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An Economic Study of the Competitiveness of Egyptian Exports of Fresh Grapes

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Abstract:
Foreign trade plays an important role in balancing the economic structure, fruit crops are one of the most important Egyptian agricultural exports, and the fresh grape crop is an important export crop. The research aims to study the competitive center for Egyptian exports of fresh grapes, in achieving its objectives, this research relied on both descriptive and quantitative statistical analysis methods, where some statistical analytical methods were used, and the research was divided into two periods, the first periods (2001-2010), the second period (2011-2020) to compare them using some indicators for each of the two periods. The results showed that the value of the geographical concentration coefficient of the quantity of Egyptian exports of grapes during the two research periods was estimated at 16.74 ، 14.1 respectively, and the gravity model includes 8 variables explaining Egypt's exports country (i) of fresh grapes to countries (j) per year (t), an increase in the population of Egypt by 1% leads to a decrease in the Egyptian exports of fresh grapes by 7.87%, this is due to, when the population of Egypt increases, the demand for the fresh grape crop increases locally.

Keywords: *market share, Geographical distribution, Instability coefficients, gravity model.*

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I. Introduction

Foreign trade plays an important role in balancing the economic structure, as well as its impact on economic development and the creation of external demand for local exports, which pushes the wheel of development towards increasing its growth rate to cover the need for domestic demand, which is reflected in the rate of economic development, and then the development of Egyptian exports is considered one of the most important challenges facing the Egyptian economy, especially in light of the current international conditions and the emergence of international economic blocs, which results in a change in the conditions of world trade exchange and reliance on standards of quality and efficiency and its superiority over standards of comparative advantage, which depends in its interpretation of international trade trends to the difference in the price of the commodity, so the need to rely on the comprehensive and dynamic competitive advantage has increased, which places a burden on the economic and agricultural policy to improve production in quantity and quality to raise competitiveness and open new world markets.

Fruit crops are one of the most important Egyptian agricultural exports, and the grape crop is an important export crop. The total and fruitful area of grapes amounted to about 190.49, 174.72 thousand feddans, represented by About 16.28% and 17.65% of the total and fruitful area of fruit in Egypt amounted to about 1169.95 and 989.69 thousand feddans respectively in(7) 2019, and the quantity of Egypt's exports of grapes amounted to about 154.21 thousand tons with a total value estimated at about 234.89 million(3) dollars, and the quantity of exports represented about 1.16% and 9.64% of the total production of fruits and grapes in Egypt, which amounted to about 13.32 and 1.60 million(7) tons, respectively, in the same year.

II. Research problem

The research problem is summarized in the decrease in the exported quantities of Egyptian grapes during the last decade from about 623.20 thousand tons in 2011 to about 103.75 thousand tons(3) in 2020, at a rate of decrease estimated by about 83.35% as a result of the exposure of Egyptian grape exports to great competition from some countries that specialized in exporting grapes in their important markets export as a result of the great ability of competing countries to meet export requirements at low export prices with the rapid progress of those countries in modern technological methods in the production and export of grapes, which threatens to lose the traditional markets for Egyptian exports of grapes and the lack of information on export

specifications and market needs, and then there is a problem research in an attempt to answer a question, is it possible to increase Egyptian grape exports, in a manner that preserves the foreign exchange needed to finance imports and advance productive development?

III. Research aims

The research aims to study the competitive center for Egyptian exports of fresh grapes, by studying the following objectives:

- Studying some competitive indicators of the grape crop.
- Geographical distribution of Egyptian exports of the research crop.
- Identifying the most important importing countries for the grape crop from Egypt.
- Determining the most important factors affecting the flow of Egyptian exports from the research crop to the world market and measuring the impact of these factors through the gravity model.

