
Value (t) at 0,05	-3.546[**]

**Significant at level 0.01, * Significant at level 0.05
Source: Compiled and calculated from: Table (7) data using E-views 6 program

5- Test the normal distribution of the remaining models:-

Table (9) shows that the rest of the estimation is distributed naturally considering that Jarque- Bera statistic is less than the table value of the Kai distribution where it equals 79.1 with 60 degrees of freedom at a significant level of 0.05, and the critical probability ratio is greater than the significance ratio 0.05, accept the zero assumption explain that H0 that the residuals are normally distributed, in addition to the negative torsion coefficient where the value is confined between [-3, 3], so the probability distribution of the residual models of the estimated models is moderate, indicating the similarity and symmetry of the probability distribution of the estimated models residues where the probability distribution curve of the estimated models Quirky to the left slightly.

Table 9 : Histogram Test Residual Results (April 2014-May 2019)

Change	Garcopera statistics	Critical probability ratio	Convolution coefficient
The model of agricultural imports from the EU bloc	1.772	0.412	-0.360
Remaining agricultural export model for the EU bloc	1.422	0.491	-0.401
The model of agricultural imports from the Arab League	1.821	0.402	-0.403
The agricultural export model of the Arab League	0.339	0.844	-0.143
Table value of Kai X2 distribution at 0.0560 degrees of freedom	79.1		

Significant at a probability level of 0.01. * Significant at a probability level of 0.05.**

Source: Compiled and calculated from: Table (7) data using E-views

6- Tests for the independence of errors and the homogeneity of variance for the remaining models:-

The residual test coefficients and partial correlation coefficients for these residues are within a 95% confidence interval, which means that the self-correlation between the limits of the random limit is not significant. Stability of chains with appreciation of the estimated models, and the assumption of the error independence of the estimated models of agricultural imports and exports of both the EU bloc and the Arab League. It was found that the simple self-correlation coefficients of squared squared chains of estimated models are zero at a significant level of 0.05, meaning that they fall within the 95% confidence interval. The European Union and the League of Arab States during the study period.

Third :The Impact of Exchange Rate Liberalization on Imports and Exports of the European Union and the League of Arab States during April 2014-May 2019:

The average exchange rate of the pound against the dollar during the average period before the exchange rate liberalization (April 2014-October 2016) was about 7.805 EGP / USD, while during the second period after the exchange rate liberalization (November 2016-May 2019) was about The exchange rate increased by 9.873 pounds / dollar by an increase of about 126.5% over the average period before the exchange rate liberalization (Table 10).

The value of agricultural imports from the bloc of the European Union lost during the first period (April 2014-October 2016) about 75.21 million dollars, while the average for the second period (November 2016-May 2019) about 59.56 million dollars, which decreased by about 15.66 million A decline of about 20.8% from the average of the first period before the exchange rate liberalization. The value of agricultural exports from the EU bloc during the first period (April 2014-October 2016) amounted to about 62.74 million dollars, while the average for the second period (November 2016-May 2019) was about 72.27 million dollars, which increased by 9.54 million dollars. Table (10) represents an increase of about 15.2% over the average period before the exchange rate liberalization

The value of agricultural imports from the Arab League lost during the first period (April 2014-October 2016) about $ 15.24 million, while during the second period (November 2016-May 2019) about $ 18.38 million, which increased by about 4.13 million US dollar increased by about 29% over the average period before the first exchange rate liberalization. The value of agricultural exports from the Arab League during the first period (April 2014-October 2016) amounted to about $ 105.43 million, while during the second period (November 2016-May 2019) amounted to about $ 85.73 million, which decreased by about 19.7 million. Table 10 represents a decrease of about 18.7% from the average period before the exchange rate liberalization

Table 10 : The impact of the change in the exchange rate on the value of agricultural imports and exports of the European Union and the League of Arab States during the period (April 2014-May 2019)

the change	Average of the first period (April 2014 - October 2016)	Average of the second period (November 2016-May 2019)	Measure the impact of change
Exchange Rate (EGP / USD)	7.805	17.678	126.5
Value of agricultural imports from the EU (US $ million)	75.21	59.56	-20.8
Value of EU agricultural exports (US $ million)	62.74	72.27	15.2
The value of agricultural imports from the Arab League (million dollars)	14.25	18.38	29.0
The value of agricultural exports of the Arab League (million dollars)	105.43	85.73	-18.7

Source: Compiled and calculated from Table 7 data.

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