Estimate the outside demand functions of Orange and grape crops in Egypt

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Abstract: The current research has targeted to identify some of the economic indicators, geographical distribution and locate Egypt for the competition, as well as the Egyptian competitiveness indicators and identify the most important importer of grape and orange crops, through the study of external demand by major global markets. The research has adopted a goal of descriptive and quantitative statistical analysis, in addition to assess economic indicators such as percentages and averages. The study shown, a significant increase in the total productive area, the productivity of the acre and crop production of oranges and grapes, as well as a high proportion of world production of oranges and grapes. The most important foreign markets for Egyptian Orange crop are KSA, Russia, Ukraine, Iran, UAE, and UK markets. While, for grape was UK, The Netherlands, Italy, Germany, Belgium, Russia, and UAE. The Saudi market, showed a direct correlation between national income and the amount of Saudi exports of oranges, while showing an inverse relationship between the total quantity of imports to Saudi Arabia from Orange and the quantity of exports from Egypt. The most important factors affecting the amount of Orange exports to the Russian market is the exchange rate of the pound against the dollar and the price of exportation of Egypt, and the rest of moral agents. The most important factors affecting the amount of exports from the UK market are grape export price Egypt to UK. The UK import price of grapes showing an inverse relationship between the price of exportation of Egypt and UK export quantity of grapes. While, showing an inverse relationship between the price of grapes and UK import quantity of exports from Egypt.
Keywords: *Exports of Egypt*, *Demand functions, International trade*, *Oranges and grapes.*

Introduction:

Vegetable and fruit crops occupy an important place in the national economy, for its importance as a food, in addition to its contribution to exports and national economy in terms of foreign exchange and plug in the Egyptian trade balance of about 4.6 billion dollars during the fiscal year (2012-2013) [2]. Fruit crops Enjoy by increasing the quantity and value of agricultural exports, where these crops are the most important export crops. The total area cultivated by these crops in 2014 are about 388.50, 202.55 thousand acres respectively, representing approximately 2.36% and 1.23% of the total area planted with various crops of 16473.77 thousand acres. While, has about 316.05, 180.50 thousand acres, representing 23%, 13.12% respectively of the total area of fruit 1376.19 thousand acres.

In the recent period, the quantity produced of oranges and grapes has seen a remarkable improvement, where it is increased from 1610 thousand tons in 2000 to approximately 3035 thousand tons of oranges2014.

While, increasing the quantity produced from grapes from approximately 1075thousandtons in 2000 to around 1596.2 thousand tons in 2014, so there is a big chance for Egyptian exporters [7].

Problem:

Selected fruit crops are one of the main components of the Egyptian agricultural exports, so as to contribute to bridging the agricultural trade deficit. Butit faces a decline in quantities exported compared to the quantity of production during the period (2008-2014) with the quantity produced of oranges and grapes, about2.6, 1.4 million tons, while exported approximately 883.5, 194.2 thousand tons representing approximately 33.9%, 13.6% respectively of the total production of oranges and grapes during that period. Although, Egypt has comparative advantages in the production of such crops, as well as the proximity to European and Arabic markets. Whereas, these markets need to a quality and specification of particular note that Egyptian crops often are no longer good setup for export. In addition the quantities exported do not achieve export revenue would be neater, necessitating the need to remove all obstacles and problems of export of these products to improve the efficiency of export.

Goal of research: It requires the subsidiary goals of:

1. Identify some economic indicators crop of grapes and oranges,
2. Study the evolution of the quantity and value of exports for the crop in question,
3. The geographical distribution of exports of such crops and locate Egypt for States competition, and
4. Identify some indicators of competitiveness estimation functions, external demand for exports of the crop survey.

Materials and Methods:

The research data analysis was on the methods of quantitative and descriptive analysis through time-series data for the variables under study. Where, the time trend equations were estimated General linear image. It has also been used by many economic indicators to know the competitive position of Orange and grape harvests in major world functions, such as comparative advantage and market share, market penetration, and finally to estimate demand functions outside of Orange and grape crops Egyptian period (2000-2014).

1.   Revealed comparative advantage index:

The availability of benefits by the State to produce certain commodity, such as natural conditions and climate, raw materials or cheap labor. The comparative advantage index reflect the ratio between the relative importance of the State's crop exports to relative importance of exports of the crop in the world, if the value of the comparative advantage index of crop is more than one it shows the possibility to export the crop feature than for exports this crop in the State as the following equation [1]:

$$RCA_j = (X^j_e/X^a_e)/(X^j_w/X^a_w)$$

Where:

RCA$_j$ is the comparative advantage, (x^j_e) is the State exports (e) of item (j) to the world, (X^a_e) is the State exports (e) to the world, (X^j_w) is the total value of world exports of goods (j), and (X^a_w) is the total value of world agricultural exports.