IV. Research method and data sources:

In achieving its objectives, this research relied on both descriptive and quantitative statistical analysis methods, where some statistical analytical methods were used, and the competitive ability of Egyptian grapes in the most important world markets was estimated through the use of some competitiveness measures such as the market share index, apparent comparative advantage, concentration index Geography of Jenny Hirschman, geographical distribution, price competitive position, and the coefficient of instability of the quantity of Egyptian exports of the research crop.

The trade flow and flow model (gravity model) was also estimated as a model based on a clear theoretical basis and in agreement with recent studies that seek to explain the establishment, flow and flow of trade. It also takes into account the largest possible number of variables that explain the level of trade between countries. To identify the fundamental factors affecting the Egyptian exports of the researched crop in it's most important foreign markets.

The research relied on secondary data obtained from the database of the Food and Agriculture Organization, the International Monetary Fund, the International Trade Center website, the World Bank website, and the economic affairs sector bulletins at the Ministry of Agriculture.

The research also relied on the method of panel data collected from by using the random effects model to estimate the gravity model for the flows of fresh grapes between Egypt and the countries of the world.

V. Research results

First: Indicators of measuring the competitiveness of fresh Egyptian grape exports during the research period (2001-2020):

The research relied on the study of these indicators on the most important export markets for the fresh grape crop, according to the relative importance of the quantity of Egyptian exports to those markets during the research period (2001-2020), so united kingdom, Netherlands, Germany, Italy and Russia came as the five most important markets for the quantity of Egyptian grape exports reached about 744.66 ، 436.48 ، 184.79 ، 175.52 ، 156.39 thousand tons, representing about 32.28% ، 18.92% ، 8.01% ، 7.61% ، 6.78% respectively, of the total average quantities of exported fresh Egyptian grapes for all markets during the same period, and to show that competitiveness was divided into the research for the first periods (2001-2010), the second period (2011-2020) and the calculation of those indicators for each of the two periods.

1- The market share of fresh Egyptian grapes in the most important international markets during the two research periods:

Market share is one of the most important indicators of marketing and export efficiency, and through this indicator it is possible to infer the extent of competition between a number of countries producing and exporting similar goods. Competitiveness and certain comparative advantages, and it calculated from the following equation [(9)]:

$M = (QX_{EX}/TQX_{IM})\ 100$

Where:

M: Market share of fresh Egyptian grape export markets.

QX_{EX}: Quantity of fresh Egyptian grape exports for each market.

TQX_{IM}: Total import quantity for each market of fresh Egyptian grapes.

By studying the market share of Egypt's exports of fresh grapes to the most important importing countries during the period (2001-2020), as shown in Table (1), it became clear that during the first period of the research (2001-2010), the market share of grape exports to Germany reached about 0.83, while it amounted to about 4.87% during the second period of the research (2011-2020), by comparing the two research periods, it is clear that the market share increased during the second period compared to the first, which means that Germany

obtains about 2.85% of its imports from Egyptian grapes as an average of the two research periods, as the share estimated The market share of united kingdom during the first period was about 9.64%, while it amounted to about 19.85% during the second period, which means that united kingdom gets about 14.74% of its imports from Egyptian grapes as an average for the two research periods, and the market share of Netherlands during the first period of the research amounted to about 2.39%, while the market share during the second period of the research amounted to about 4.24%, which means that Netherlands gets about 3.31% of its imports from Egyptian grapes during the two study periods.

As for Russia, the market share during the first period of the research reached about 0.78%, while it reached about 4.32% during the second period, which means that Russia gets about 2.5% of its imports from Egyptian grapes during the two research periods.

The market share of Italy during the first period was estimated at about 36.7%, while the market share during the second period of the research was about 32.1%, by comparing the two research periods, it becomes clear that the market share increased during the second period compared to the first, in addition to the high stability of exported quantities and the ability to maintain the market share. This means that Italy gets about 34.36% of its imports from Egypt as an average of the two research periods.

