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A Standard Model for the Impact of Policies on Foreign Trade of Frozen Vegetables, Juices and Syrups

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ABSTRACT

Research problem is The development of Egyptian exports comes at the forefront of the priorities of Egyptian decision-makers in general and the development of agricultural exports in particular, which faces many problems and obstacles that stand in the way of increasing its export capacity, some of which are related to competitiveness in foreign markets, capacity and export prices, and our Egyptian exports of frozen vegetables, juices and syrups are affected with that. The results of the research revealed that to show the impact of policies on the exports and imports of frozen vegetables, juices and sherbets for the two periods (1990-2004) (2005-2020) that there is a real effect for the two periods on the exported quantity of frozen vegetables, juices and syrups, their value and the value of the trade balance for them. The statistical significance of the quantity of imports was not confirmed. And its value for frozen vegetables, juices and syrups, where the calculated (F) was less than the tabular value. Using dummy variables, the statistically significant increase was confirmed for the two periods, as the value of the increase in the Egyptian trade balance amounted to about 4.2%, 6.2% of their average value of the trade balance of Egyptian frozen vegetables by about 14.2, 60.1 thousand dollars, respectively, while the increase in the trade balance for juices and drinks for the two periods amounted to 6.3%, 8.3% From the average of the two periods of about 4.3, 53.9 thousand dollars. The research recommends that increasing production and thus increasing Egyptian exports of frozen vegetables, juices and sherbet is the only way to improve the Egyptian agricultural trade balance for the two commodities, and that this is the only way to increase all manufactured agricultural products that increase the added value of these products.

Keywords: A standard model, policies, Dummy Variables Method

1. Introduction

Foreign trade is one of the basic elements of economic development and the imbalance of trade relations between the countries of the world, which results in a continuous deficit in the balance of payments, which leads to an imbalance in the economic structure of these countries. Internationally, in light of the competition between the exporting countries within the global markets and the doubts about it, getting to know the conditions of each of the markets and competitors and the price levels leads to an increase in the quantity of exports to those markets and consequently the state's proceeds from the foreign currency, and consequently the increase in the national income.

Therefore, the state has taken care of diversifying and encouraging Egyptian exports in the light of its knowledge, and agricultural exports in particular. Among the most important Egyptian agricultural exports are vegetables in general, frozen vegetables, juices and syrups, as they add an added value by manufacturing and encouraging and developing these exports. Several challenges may lead to a decrease in the quantity of some exports in order to increase the intensity of competition between countries to obtain the largest share in the global market.

The value of agricultural exports during the recent period amounted to about $2.3 billion, equivalent to 7.5% of the total value of Egyptian exports, and for the state's interest in increasing locally

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manufactured exports, it became clear that exports of frozen vegetables increased, reaching about 58 thousand tons, estimated at about 87 thousand dollars, while imports amounted to about 3.8 thousand tons, worth 5.6 thousand dollars, and this is reflected in the trade balance, as it amounts to 82 thousand dollars in favor of Egypt, while the amount of exports of juices and syrups is about 139 thousand tons, with a value of about 130 thousand dollars, while the amount of imports is estimated at about 59 thousand tons, with a value of 70 thousand dollars And the trade balance in favor of Egypt during the period (2016-2020)

The problem of the study

Research problem is The development of Egyptian exports comes at the forefront of the priorities of Egyptian decision-makers in general and the development of agricultural exports in particular, which faces many problems and obstacles that stand in the way of increasing its export capacity, some of which are related to competitiveness in foreign markets, capacity and export prices, and our Egyptian exports of frozen vegetables, juices and syrups are affected with that.

Objective of the Study

The research aims to demonstrate the impact of Egyptian agricultural policies on the export of frozen vegetables, juices and syrups by dividing the study period into two periods, the first (1990-2004), a period in which partial economic liberalization took place, and the second (2005-2020), a period of complete liberalization of the economy and leaving the market to the forces of supply and demand This is to show whether there is a clear agricultural strategy to increase the amount of exports of frozen vegetables and juices by raising the efficiency of the performance of foreign agricultural trade.

Data Sources and Research Method

The data was obtained from the Central Agency for Public Mobilization and Statistics, the annual bulletin to develop the movement of the production and available consumption is the most important industrial commodities. As for the research method, it was based on chow's model to find out the difference between the first (1990-2004) and the second (2005-2020) study period and also used dummy variable.