2.   Market share:

Market share is one of the competitiveness indicators that the increase of it, is one of the main objectives of the expansion process of any State foreign sales. So that, the high market share rise reflects the competitive position of any State, and market share index reflects the % age of a State's exports of certain commodity in a given market to imports of that market from different countries of the world from that commodity and is calculated by the following equation [5]:

$$MSH_{ji} = (X_jc_i/Mcw_i)\ 100$$

Where:

MSH$_{ji}$: market share for State j of item I, X$_j$c$_i$: exports the State j to State c of item I, and Mcw$_i$: total quantity of imports of State c of world commodity i.

3. Market Penetration rate

The market penetration rate is one of the most important criteria for measuring competitive State, defined as the ratio between the quantity of imports of a certain commodity from another State (to measure the rate of penetration of the market), and the actual consumption of that commodity. The higher the value of this indicator in a given market demonstrates the breadth of the market and ease of entry and vice versa. From the competitiveness point of view, market penetration rate shows how much of a real market for the product, and can be calculated from the following equation [5]:

MPR$_j$c$_i$ = Mc$_{ij}$ / (Qc$_i$+Mc$_i$-Xc$_i$)

Where:

MPR$_j$c$_i$: market penetration rate (j) of commodity (i) in State (c), Mc$_{ij}$: State imports c of commodity (i) in state (j), Qc$_i$: quantity production (c) of the commodity (i), Mc$_i$: the total amount of commodity (c) imports by State (i), and Xc$_i$: exports of goods (i) State(c).

Search adopted many published and unpublished data issued by the Central Department of agricultural economics, Ministry of agriculture, the World Wide Web for all of the food and Agriculture Organization (FAO), the United Nations, the World Bank database with some research and previous studies that have a close relationship with the same domain.

Results and discussion:

1. Study the evolution of economic indicators that affect Egypt's exports of Orange and grape crop:

This part of the study includes some statistical and economic indicators for the main variables that affect the exports of Egyptian oranges and grapes during the period (2000-2014). This through estimating the General variables time equations trend under study, which is the size of total productive area, the productivity of the acre, the total production of oranges and grapes, quantity and value, the price of exports and imports as well as global, and global production of crops under investigation.

1.1. Evolution of the total productive area, the acres production and the total production of both oranges and grapes:

The results of estimating the general time trend shown in tables (1, 2) indicates, a significant increase in total and productive area, as well as the productivity of the acre and total production of oranges and grape crops, it reached about 14.175 thousand acres, 8.19 thousand acres, 0.114 tons/acre, 99.8 thousand tons of Egyptian oranges respectively during the period (2000-2014), representing approximately 4.96%, 3.39%, 1.22% 4.53% of the total average area, fruitful, productive acres and total production of oranges. While, for grape it reaches approximately 3.36 thousand acres, 2.83 thousand acres, 0.038 tones to the acre, 29 tons of grapes respectively, representing around 1.92 %, 1.82 %, 2.17% of the average total area, and total production. This increase has proven a statistically significance at 0.01. A value of the coefficient of determination (R^{-2}) that about 92%, 83%, 62%, 94% of the changes in total area, and the productivity of the acre and total production of oranges, about 87%, 95%, 59% of the changes in total area and fruit and grape production but due to time change factors.

1.2.Study the evolution of the quantity and value and export price for each of Orange and grapes:

Studying the evolution of the quantity, value and price of exports of Egypt oranges and grapes during the study period, the results shown in tables (1, 2) that these variables take increasing statistically significant trend about 57.83 thousand tons, 38.14 million dollars, 33.6 dollars per ton of oranges, respectively, representing approximately 12.8%, 17.3% 6.86% from average amount, value and price of exports Egypt from Orange. While, for grape it is about 6.6 thousand tons, 15.8 million dollars, 181 $ per ton for grapes respectively, representing about 14.74%, 19.3%, 9.87% of grapes respectively. Explaining the value of the

coefficient of determination (R^{-2}) changes the time by about 73%, 75%, and 80% of the changes in quantity, value, the price of exports of Egypt from oranges respectively, and approximately 60%, 73%, 75% of the grapes, respectively.

1.3. Evolution of the quantity and value, the rate of world exports of both oranges and grapes:

The results of the general time trend described in table (1, 2) that these variables have taken an increasing trend to increase morale in quantity and value, the rate of world exports of both oranges and grapes during that period, reaching nearly 158.2 thousand tons, 221.7 million $, 23.9 $/ton of oranges respectively, representing about 2.8 %, 6.74%, 4.1% of average Quantity, value and price of world exports of oranges. While, it is approximately 91.3 thousand tons, 300.7 million$, 55.7$ per ton of grapes respectively, representing about 2.65 %, 5.07 %, 3.23% of grapes, respectively. The value of the coefficient of determination (R^{-2}) changes the time by about 83%, 88%, 86%, of the changes in quantity and value, the price of exports of Egypt from Orange, respectively, as estimated at 84%, 88%, 88% of grapes, respectively for the same period.