Table no (1): The market share of Egyptian grapes in its most important world markets during the two research periods, the first period (2001-2010), the second period (2011-2020):

Statement		The most important importing countries				
		Germany	united kingdom	Netherlands	Russia	Italy
Average of first period	Total imports of grapes for the country (tons)	331061	233122.8	439735.4	274848.4	23878.5
	Egyptian grape imports (tons)	2756.5	22466.2	10505.4	2133.1	8752.6
	Market share (%)	0.83	9.64	2.39	0.78	36.65
Average of second period	Total imports of grapes for the country (tons)	322854	262015	781567.6	319440.9	27446.3
	Egyptian grape imports (tons)	15722	51999.7	33142.5	13505.4	8799.1
	Market share (%)	4.87	19.85	4.24	4.23	32.06
Average of the two periods	Market share (%	2.85	14.74	3.31	2.50	34.36

Source: Collected and calculated:

1 - The website of the United Nations, trade map database.

2 - The International Trade Center website, International Trade Center ITC.

3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

2- Geographical concentration index of Egyptian exports of fresh grapes during the two research periods:

The export concentration index expresses the degree of dependence of a particular country's exports on a certain number of crops. The Hirschman Ginny coefficient was used in calculating the degree of geographical and commodity concentration of Egyptian exports of fresh grapes, this coefficient is estimated through the following equation [(8)]:

$C_{IX} = 100 \sqrt{\Sigma(X_{SJ} / X_i)^2}$

Where:

C_{IX}: Geographical concentration factor of the quantity of Egyptian exports of fresh grapes to the most important international markets.

X_{SJ}: Quantity of Egyptian exports of fresh grapes per market.

X_I: Total Egyptian exports of fresh grapes to the world market.

The data of Table no (2) indicates that the value of the geographical concentration coefficient of the quantity of Egyptian exports of grapes during the two research periods was estimated at 16.74 ، 14.1 respectively, and thus the geographical concentration coefficient is relatively low, which reflects the multiplicity and expansion of foreign markets for Egyptian exports of grapes.

3- The apparent comparative advantage of fresh Egyptian grape exports during the two research periods:

The apparent comparative advantage index shows the potential opportunities to expand trade, and presents approximate images of future exports, through the ratio of the country's share of world exports of a commodity to the ratio of the share of world exports of that commodity in world agricultural exports, Where the country has an apparent comparative advantage in a particular activity, if the value of the relative advantage index is greater than the correct one, Conversely, the country does not have an apparent comparative advantage

if the value of this indicator is less than correct one, and the apparent comparative advantage is calculated from the following equation [(10)]:

Table no (2): The geographical concentration factor of Egypt's exports of grapes during the two research periods, the first period (2001-2010), the second period (2011-2020):

Country	Geographical concentration factor	
	First period	Second period
Germany	4.95	8.99
united kingdom	40.33	29.72
Netherlands	18.86	18.94
Russia	3.83	7.72
Italy	15.71	5.03
Average	16.74	14.08

Source: Collected and calculated:
1 - The website of the United Nations, trade map database.
2 - The International Trade Center website, International Trade Center ITC.
3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

$RCA = (EVX_{EX}/EVA_{EX}) / (WVX_{EX}) /WVA_{EX})$
Where:
RCA: The apparent comparative advantage of grape exports.
EVX_{EX}: Value of Egyptian grape exports.
WVX_{EX}: Total value of world grape exports.
EVA_{EX}: Total value of Egyptian agricultural exports.
WVA_{EX}: Total value of world agricultural exports.
The data of Table no (3) indicates an increase in the value of the apparent comparative advantage coefficient for Egyptian grapes during the two research periods, as it was estimated at 5.83 and 7.29 respectively, which indicates the existence of an apparent comparative advantage for Egyptian grape exports in international markets, and it enjoys great acceptance by the consumer.