Test Model (F-Chow)

Model Description

The f-chow test is preformed to compare two periods to find out whether there's a real difference between periods or not. Another method may be used, which is dummy variables, and it's used to determine whether there are differences between periods or not, meaning that the difference is due to the intersection parameter, the regression parameter, or both together, the chow test is crystallized in estimating the sum of squares of deviations due to the residual (error) (SSE), and through which the F-Chow can be estimated, by performing the following steps:

1- The general trend line is estimated and then the regression coefficients for the first stage can be estimated from the outputs of (SSE1), and similarly (SSE2) for the second stage.
2- The general trend line is estimated in the two stages combined, considering that they are one stage, and from the model outputs, (SSET) can be estimated.
3- (SSE1) and (SSE2) are collected and their sum expresses in SSEU.
4- The difference between the two estimates SEET and SSEU is calculated as follows: D=SSET– SSEU.
5-The value of (F) calculated according to the Chow test is calculated as follows: D/K__ F Chow =SSEU / (N-2K) where K = number of study variables, N = number of years.
6- The calculated (F) according to the Chow test is compared with its theoretical value from (F) tables at any level of significance with degrees of freedom [(k, (N-2K)]. The results are interpreted according to the standard (F) test.

Dummy Variables Method

To identify the source of the difference using dummy variables, the used model can be described as follow:

YT
=a+b1T+b2D+b3TD……...……..(1)

Where YT = dependent variable = independent variable (time) D = transitional variable by taking the value (0) for the first period and the value (1) for the second period

TD =D* T……..(2)

From this equation, the equation representing the first period can be derived as follows:

Yt1=a+b1T……...….(3)

And the equation representing the second period may also be derived as follows:

Yt2= (a=b2) + (b1+b3) T or Yt2=a+BT……...….(4)

By dividing the study period into two periods, the first (1990-2004) and the second (2005-2020) to know the impact of policies on the Egyptian agricultural trade balance for frozen vegetables, juices and syrups. Table No. (1) shows that the second period (2005-2020) increases the average amount of exports of frozen vegetables by about 33.2 thousand tons, representing about 173% of the average for the first period (1990-2004) While the value of exports of Egyptian frozen vegetables increased by 48 thousand dollars, representing about 334 percent of the first period. In contrast, the average amount of imports for the second period increased by about 1.69 thousand tons, representing about 391% of the first period, and the value of imports was about 2.5 thousand dollars, representing about 770% of the first This is reflected in the Egyptian agricultural trade balance for frozen vegetables, with an increase of about $46,000, representing 324 percent of the value for the first period.

While Table No. (1) shows the increase in the amount of Egyptian exports of juices and drinks for the second period (2005-2020) by about 81 thousand tons, representing about 1078% over the first period (1990-2004), and the value of the increase is about 77 thousand dollars, representing about 1440%. The amount of imports of Egyptian juices and sherbets will increase for the second period by about 28 thousand tons, representing about 2263% of the first, with a value of about 27 thousand dollars, representing about 2594 percent of the first, and this is reflected in the trade balance of juices and syrups in favor of Egypt, where the value of the increase is 50 thousand dollars, representing about 1159 % for the first period

Table 1: Quantity of exports and value of exports frozen vegetables and Juices and drinks

Statement	Quantity of exports (thousand tons)	value of exports (thousand dollars)	quantity of imports (thousand tons	value of imports (thousand dollars)	trade balance (thousand dollars)
Frozen vegetables					
First period (1990-2004)	19.24	14.58	0.43	0.32	14.19
Second period (2005-2020)	52.46	62.97	2.12	2.883	60.142
The difference between the two periods	33.2	48.42	1.68	2.503	45.94
% Increase between the two periods	172.68	333.7	390.9	770.52	323.71
Juices and drinks					
First period (1990-2004)	7.46	5.33	1.24	1.04	4.28
Second period (2005-2020)	87.9	82.1	29.48	28.1	53.98
The difference between the two periods	80.50	76.72	28.2	27.08	49.7
% Increase between the two periods	1077.79	1440.2	2263.	2593.87	1159.27

The chow model and the dummy variables model were used to obtain the value of (F) for the two periods that were divided, the first period (1990-2004, It's a period of partial liberalization of Egyptian agricultural policies, and the second period (2005-2020), the period of complete liberation of

agricultural policies to determine the extent these policies are applied to the Production and trade of frozen vegetables, juices and syrups.