1.4. Evolution of the value of total agricultural exports, Egyptian and international:

The results of the measurement of the general time trend shown in tables (1, 2), the value of total the Egyptian and international agricultural exports, took a growing trend where approximately 46, and 66954 thousand tons, respectively during the period (2000-2014), representing about 4.6 percent, 8.25% from an average of about 998.8, and 811398thousand tons respectively. As well as, the coefficient of determination (R^{-2}) changes the time, estimated at 78%, and 89% of the changes in the value of agricultural exports Egyptian and international respectively, and other changes to other factors not considered other than time.

1.5. The evolution of the global production of oranges and grapes:

The findings contained in the table (3) that the minimum of the global production of crop of oranges and grapes about 60.1, and 61.4 million tons in 2001 respectively, while the Max about 67.7, and 68.2 million tons in 2014, respectively. The results of the equation of general time trend that world production (2000-2014) has taken an increasing statistically moral trend about 653.2, and 411.3 tons of oranges and grapes respectively, representing 0.99 %, and 0.62% of the average global production of oranges Grapes, respectively. The value of the coefficient of determination (R^{-2}) changes the time by about 71%, and 53% of changes in world production of oranges and grapes, respectively.

The table (3) shows the global production of oranges and grapes, where production rose Egyptian world of 2.52 %, and 1.66 % in 2000 respectively to around 4.56, and 2.34% in 2014, respectively, with an average of about 3.45, and 2.01 % to oranges and grapes, respectively.

Table (1) the overall time trend equations for the main economic variables of the Orange during the period (2000-2014)

Economic variables	Equation	Average	T value	R^2	F	Change rate %
Total area (thousand acres)	ˆY=164.13+13.479Xˆ	272	12.351	0.92	152.56**	4.96
Productive area (thousand acres)	ˆY=168.22+7.815Xˆ	230.75	8.407	0.83	70.68**	3.39
Acre productivity (tons/acre)	ˆY=8.58+0.1157Xˆ	9.51	4.92	0.62	24.16**	1.22
Total production (thousand tons)	ˆY=1404.58+99.801Xˆ	2203	15.153	0.94	229.63**	4.53
Egyptian Agricultural export value (million $)	ˆY= 631.1+45.963Xˆ	998.8	7.041	0.78	49.57**	4.6
Egyptian export quantity (thousand tons)	ˆY=- 12.2+57.839Xˆ	450.5	6.283	0.73	39.48**	12.8
Egyptian export value (million $)	ˆY=- 84.2+38.140Xˆ	220.9	6.618	0.75	43.79**	17.3
Egyptian export price ($/ton)	ˆY= 132.4+33.63Xˆ	490	7.607	0.80	57.87**	6.86
Global production quantity (thousand tons)	ˆY=4320.6 +158.159Xˆ	5585.5	8.367	0.83	70.02**	2.8
Global agricultural export value (million $)	ˆY= 1517.3+221.658Xˆ	3290.6	10.330	0.88	106.70**	6.74
Global export price ($/ton)	ˆY= 384.2+23.934Xˆ	589	9.234	0.86	85.08**	4.1
Global production quantity (thousand tons)	ˆY= 60604.8+653.2Xˆ	65830.7	5.81	0.71	35.78**	0.99
Global agricultural export (million $)	ˆY= 275765+66954Xˆ	811398	10.900	0.89	118.82**	8.25

Where: y ^ n = estimated value of all economic variables for the crop in a year n
X_n = refers to the time factor, n = 1, 2, 3,............ 15
Source: [10,11]

Table (2) the overall time trend equations for the main economic variables of the grape during the period (2000-2014)

Economic variables	Equation	Average	T value	R^2	F	Change rate %
Total area (thousand acres)	ˆY=141.001+3.205Xˆ	166.65	9.850	0.87	97.02**	1.92
Productive area (thousand acres)	ˆY=126.29+2.689Xˆ	147.81	16.408	0.95	269.22**	1.82
Acre productivity (tons/acre)	ˆY=8.701+0.037Xˆ	9.00	1.029	0.004	1.059 -	0.41
Total production (thousand tons)	ˆY=1101.56+28.98Xˆ	1333.42	4.598	0.59	21.14**	2.17
Egyptian export quantity (thousand tons)	ˆY= -8.0+6.573Xˆ	44.6	4.722	0.60	22.30**	14.74
Egyptian export value (million $)	ˆY= - 44.65+15.802 Xˆ	81.8	6.176	0.73	38.14**	19.32
Egyptian export price ($/ton)	ˆY= -114.6+ 181Xˆ	1834	6.577	0.75	43.26**	9.87
Global production quantity (thousand tons)	ˆY= 2718.2 +91.264Xˆ	3448.3	8.640	0.84	74.66**	2.65
Global agricultural export value (million tons)	ˆY= 2124.2+300.738Xˆ	5934.6	10.367	0.88	107.47**	5.07
Global export price ($/ton)	ˆY= 878 +55.672Xˆ	1721	10.082	0.88	101.64**	3.23
Global production quantity (thousand tons)	ˆY= 63120.9+411.3Xˆ	66411.2	4.114	0.53	16.92**	0.62