Table no (3): The apparent comparative advantage of Egypt's exports of fresh grapes during the two research periods, the first period (2001-2010), the second period (2011-2020):
(Thousand dollars)

Statement	Value of Egypt's exports of grapes	Value of world exports of grapes	Total value of Egypt's agricultural exports	Total value of world agricultural exports	Apparent comparative advantage of Egypt's exports of grapes
First period	70.65	4362.42	2502.44	900379.8	5.83
Second period	225.64	7862.80	6554.51	1664439.6	7.29

Source: Collected and calculated:
1 - The website of the United Nations, trade map database.
2 - The International Trade Center website, International Trade Center ITC.
3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

4- Geographical distribution of Egyptian exports of fresh grapes during the two research periods:

By studying the geographical distribution of Egyptian grape exports in the most important world markets during the first period of the research (2001-2010) as shown in Table no (4), it was found that the average total quantity of Egyptian grape exports amounted to about 55.7 thousand tons, and the United Kingdom ranked first, as It acquired an estimated 22.5 thousand tons, representing about 40.3% of the average total quantity of Egyptian grape exports, valued at about 28.03 million dollars, and Netherlands, Italy, Belgium, Germany, Russia, Kuwait, Sudan, UAE, Saudi Arabia South Africa and Slovenia, representing about 18.9% ، 15.7% ، 5.5% ، 4.9% ، 3.8% ، 1.4% ، 1.4% ، 1.4% ، 0.7% ، 0.6%، 0.2% respectively, of the total quantity of fresh grape exports, as an average for the first period of the research other countries contributed about 5.2% of the average quantity of exports, and about 4.8% of the average value of exports.

From the above, it is clear that the United Kingdom, Netherlands and Italy are the most important import markets for Egyptian grapes, as these countries absorbed about 74.9% of the total Egyptian exports of grapes during the first research period, and it was also found that the Egyptian export price of grapes to Slovenia achieved the highest Egyptian export prices, estimated at 2212.8 dollars/ton, while the export price of Egyptian grapes to Italy was the lowest export price for Egyptian grapes, estimated at about 1003.7 dollars/ton during the same period.

By studying the geographical distribution of Egypt's grape exports during the second period of research (2011-2020), it becomes clear that the average total quantity of Egyptian grape exports amounted to about 174.9 thousand tons, and The United Kingdom occupied the first place, as the quantity exported to it was estimated at about 52 thousand tons, representing about 29.7% of the average total quantity of grape exports, and the value of this quantity was estimated at about 68.2 million dollars, and The share of Netherlands, Germany, Russia, Sudan, Italy, Belgium, Saudi Arabia, Emirates, Slovenia, South Africa and Kuwait amounted to about 18.9% ، 9%, 7.7% ، 6.2% ، 5% ، 3.6% ، 3.6% ، 3.4% ، 2.4% ، 2.2% 1.7% respectively, of the total quantity of fresh grape exports, during the second period, while other countries contributed about 6.6% of the total average quantity of exports, and about 12.7% of the average total value of exports, and it is clear from the above that United Kingdom, Netherlands, Germany and Russia are the most important import markets for Egyptian grapes, as these countries absorbed about 65% of the total quantity of Egyptian exports of grapes during the second research period, and it was also found that the price of the Egyptian export of grapes to Slovenia achieved the highest Egyptian export prices, as it was estimated at About 1501 dollars / ton, while the export price of Egyptian grapes to Belgium is the lowest export price for Egyptian grapes, estimated at 788.9 dollars / ton during the period in question.

Table no (4): Geographical distribution of Egyptian exports of grapes during the two research periods, the first period (2001-2010), the second period (2011-2020).