By dividing the study period into two periods, the first (1990-2004) and the second (2005-2020) to know the impact of policies on the Egyptian agricultural trade balance for frozen vegetables, juices and syrups. Table No. (1) shows that the second period (2005-2020) increases the average amount of exports of frozen vegetables by about 33.2 thousand tons, representing about 173% of the average of the first period (1990-2004), while the value of exports of Egyptian frozen vegetables increased by 48 thousand dollars, representing about 334% over the first period. In contrast, the average quantity of imports for the second period increased by about 1.69 thousand tons, representing about 391 percent for the first period, and the value of imports was about 2.5 thousand dollars, representing about 770% of the first, and this is reflected in the Egyptian agricultural trade balance for frozen vegetables, so the increase amounted to about 46 thousand dollars, representing about 324% of the value for the first period.

While Table No. (1) shows the increase in the amount of Egyptian exports of juices and drinks for the second period (2005-2020) by about 81 thousand tons, representing about 1078% over the first period (1990-2004), and the value of the increase is about 77 thousand dollars, representing about 1440%. The amount of imports of Egyptian juices and sherbets will increase for the second period by about 28 thousand tons, representing about 2263% of the first, with a value of about 27 thousand dollars, representing about 2594 percent of the first, and this is reflected in the trade balance of juices and syrups in favor of Egypt, where the value of the increase is 50 thousand dollars, representing about 1159 % for the first period.

Table 2: Quantity, value and trade balance of frozen vegetables, juices and sherbet exports for the two periods (1990-2004) (2005-2020).

Statement	Quantity of exports (thousand tons)	value of exports (thousand dollars	quantity of imports (thousand tons)	value of imports (thousand dollars)	trade balance (thousand dollars)
sseu1	267.8957	42.43214	4.605971	3.693806	21.08709
sseu2	32457.04	35849.28	8771.167	10361.74	7664.379
SUM	32724.94	35891.71	8775.773	10365.43	7685.466
sset	70857.8	66210.08	10699.71	10730.82	23630.93
d	38132.86	30318.37	1923.941	365.3851	15945.46
d/k	19066.43	15159.19	961.9704	182.6925	7972.732
n-2k	27	27	27	27	27
sseu/n-2k	1212.035	1329.323	325.0286	383.9049	284.6469
f	15.73092	11.40369	2.959648	0.47588	28.0092
Statistical Significance	Significance	Significance	No significance	No significance	Significance

Source:
*Central Agency for Public Mobilization and Statistics, Foreign Trade Bulletin, miscellaneous issues.
*International Trade Data Website www.trademap.org .

It was found from the previous results of the model (F-chow) that there is a real difference between the two periods (1990-2004) (2005-2020) for of the quantity of exports and value of exports and quantity of imports andvalue of import trade balance frozen vegetables, the dummy variables were used in which the value (0) for the first period and the value (1) for the second period were placed and the dependent variable is (Y) which is the value of each of the quantity of exports and value of exports and quantity of imports andvalue of import trade balance The independent variables are time (X), which is 31 years, then the dummy variable (d), which is (0) (1) and then multiplies the time by the dummy variable so that the resulting value is (dX) , thus, the equations in Table (3) are obtained.

Table No. (2) shows that the rate of increase in the exported quantity of Egyptian frozen vegetables for the first period (1990-2004) is about 1.02 thousand tons, representing about 6.25% of the average of the first period of about 19.2 thousand tons, while the rate of increase for the exported quantity of Egyptian frozen vegetables is For the second period (2005-2020) about 0.07 thousand tons,

representing about 0.13% of the average period of about 52.5 thousand tons. Table No. () shows that the coefficient of determination is about 0.29, and the calculated value (q) is about 3.7 As for the value of Egyptian exports of frozen vegetables, the annual increase rate for the first period amounted to about 0.68 thousand dollars, representing about 4.7% of the average of the first period of about 14.5 thousand dollars, while the rate of increase amounted to about 4.2 thousand dollars for the second period, representing about 6.7% of the average of the second period The amount is about 62.6 thousand dollars, while it is clear from Table No. (2) That the coefficient of the specificity is about 0.54, and the calculated (F) value is 10, which confirms the significance of the estimated model