Where: y ^ n = estimated value of all economic variables for the crop in a year n
X_n **= refers to the time factor,   n = 1, 2, 3,............ 15**
Source: [10,11]

2.   Indicators of competitiveness of Orange and grape crops:

This section includes some indicators of competitiveness of Orange and grape crop, such as comparative advantage, price competitive position, and the coefficient of penetration.

2.1. The comparative advantage index phenomenon Revealed Comparative Advantage: 2.1.1. Orange:

Data in table (4) shown that the comparative advantage of Orange is greater than 1 in all years of the study, which confirms the availability of comparative advantage of Egyptian oranges in foreign markets. In addition, we noted that there is a decrease this scale in some years due to lower exports of Egyptian oranges. It was reaching the highest level in 2011 with approximately 103.5, while the lowest level of 2001, it was estimated about 4.2, and an annual average of about 45.5 during Study.

Table (3) the evolution of Egyptian and global production of oranges and grapes during the period (2000-2014)

Year	Orange			Grape		
	Production (thousand tons)	Global production (thousand tons)	% from global production	Production (thousand tons)	Global production (thousand tons)	% from global production
2000	1610.5	63808.8	2.52	1075.1	64848.0	1.66
2001	1696.3	60098.1	2.82	1078.9	61431.1	1.76
2002	1808.6	62092.1	2.91	1073.8	62030.3	1.73
2003	1767.7	59759.5	2.96	1196.9	63560.0	1.88
2004	1850	64964.8	2.85	1275.3	67712.8	1.88
2005	1940.4	63115.4	3.07	1391.7	67406.4	2.06
2006	2120	66048.5	3.21	1432	67254.1	2.13
2007	2054.6	65594.0	3.13	1485	65422.0	2.27
2008	2138.4	69551.4	3.07	1531.4	67461.0	2.27
2009	2372.3	67788.0	3.50	1370.2	68294.2	2.01
2010	2401	69045.5	3.48	1360.5	67460.1	2.02
2011	2577.7	69759.3	3.70	1320.8	69992.1	1.89
2012	2716.4	68223.8	3.98	1378.8	67067.1	2.06
2013	2855	68873.6	4.15	1434.7	68054.9	2.11
2014	3135.9	68738.0	4.56	1596.2	68173.7	2.34
Average	2203.0	65830.7	3.45	1333.42	66411.2	2.01

Source: : [10].

2.1.2. Grapes:

Data in table (4) shown that the comparative advantage of the grapes is less than 1 during the period (2000-2003), confirming the lack of comparative advantage to the Egyptian market grape timings during this period. Starting from 2004, Egypt has a comparative advantage of the phenomenon of increased value from 1

until 2014, reaching the highest level in 2011 with approximately 32.3, and an annual average of approximately 11.19 during the study period.

2.2. Geographical distribution and market share of exports of oranges and grapes:

This section explains the most important importer markets of Egyptian oranges and grapes. As well as, the proportion represented by exports to total imports of oranges and grapes, to determine priorities and policy directions for the crop in the future and work to improve conditions in foreign markets.

Table(4) comparative advantage index of grapes and oranges in Egypt during the period (2000 – 2014) (value: $ 1 million).

Year	Agricultural Egyptian exports value	Agricultural global exports value	Orange			Grape		
			Egyptian orange export value	Global orange export value	comparative advantage of the phenomenon	Egyptian grape export value	Global grape export value	comparative advantage of the phenomenon
2000	518.3	412216.5	16.6	1716.1	7.693	1.9	2502.4	0.604
2001	614.4	413374.8	50.6	1849.5	18.407	1.3	2493.1	0.351
2002	774.2	441142.7	26.5	2063.9	4.316	1.8	2693.7	0.381
2003	860.3	465115.8	39.2	2441.9	8.679	2.9	3135.5	0.500
2004	986.4	488213.6	76.9	2798.1	13.602	11.4	3292.7	1.714
2005	918.3	653866	74.9	2581.0	20.663	16.8	3956.9	3.023
2006	855.3	721855	65.3	2732.3	20.170	21.9	3987.6	4.635
2007	1202.5	873821	99.1	3174.2	22.687	59.7	4934.0	8.792
2008	1141.6	1059038	239.0	3810.3	58.188	91.9	5615.9	15.181
2009	1177.1	946843	494.7	4114.4	96.716	225.4	5666.5	31.996
2010	1177.1	1002941	397.5	4529.4	74.775	115.0	6219.7	15.754
2011	1211.7	1122851	538.2	4820.1	103.470	210.1	6026.6	32.306
2012	1182.0	1336881	353.7	4089.7	97.818	140.42	5692.5	27.899
2013	1177.9	1093711	404.7	4272.8	87.928	156.56	5844.3	24.875
2014	1185.2	1139096	437.7	4365.3	96.381	196.50	5889.9	27.859
average	998.8	811398	220.9	3290.6	54.552	81.77	5934.6	11.193

Source: [10].