Statement	First period					Second period				
	Quantity (thousand tons)	%	Values (thousand dollars)	%	price (dollars/ton)	Quantity (thousand tons)	%	Values (thousand dollars)	%	price (dollars/ton)
united kingdom	22.5	40.3	28037.3	39.8	1248	52	29.7	68187.1	30.3	1311.3
Netherlands	10.5	18.9	14811.4	21	1409.9	33.1	18.9	48734.4	21.6	1470.5
Russia	2.1	3.8	2958.4	4.2	1386.9	13.5	7.7	16576.9	7.4	1227.4
Germany	2.8	4.9	4545.1	6.5	1648.9	15.7	9	20983.2	9.3	1334.6
Slovenia	0.1	0.2	273.4	0.4	2212.8	4.2	2.4	6292.3	2.8	1501
Saudi Arabia	0.4	0.7	425.7	0.6	1026.8	6.2	3.6	6338.4	2.8	1015
South Africa	0.3	0.6	474.1	0.7	1461	3.9	2.2	4399.7	2	1128.6
United Arab Emirates	0.8	1.4	967.1	1.4	1229.9	6	3.4	7167.8	3.2	1200.5
Italy	8.8	15.7	8785.2	12.5	1003.7	8.8	5	9208.3	4.1	1046.5
Kuwait	0.8	1.4	902.6	1.3	1138.2	2.9	1.7	3133.6	1.4	1069
Belgium	3	5.5	3769.2	5.4	1240.8	6.2	3.6	4900.6	2.2	788.9
Sudan	0.8	1.4	1010.7	1.4	1298.1	10.8	6.2	372.5	0.2	34.4
other countries	2.8	5.2	3427.3	4.8	1211.9	11.5	6.6	28952.7	12.7	2526.6
Total	55.7	100	70387.5	100	1263.7	174.9	100	225247.5	100	1287.9

Source: Collected and calculated:

1 - The website of the United Nations, trade map database.

2 - The International Trade Center website, International Trade Center ITC.

3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

5- Competitive position in price for fresh Egyptian grape exports during the two research periods:

The relative export price of goods is one of the most important indicators determining the competitiveness of any country in the world market, as each country seeks to acquire new markets by reducing the prices of its exports compared to the prices of other countries to the extent that it can compete with other countries exporting the same goods.

The relative prices are measured by comparing the export prices of the Egyptian commodity with the export prices of the commodity of the country competing with Egypt in the foreign markets.

If the price ratio is lower than the correct one, it means that there is a competitive price advantage for Egypt in exporting that commodity compared to the competing country and the opposite is true.

By reviewing the data of Table no (5), it was found that the Egyptian grapes have a competitive price advantage in the world market, where the relative price of Egypt to the world price was about 0.67 during the first period (2001-2010), while it was estimated at 0.96 during the second period of research (2011-2020), it is clear from the study of the competitive price ratio (the export price of Egyptian grapes / the export price of grape exports globally, as well as Chile considered as the most important countries in the world in terms of the quantities of exported grapes, estimated at 19.6% ، 17.6% of the total world exports of grapes during the two research periods, respectively),where the relative price of Egypt and both the world price, and the price of Chile were about 0.95 and 0.87, respectively, during the first period of the research, as it was estimated at about 0.74 ، 0.85 respectively during the second research period, which meaning that Egypt's exports of grapes have a price competitive advantage, Which encourages an increase in the amount of Egyptian exports.

Table no (5): The competitive price position of the Egyptian exports of grapes during the two research periods, the first period (2001-2010), the second period (2011-2020).

Statement / Country		Quantity of fresh grape exports (thousand dollars)	Value of fresh grape exports (kg)	Export price of grapes (dollar / ton)	Price ratio (Egypt/competing country or world)
First period	Egypt	55700.9	70647.7	1268.34	1
	world	3282361.9	4362423.7	1329.05	0.95
	Chile	645236.6	945490.5	1465.34	0.866
Second period	Egypt	174979	225635.4	1289.50	1
	world	4511774.9	7862797.6	1742.73	0.74
	Chile	794331.6	1204671.5	1516.59	0.850

Source: Collected and calculated:

1 - The website of the United Nations, trade map database.