As for the value of Egyptian exports of frozen vegetables, the annual increase rate for the first period amounted to about 0.68 thousand dollars, representing about 4.7% of the average of the first period, which amounted to about 14.5 thousand dollars, while the rate of increase was about 4.2 thousand dollars for the second period, representing about 6.7% of the average of the second period, which amounted to about 62.6 thousand dollars, while it is clear from Table No. (4) That the coefficient of The specificity is about 0.54, and the calculated (F) value is 10, which confirms the significance of the estimated model. As for the Egyptian imports of frozen vegetables, the table shows that the rate of increase in the imported quantity of Egyptian frozen vegetables for the first period is about 0.01 thousand tons, representing about 2.27% of the average of the first period of about 44, 000 tons, while the rate of increase of the imported quantity of frozen vegetables is The Egyptian period for the second period is about 0.31 thousand tons, out of the average period of about 2.12 thousand tons, which represents about 14.6%. Table No. () shows that the coefficient of determination is about 0.62 and the calculated value of (P) is about 14.6, which confirms the significance of the estimated model

Table 3: Shows the equations for quantity of exports and value of exports and quantity of imports andvalue of imports trade balance of frozen vegetables, juices and syrups using dummy variables for the two periods (1990-2004) (2005-2020).

Statement	a	B1x	B2D	B3Dx	R^2	F
The quantity of exports from frozen vegetables (thousand tons)	9.7 (0.06)	1.2 (0.68)	13.1 (0.31)	-0.072 *(-2.4)	0.29	3.7
The value of exports frozen (thousand dollar)	9.1 (0.57)	0.68 (0.39)	-61.2 (-1.5)	4.2 (1.8)	0.54	10.4
The quantity of import from frozen vegetables (thousand tons)	0.35 (0.06)	0.01 (0.16)	-5.8 **(3.6)	0.31 **(3.4)	0.62	14
The value of imports frozen (thousand dollar)	0.24 (0.38)	0.01 (0.15)	-8.3 (5.2)**-	0.45 (4.7)**	0.91	96.3
Trade balance (thousand dollars)	8.9 (0.56)	0.67 (0.38)	-52.9. (-1.3)	3.77 (1.67)	0.50	9
The quantity of exports from quantity of juices and drinks thousand tons)	0.36 (0.05)	0.98 (1.3)	-141 (7.9)**	8.8 (8.6)**	0.95	173
The value of exports of juices and drinks (thousand dollar)	2.2 (0.29)	0.39 (0.46)	-161 (-8)**	9.9 (8.6)**	0.94	134
The quantity of import from quantity of juices and drinks thousand tons)	0.22 (0.04)	0.13 (0.19)	-90.1. (-5.9)**	4.95 (5.7)**	0.83	43
The value of import juices and drinks (thousand dollar)	0.13 (0.02)	0.11 (0.17)	-101.7 (6.2)**	5.4 (5.7)**	0.81	39.6
Trade balance (thousand dollars)	2.09 (0.17)	0.27 (0.2)	-59.7 (-1.9)	4.5 (2.4)*	0.65	17

Source:
*Central Agency for Public Mobilization and Statistics, Foreign Trade Bulletin, miscellaneous issues.
*International Trade Data Website www.trademap.org.

As for the value of Egyptian imports of frozen vegetables, the annual increase rate for the first period amounted to about 0.01 thousand dollars, representing about 3.13% of the average of the first period of about 0.32 thousand dollars, while the rate of increase amounted to about 0.54 thousand dollars for the second period, representing about 15.9% of the average of the second period and about adult. 2.83 thousand dollars, while it is clear from Table No. (3) That the coefficient of determination is about 0.91 and the calculated value of (F) is 96.3, which confirms the significance of the estimated model.

While the annual rate of increase in the value of the trade balance of frozen Egyptian frozen vegetables is estimated at about 0.62 thousand dollars, representing about 4.3% of the average of the

first period of about 14.2 thousand dollars, while the rate of increase in the trade balance of Egyptian frozen vegetables for the second period is about 3.77 thousand dollars, representing about 6.27% From the average period of the second study, which amounted to about 60.1 thousand dollars, while it is clear from Table No. () that the coefficient of determination is about 0.5, and the calculated value of F) is 9, which confirms the significance of the estimated model.