2.2.1. Geographical distribution and market share of exports of the Orange crop:

Reviewing the geographical distribution of exports of Egyptian oranges to various world markets during the period (2007-2014), it has proved to be divided into nine important markets according to their relative importance in terms of quantity exported. In addition to other less important group of States, where average annual quantity and value of imports of Egyptian oranges are about 610.7thousand tons, and 318.8 million dollars representing approximately 75.7%, and 75.3% of the average of the quantity and value of the total exports of Egyptian oranges are about 807thousand tons, 423.7 million dollars, respectively of the same period, as shown in table (5).

The Saudi market was in first place among the most important importer of Egyptian oranges by the quantity and value of exports amounted to about 176.7 thousand tons, 85.9 million dollars, respectively, with an estimation 21.9%, 20.3% respectively of average and total exports of Egyptian oranges. While, occupied all of Russia, Ukraine, Iran, UAE, UK from second place until the quantity of exports amounted to 159.6, 65.11, 51.3, 50.09, 46.2thousand tons, representing approximately 19.7%, 8.07%, 6.36% 6.21% 5.73%, respectively of average. Total export amount of Egyptian oranges, and the value of Egyptian oranges about 87.8, 35.58, 31.15, 24.93, 21.54 million dollars representing about 20.7%, 8.4%, 7.35% 5.88%, 5.08% of the average value of the total Egyptian exports of oranges. Also, the same data table above also about7.64, 7.55 % of total export value and quantity of Egyptian oranges respectively are to the Netherlands, Oman, Malaysia. The coefficient of the geographical concentration of both the quantity and value of Egyptian exports of oranges have reached approximately 32.7% and 32.4%, respectively, where concentrated 68.05% of the Egyptian exported amount of oranges and of about 708 thousand tons in six States, namely Saudi Arabia, Russia, Ukraine, Iran, UAE, United Kingdom, and the exported value of these States towards the 67.7% of the total export value of about 423.7 million dollars during the period.

A study of market share of oranges during the period (2007-2014) shows that the Saudi market occupies the first rank, where Saudi imports averaged of Orange is about 52 % of Saudi imports of oranges from all over the world, followed by Ukrainian market with an average share of about 50%, Oman was ranked third with an estimated share of this market of Egyptian oranges is by about 42%.While, fourth place until the ninth Iran, Russia, UAE, Malaysia, UK, and Netherlands, where about 36.9%, 32.2%, 27.6%, 10.4%, 7.6%, and 6.87% respectively during the same period.

Table (5): The geographical distribution of the quantity and value of exports from the Egyptian Orange (2007-2014).

State/year	Export quantity (1000tons)	% from the total	Export value (million$)	%of export value	Price ($/ton)	Import (1000ton)	Market share
KSA	176.73	21.90	85.90	20.28	486.07	339.19	52.10
Russia	159.63	19.78	87.80	20.72	550.03	495.74	32.20
Ocarina	65.11	8.07	35.58	8.40	546.47	129.57	50.25
Iran	51.30	6.36	31.15	7.35	607.16	138.73	36.98
UK	46.22	5.73	21.54	5.08	466.08	608.02	7.60
UAE	50.09	6.21	24.93	5.88	497.64	181.08	27.66
Malaysia	9.59	1.19	5.03	1.19	525.10	91.99	10.42
The Netherlands	34.33	4.25	17.91	4.23	521.59	499.69	6.87
Oman	17.75	2.20	9.01	2.13	507.32	41.93	42.33
Other state	196.29	24.32	104.83	24.74	534.08	-	-
Total	807.03	100	423.68	100	524.98	-	-
Geographical concentration coefficient	-	**32.7**	-	**32.4**	-	-	-

Source: [11].

2.2.2. Geographical distribution and market share of exports of grape:

Study the geographical distribution of grape exports to various countries in the world market during the period (2007-2014) has proved to be divided into nine important markets according to their relative importance in terms of quantity exported. In addition to, other less important group, average annual quantity and value of imports of Egyptian grape around 155.2 thousand tons, and 166.8 million $, representing about 87.8%, 88% of the average amount of total exports value of the Egyptian grapes,whicharethousand176.65thousand tons, and 188.9 million dollars respectively, for the average of the same period as shown in table (6).