2 - The International Trade Center website, International Trade Center ITC.

3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

6- Instability coefficients for Egyptian exports of fresh grapes during the two research periods:

The desired level of agricultural exports requires not only achieving an appropriate return in a certain period of time, but also the stability of this return, Hence, the economic stability of grape exports requires stability in both the export price and the quantity of exports, this can be said that the instability coefficient is the geometric mean of the percentage deviations of the estimated values from the original values, the closer value of this coefficient is to zero, this means that there is stability, and the more value of this coefficient is more than zero, this indicates that there is no stability, the instability coefficient was calculated from[9] the following equation:

$$NS = \left| (Y_i - \hat{y}_i)/ \hat{y}_i \right| \times 100$$

Where:

NS: coefficient of instability of Egyptian exports of fresh grapes in year i.

$\mathbf{Y_i}$: the actual value of the quantity and value of Egyptian exports of fresh grapes in year i.

$\hat{\mathbf{y}}_\mathbf{i}$: the estimated value of the quantity and value of Egyptian exports of fresh grapes in year i from the equations of the general temporal trend of the two search periods.

By reviewing the data of Table no (6), it was found that the quantity, price and value of Egyptian exports of grapes were characterized by high coefficients of instability during the first period (2001-2010), and the export price was the most stable, as the geometric mean of its instability coefficient was about 25.19%, while it was The value of exports is the least stable, as the geometric mean of its instability coefficient is about 64.1%, and it is about 61.1% for the quantity of exports, while the second period of research (2011-2020) was more stable compared to the first period as it was estimated at 26.9%, 16.9% and 11.2% for each of the quantity and price and value each respectively.

Second: Gravity Model for Egyptian Exports of Fresh Grapes:

The results of the research showed that the most important importing countries for Egyptian grapes during the period (2001-2020), are Germany, United Kingdom, Netherlands, Russia and Italy, The percentage of Egyptian exports to these five countries amounted to about 73.60% of the total Egyptian exports of fresh grapes during the research period, And then the research will estimate the gravity model between Egypt and those five countries only due to the difficulty of including all world countries in the analysis of the gravity model, which leads to a loss of degrees of freedom, where the application of the model is subject to a prerequisite that the cross-sectional data (s) does not exceed the number of years for the specified time series (t), thus, the total number of views of the model is 100, which are composite observations that represent cross-sectional data for the five countries, and the series in each country is 20 years.

Model Description:

The current research uses the panel data method by using the Random Effect Model to estimate the gravity model for the flows of fresh grapes between Egypt and the countries of the world during the period (2001-2020), this is due to the presence of variables in the gravitational model that do not change over time, the most important of which is the geographical distance, therefore, the Fixed Effect Model is not suitable for measuring the model and the Pooled Model will be used as a method to measure the gravity model for the collected data, while using the Feasible Generalized Squares (FGLS) method.

The model includes 8 variables explaining Egypt's exports country (i) of fresh grapes to countries (j) per year (t), which are: (LnX_{1i}) logarithm of Egypt's population, (LnX_{2j}) logarithm of the population of

importing countries, (LnX_{3i}) logarithm of Egypt's GDP, (LnX_{4j}) logarithm of importing countries GDP, (LnX_{5ij}) logarithm of the geographical distance in km between Egypt and the capitals of importing countries, ($Ln\ X_{6j}$) logarithm of the exchange rate for the currency of importing countries, (D_{1ij}) dummy variable of the colonial relationship For countries j and Egypt i (if relationship = 1, no relationship = zero), (D_{2ij}) dummy variable for joining the WTO (enrolled = 1, not enrolled = zero).