As for the Egyptian exported and imported juices and syrups, Table No. (4) shows that the rate of increase in the exported quantity of Egyptian juices and syrups for the first period (1990-2004) amounted to about 0.89 thousand tons, representing about 13% of the average of the first period of about 7.5 thousand tons, while The rate of increase of the exported quantity of Egyptian juices and syrups for the second period (2005-2020) is about 8.6 thousand tons, representing about 10% of the average period of about 87.9 thousand tons. Table No. (3) Shows that the coefficient of determination is about 0.95, and the value of (F) calculated is about 173, which confirms the significance of the estimated model

As for the value of Egyptian exports of juices and drinks, the annual increase rate for the first period amounted to about 0.39 thousand dollars, representing about 7.4% of the average of the first period, which amounted to about 5.3 thousand dollars, while the rate of increase amounted to about 9.9 thousand dollars for the second period, representing about 12% of the average of the second period The amount is about 82.4 thousand dollars, while it is clear from Table No. (3) That the coefficient of determination is about 0.94, and the calculated value of (F) is 134, which confirms the significance of the estimated model.

Table 4: The estimated annual change and the percentage of increase in the average quantity of exports and value of exports and quantity of imports andvalue of import Trade balance of frozen vegetables, juices and syrup for the two study periods.

Statement	Average period	Amount of annual increase		% Amount of annual increase from the average	
		The First period	The Second period	The first period	The Second period
The quantity of exports from frozen vegetables (thousand tons)	19.2 52.5	1.02	0.07	6.25	0.13
The value of exports frozen (thousand dollar)	14.5 62.6	0.68	4.2	4.7	6.7
The quantity of import from frozen vegetables (thousand tons)	0.44 2.12	0.01	0.31	2.27	14.6
The value of impors frozen (thousand dollar)	0.32 2.83	0.01	0.54	3.13	15.9
Trade balance (thousand dollars)	14.2 60.1	0.62	3.77	4.3	6.27
The quantity of exports from quantity of juices and drinks thousand tons)	7.5 87.9	0.98	8.6	13	10
The value of exports of juices and drinks (thousand dollar)	5.3 82.1	0.39	9.9	7.4	12
The quantity of import from quantity of juices and drinks thousand tons)	1.29 29.5	0.13	4.95	10.4	16.7
The value of import juices and drinks (thousand dollar)	1.04 28.1	0.11	5.4	10.6	19.2
Trade balance (thousand dollars)	4.3 53.9	0.27	4.5	6.3	8.3

Source:
*Central Agency for Public Mobilization and Statistics, Foreign Trade Bulletin, miscellaneous issues.
*International Trade Data Website www.trademap.org

As for the Egyptian imports of juices and sherbets, the table shows that the rate of increase in the imported quantity of Egyptian juices and syrups for the first period is about 0.13 thousand tons, representing about 10.4% of the average of the first period of about 1.29 thousand tons, while the rate of increase of the imported quantity from The Egyptian juices and syrups for the second period are about 4.95 thousand tons, representing about 16.7% of the average period of about 29.5 thousand tons.

It is clear from Table No. (2) That the coefficient of determination is about 0.83 and the calculated value of (F) is about 43, which confirms the significance of the estimated model

As for the value of Egyptian imports of juices and syrups, the annual increase rate for the first period amounted to about 0.11 thousand dollars, representing about 10.6% of the average of the first period, which amounted to about 1.04 thousand dollars, while the rate of increase amounted to about 5.4 thousand dollars for the second period, representing about 19.2% of the average of the period. The second and the adult about. 28.1 thousand dollars, while it is clear from Table No. (2) That the coefficient of determination is about 0.81 and the calculated value of (F) is 39.6, which confirms the significance of the estimated model

While the annual rate of increase in the value of the trade balance of frozen Egyptian juices and sorbets is estimated at 0.27 thousand dollars, representing about 6.3% of the average of the first period of about 4.3 thousand dollars, while the rate of increase in the trade balance for Egyptian juices and drinks for the second period is about 4.5 thousand dollars, representing about 8.3% of the average period of the second study, which amounted to about 53.9 thousand dollars, while it is clear from Table No. (3) That the coefficient of determination is about 0.65, and the value of (q) calculated is 17, which confirms the significance of the estimated model

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