This the United Kingdom market was in first place among the most important importer of Egyptian grape quantity and value of exports amounted to about 62.23thousand tons, and 68.11million dollars respectively, representing approximately 35.2%, 36.5% respectively, of the average and the total exports of Egyptian grape. While, all of the Netherlands, Italy, Germany, Belgium, Russia, the UAE occupied from the second to the ninth place, where the quantity of exports amounted to 31.4, 65.11, 11.7, 13.5, 10.16, and 9.14thousand tons representing approximately 35.2%, 17.79 %, 10.64 %, 7.64% 5.75%, and 5.17% of the average amount of the total Egyptian exports grapes. However, the value of Egyptian grapes are about 17.28, 37.87, 15.46, 8.8, 9.29, and 5.01million$, representing approximately 2.05%, 9.15%, 8.18 %, 4.92%, 4.66%, and 2.65% of the average value of the total Egyptian exports of grape. As data show in the same previous able indicates that approximately 2.97 %, and 2.67% of total export value and quantity of grapes on order is the Saudi, South Africa. Also, the coefficient of geographical concentration of both quantity and the value of Egyptian exports of oranges had reached about 42.4% and 43.7% respectively. Where, 84.8% of the quantity of grape exports of around 176.65 thousand tons in seven countries United Kingdom, Netherlands, Italy, Germany, Belgium, Russia Federation, and UAE. The total exports to these countries are about 85.6 % of the total export value of about 188.9 million $ during the period.

Table (6): The geographic distribution of the quantity and value of exports from Egypt of grapes during the period (2007-2014)

State/year	Export quantity (1000tons)	% from the total	Export value (million$)	%of export value	Price ($/ton)	Import (1000ton)	Market share
UK	62.23	35.22	68.11	36.05	1094.56	368.03	16.91
The Netherlands	31.42	17.79	37.87	20.05	1205.20	386.18	8.14
Italy	18.80	10.64	17.28	9.15	919.41	43.74	42.98
Germany	13.51	7.64	15.46	8.18	1144.85	80.20	16.84
Belgium	10.16	5.75	8.80	4.66	865.91	434.34	2.34
Russia	9.14	5.17	9.29	4.92	1017.24	381.18	2.40
UAE	4.70	2.66	5.01	2.65	1066.55	45.81	10.25
KSA	3.40	1.92	2.83	1.50	832.81	38.13	8.91
South Africa	1.85	1.05	2.20	1.17	1187.80	3.96	46.76
Other state	21.46	12.15	22.05	11.67	1027.73	-	-
Total	176.65	100	188.91	100	1069.37	-	-
Geographical concentration coefficient	-	**42.4**	-	**43.7**	-	-	-

Source: [11].

Studying the market share of the grapes during the period (2007-2014) shows, that the South Africa market holds the first place in terms of market share for Egyptian grape with an average 46.7% from South Africa imports of grapes all over the world. Followed by Italian market with an average share of approximately 42.9%, while UK took third place with an estimated market share of grapes with about16.9%. Then followed by Germany, UAE, Saudi Arabia, the Netherlands, Russia, Belgium, occupying the order from the fourth to the ninth where their market share amounted to 16.8%, 10.25%, 8.9%, 8.14%, 2.4% and 2.3% respectively during the same period.

2.2.3.   Market Penetration Ratio:

It is clear from the table (7) that Egyptian exports of oranges were concentrated in four countries ranked in terms of penetration rate of Egyptian oranges, both markets were Russia, Iran, Netherlands, Malaysia, of which the most important. So far, as the penetration rate in each of approximately 32%, 3%, 3%, and 8%, respectively, indicating a low rate of market penetration of the values most important importer of Egyptian oranges during the period (2007-2014).This demonstrates the weakness of the porous Egyptian oranges to those markets, which means That Egypt does not have a competitive advantage in this market. Also, that there are still opportunities for Egyptian oranges to fill the needs of these markets of Egyptian oranges through the study and knowledge of their needs and desired specifications and implemented to increase the share of export to Egypt and thus raising the rate of penetration of Egyptian oranges.

It can be seen from table (8) that the Egyptian exports of grape concentrated in five countries ranked in terms of penetration rate of Egyptian grape, all markets were from Italy, Russia, Saudi Arabia, Germany, the Netherlands, are the most important. So far, as penetration rate of grapes in each of about 0.3%, 2%, 1%, 1%, and 3%, respectively, indicating a low rate of market penetration of the values of most important importer of Egyptian grape during the period (2007-2014). Also, demonstrates the weakness of the porous Egyptian grape for those markets, which means that Egypt does not have a competitive advantage in this market, and that there are still opportunities for Egyptian grape to meet the needs of these markets from Egyptian grape, through study and know their needs and desired specifications and implemented to increase the share of export to Egypt and thus raising the rate of penetration of Egyptian grape.