Table no (6): Instability coefficient for Egyptian exports of grapes during the two research periods, the first period (2001-2010), the second period (2011-2020):

year	Total quantity of fresh grape exports (tons)	Value of fresh grape exports (thousand dollars)	Export price (dollar/ton)	Coefficient of instability of the quantity of exports	Coefficient of instability of the value of exports	Coefficient of instability of the export price
2001	4552	1298	285.15	88.92	58.92	34.06
2002	5993	2162	360.75	87.74	88.24	31.29
2003	7416	3038	409.65	86.92	90.96	33.67
2004	14423	11909	825.70	77.65	75.62	16.27
2005	24602	17278	702.30	65.99	73.03	12.51
2006	27810	21881	786.80	65.31	72.41	12.12
2007	53697	59589	1109.73	38.96	36.96	12.33
2008	199058	161444	811.04	107.80	47.10	24.94
2009	135586	225452	1662.80	30.86	80.40	41.75
2010	83872	202426	2413.51	24.73	44.38	90.70
geometric mean	-	-	-	61.12	64.12	25.20
2011	623197	210413	337.63	422.60	35.37	75.14
2012	116054	225185	1940.35	8.67	31.95	33.75
2013	88144	183730	2084.43	34.65	1.16	35.06
2014	113485	245504	2163.32	20.48	22.07	32.24
2015	166592	241761	1451.22	10.68	11.75	16.04
2016	133794	218696	1634.57	15.50	5.56	10.24
2017	130301	237635	1823.74	21.58	3.71	4.70
2018	120265	221935	1845.38	30.87	15.30	8.02
2019	154207	235299	1525.86	15.18	15.13	27.30
2020	103751	236196	2276.57	45.28	19.24	3.89
geometric mean	-	-	-	26.9	11.2	16.9

Source: Collected and calculated:

1 - The website of the United Nations, trade map database.

2 - The International Trade Center website, International Trade Center ITC.

3 - Food and Agriculture Organization of the United Nations, FAOSTAT database.

Model Estimation:

Several attempts were made to reach the optimal economic and statistical form to express the basic gravity model based on the value of Egypt's exports of fresh grapes and the geographical distance, and to end with the modified model, which works to add the most important factors that affect the interrelationships between countries in the double logarithmic model.

The model estimation encountered many measurement problems such as the autocorrelation between (Z) error values over time, through the Durbin - Watson test, where the D.W value was less than the correct one amounted to about (0.60), and this was treated using the value of exports of Egyptian fresh grapes to the five countries as an independent variable lagged for one time period (t-1), and based on the Klein matrix for simple correlation coefficients between the explanatory variables in the double logarithmic model, it became clear that there is a problem of multicorrenality between many variables and each other, and then it was conducted Many attempts were made to get rid of these standard problems, and it was possible to estimate the gravity model in the presence or absence of dummy variables to reach the best model.

Results of the Basic Gravity Model for Egyptian Exports of Fresh Grapes (BGM):

The basic gravity model for exports reflects the total impact of the five countries on the Egyptian exports of fresh grapes during the period (2001-2020), and the model includes the most important factors affecting the Egyptian exports of the fresh grape crop using the modified gravity model, according to the variables included in the gravity model. The data of Table (7) indicates that the total variables included in the model explain about 69% of the changes that occurred in the Egyptian exports of the fresh grape crop for the group of selected countries (Germany, United Kingdom, Netherlands, Russia and Italy), while the rest of the changes in exports are due To other factors not measured by the model, the significance of the basic model has been proven at the level of significance 0.01.

The results showed that an increase in the population of Egypt by 1% leads to a decrease in the Egyptian exports of fresh grapes by 7.87%, this is due to, when the population of Egypt increases, the demand for the fresh grape crop increases locally, Which leads to a decrease in Egypt's exports of it, and the significance of this relationship was confirmed at the level of significance 0.05, it also became clear that an increase in the population of importing countries by 1% leads to a decrease in Egyptian exports of fresh grapes by 1.01%, this may be due to increase of the population importing countries negatively affects the purchasing power and income levels of its residents, which leads to a decrease in the demand for Egyptian fresh grapes and a decrease in Egypt's exports of it and the significance of this relationship was confirmed at the level of significance 0.01.