Table (7): The rate of penetration of markets to Egyptian exports of oranges for the main importing country during (2007-2014) (quantity in thousand tons)

State	Imports from Egypt	Production[1]	Total imports	Total exports[2]	Penetrating rate
Russia	159.63	0.12	495.74	4.53	0.32
Iran	51.3	1718.83	138.73	3.14	0.03
The Netherlands	34.33	831.79	499.69	321.93	0.03
Malaysia	9.59	22.73	91.99	1.60	0.08

Source: [10,11].

Table (8): The rate of penetration of markets to Egyptian exports of grape for the main importing country during (2007-2014) (quantity in thousand tons)

State	Imports from Egypt	Production[1]	Total imports	Total exports[2]	Penetrating rate
Italy	18.8	7175.63	43.74	481.43	0.003
KSA	3.4	149.23	38.13	4.38	0.02
Russia	9.14	334.61	381.13	0.57	0.01
Germany	13.51	1218.46	80.2	44.03	0.01

Source: [10,11].

3. Statistical estimation of functions of external demand for oranges and grapes in Egypt:

The study of determinants of external demand for agricultural crops is important when developing EDC policy and identify the reasons for the increase or decrease in export volume and see how much competition they face crop import markets. Based on the principles, norms of economic theory, economic logic and nature of the data available, it has been identified the main factors believed to influence the quantity of exports 1,000 tons as the dependent variable (y) are the: Population of millions for each State (x_1), the national income of each State 1 billion\$ (x_2), the exchange rate of the pound against the dollar (x_3), the total quantity of imports of State that is to export 1,000 tons (x_4), export price Egypt \$/ton for each crop at the end (x_5), export price competitive States for both crops \$/ton for Orange crop where the export price has been selected for South Africa (x_6), export price Zimbabwe (x_7), for the grape the export price has been selected for Spain (x_6), export price Turkey (x_7), and the price of import State for each crop is for export (x_8). It has been using the method of progress Stepwise regression for linear and log it models to identify the main determinants of external demand for Egyptian export crops under investigation in the most important import market. Where, the study found the best mathematical models appropriate and consistent with economic logic and statistics, as shown in the table (9) with the following results:

3.1. External demand function on orange:

3.1.1. external demand function:

The results of equation (1) at the liner scale in table (9) the amount of Orange exports to Saudi Arabia during the period (2000-2014) are affected by Saudi national income, and the total quantity of imports of the oranges, which show a direct correlation between national income and the amount of exports to Saudi Arabia from Orange. So, the more national income in one unit the more Egyptian exports to Saudi Arabia from Orange which is about 0.701 thousand tons. While, showing the existence of an inverse relationship between the total amount of imports to Saudi Arabia from Orange and the quantity of exports from Egypt, where the coefficient of determination was 0.71, which indicates that 71% of the changes in the amount of Egyptian exports of oranges to Saudi Arabia back to variables (x_2), (x_4) and spirits the rest of the factors.

As shown in equation (2) in a double logarithmic scale image table (9) that the gross national income and the exchange rate of the Egyptian pound against the dollar, one of the most important factors affecting the amount of Orange exports to Saudi Arabia, because the Saudi national income increased by one unit leads to the increase of Egyptian exports by 4.42 thousand tons. This had proved the significance of the forms, and the selection coefficient of about 0.73, indicating that 73% of the changes in the quantity of exports to Saudi Arabia from Orange due to the change in the variables (x_2), (x_3) and the rest of the factors were not proved.

3.1.2. External demand function of Russia:

Studying the relationship between the amount of Orange exports to the Russian market is evident from the linear equation (3), the most important factors affecting the amount of Egyptian exports of oranges is the population of Russia, and the Russia imported price of Orange. Where, the higher the number of the population, the higher the quantity of Orange exports to the Russian market and the lower the price of import one unit has increased the amount of Orange exports to the Russian market by about 0.338 thousand tons. This coefficient selection of about 0.93 indicating that 93% of the changes in the amount of Egyptian exports of oranges due to change in variables, did not prove the rest of moral agents.

The findings of the logarithmic equation (4) in table (9) shown the most important factor affecting the amount of Orange exports to the Russian market is the exchange rate of the pound against the dollar and the price of exportation of Egypt. This means that a decrease of 1% of exchange rate and export price of Egyptian Orange exports leads to increase the Egyptian exports to Russian by 5.02 thousand tons. The coefficient of determination is about 0.87, indicating that 87% of the changes in the amount of Egyptian exports of oranges to the Russian market due to the change in the exchange rate and export price Egyptian oranges and the rest of the factors has not been proved.