It is also clear that an increase in the Egyptian GDP by 1% leads to an increase in the Egyptian exports of fresh grapes to these countries by 4.94%, and this is due to the high level of the Egyptian GDP which refers to the high level of grape production, which increases the facilitation of export quantities, and it is also clear that there is a positive direct relationship between the GDP of the importing countries and the volume of Egyptian exports of fresh grapes, with an increase in the GDP of these countries by 01%, the volume of Egyptian exports of fresh grapes increases by 8.10%, and this confirms that the grape crop is a good commodity that increases the external demand for it by increasing the GDP of the importing countries and thus increases Egypt's exports to these countries, and the significance of this relationship was proven at a significant level of 0.01.

Table no (7): Results of the basic gravity model for Egyptian fresh grape exports during the period (2001-2020):

variable	coefficient	t-statistic	sig
C	- 59.080	- 2.834	0.006
Ln X_{1i}	- 7.866	- 2.490	0.015
Ln X_{2j}	- 1.012	- 4.141	0.000
Ln X_{3i}	4.943	7.307	0.004
Ln X_{4j}	0.809	2.918	0.000
Ln X_{5ij}	9.279	3.903	0.010
Ln X_{6j}	0.449	2.613	
R-squared	0.690		
F	34.534		
P-value	0.000		
D.W	1.907		

Where:

Ln Y_{ij} : Logarithm of the value of Egypt's exports (i) of fresh grapes to the most important importing countries j) per year (t-1) in thousand dollars.

Ln X_{1i}: Logarithm of the population of Egypt, country i, in million people per year ((t.

Ln X_{2j}: logarithm of the population of importing countries j in million people year (t).

Ln X_{3i}: Logarithm of the gross domestic product (GDP) of Egypt country i in billion dollars year ((t.

Ln X_{4j}: Logarithm of the gross domestic product (GDP) of importing countries j in billions of dollars per year (t).

Ln X_{5ij}: logarithm of the geographical distances in kilometers between Egypt, country i, and the capitals of importing countries, countries j.

Ln X_{6i}: logarithm of Exchange rates the currencies of importing countries j against the US dollar year (t).

Source: Collected and calculated:

1 - The website of the United Nations trade map database.

2 - The International Trade Center website. International Trade Center ITC.

3 - Food and Agriculture Organization of the United Nations FAOSTAT database.

The significant effect of the geographical distance between Egypt and the importing countries for fresh grapes was also proven at a significant level of 0.01, as when the geographical distance between Egypt and these countries increased by 1%, it would result in an increase in Egyptian exports to this country by 9.28% with the stability of other factors, and this means that the Egyptian fresh grape crop has high quality specifications that increase its ability to penetrate the foreign markets of the group of selected countries at a high rate, and that the distance does not prevent this.

It also became clear that the exchange rate of the currencies of the countries importing fresh Egyptian grapes against the US dollar has a statistically significant positive effect at a significant level of 0.01 on the exports of Egyptian fresh grapes to the markets of these countries. This led to an increase in the Egyptian exports of grapes to these markets which amounted to about 4.50%, and this explains the increase in the export capacity and the penetration of the export markets for grapes further as a result of the increase in the purchasing power of importing countries to increase their exchange rates against the US dollar, thus increasing the Egyptian exports of fresh grapes to those markets.

VI. conclusion

The research conclude that it should be Working to preserve the main markets (Germany, United Kingdom, Netherlands, Russia and Italy) for Egyptian grapes by paying attention to marketing and promotional activities in order to preserve Egypt's market share in those markets and strategic planning for grape production for export, aiming to open new export markets and The necessity of applying health conditions, standard specifications and quality in international markets, as this leads to the strong presence of Egyptian exports of grapes in the markets, in addition to the stability of the quantity exported and not losing those markets.

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