Table (9): The statistical estimation of functions of external demand for oranges and grape crop for most importing markets in period(2014-2000)

crop	Equation No.	Market	Model type	Function	R^2	F
orange	1	KSA	Linear	$Y=378.5+0.701 X_2-1.828 X_4$ (5.26)** (-3.73)**	0.71	14.58
	2		Logarithmic	$Lny=-5.29+4.42ln X_2-10.06ln X_3$ (5.52)** (-4.83)**	0.73	15.9
	3	Russia	Linear	$Y=-3362.2+22.81 X_1-0.336 X_8$ (12.29)** (4.07)**	0.93	79.6
	4		Logarithmic	$Lny=-10.28-5.02ln X_3+0.999ln X_5$ (5.68)*(2.50)**	0.87	38.66
grape	5	UK	Linear	$Y=-197.8-0.66 X_5-0,147 X_8$ (-4.65)** (6.18)**	0.76	19.19
	6		Logarithmic	$Lny=-29.11-0.817ln X_5+5.068ln X_6$ (-3.01)* (8.59)**	0.89	49.44
	7	The Netherlands	Linear	$Y=-1452.9+90.71X_1-6.57 X_3-.03X_5+0.076X_7$ (9.09)** (-2.65)* (-8.09)**(4.24)**	0.95	53.01
	8		Logarithmic	$Lny=-25.94 +3.814ln X_6$ (9.19)**	0.87	84.5

Source: Calculated from: Source: Source: [2, 11,12]

1. World Trade Organization = www.comtrade
2. Network of the World Bank = www.worldbank.org
3. Central Agency for public mobilization and statistics external trade bulletin – different numbers.

3.2. External demand function of grape:

3.2.1. External demand function for the United Kingdom:

It can be seen from equation (5) in the linear scale, table (9) shown that the quantity of grape exports to the United Kingdom during the period (2000-2014) the price of exportation of Egypt (dollars per ton) to the United Kingdom, and the United Kingdom import price of grapes showing the existence of an inverse relationship between the price of exportation of Egypt and United Kingdom export quantity of grapes. So that, the lower the export price of Egypt grapes one unit more Egyptian exports to the United Kingdom from grapes by about 0.66thousand tons, while showing the existence of an inverse relationship between United Kingdom import price of grapes and the quantity of exports from Egypt. This coefficient was 0.76 selection which shows that 76% of the changes in the quantity of grape exports to United Kingdom affected by variables (x_5), and (x_8), while the rest of the factor have not been proved.

As the results of equation (6) in double logarithmic image, shown in table (9) that the existence of an inverse relationship between the export price and the amount of exports to United Kingdom of Egypt grapes. So that, the lower the export price Egypt grapes one unit the more Egyptian exports to the United Kingdom from grapes by about 0.817thousand tons. It turns out that Spain export price ($/ton) of the most important factors influencing the quantity of grape exports to the United Kingdom where the increased the price of exportation of Spain with single unit leads to Increased exports by 5.068 thousand tons. The form had been proved significantly, and the selection coefficient of approximately 0.89 indicating that 89% of the changes in the quantity of exports to the United Kingdom of the grape due to change in variables (x_5), (x_6) and the rest of the factors have not been proved.

3.2.2.   External demand function for Netherlands:

A study of the relationship between the quantities of exports of grapes to the Dutch market is evident from the linear equation (7). The most important factors affecting the amount of Egyptian exports of grapes are the population of the Netherlands, the exchange rate of the pound against the dollar, export price Egypt of grape, and Turkey price to export grapes. Where, the greater the population and export Turkey price, the more quantity of exports of grape for the Dutch market. While, the lower the exchange rate of the pound against the dollar, the export price for a single unit has led to an increase in the amount of Grape exports to Dutch market about 6,025, 0.03 thousand tons, respectively. The coefficient was 0.94 specifically suggesting that 94% of the changes in the quantity of exports of the grapes was due to the change in the previous variables and the significance of rest factors were not proved.

The results of equation (8) in a double logarithmic image shown in table (9) illustrates, the existence of a direct correlation between the export Spain price and Egyptian quantity exports to the United Kingdom from grapes. So that the higher Spanish export price of grapes one, the more unit of Egyptian exports to the United Kingdom from grapes by about 3.814 thousand tons. The coefficient of determination was about 0.87, indicating that 87% of the changes in the quantity of exports of grape for the Dutch market is due to the change in the Spanish export price of grapes, while the rest did not demonstrate moral factors

Recommendations:

- The state adopted the concept of production for export not exporting surplus based on domestic consumption.
- Indicates a decline in the values of the rate of market penetration on a weak porous Egyptian grape and Orange for those markets, which means that Egypt does not have a competitive advantage in this market, and that there are still opportunities to meet the needs of these markets, study and learn about their needs and desired specifications and implemented to increase the share of export to Egypt and thus raising the rate of market penetration of crop survey.
- Support and development agencies operating in the export of fruit crops in General, oranges and grapes.
- The need to open new markets for exports of oranges and grapes, as well as to study markets competition for Egypt in markets both crops.

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