

Competitiveness Of Egyptian Potatoes Exports In The Most Important World Markets

Gaber A. B. Shehata

Dept. of Agricultural Economics,
Faculty of Agriculture, Alexandria University, Egypt

Amal A. Elgabery

General Director and Director of International Practices Research
Egyptian Customs Authority, Egypt.

Ali K. A. Alskran

Omar El-Mochtar University, Libya.

ABSTRACT

The competitiveness of exports of potatoes was measured by calculating some of the competitiveness indicators including market share index, market penetration rate, price ratio index, virtual comparative advantage index, geographical concentration index (Gini Hirschman) and the index of instability. The measurement of the external demand function on the quantity of Egyptian exports of potatoes in the world markets depends on the total domestic production of potatoes. It was also found that this variable explain about 39.7% of the changes in the quantity of Egyptian potato exports to the world markets. A study of the forecast results of the selected models until 2024 shows that the value of agricultural exports of potatoes crop is expected to reach about \$ 277.7 million in 2024, with an increase of about 77.4% compared to 2018. The research, based on its findings, reached some recommendations that could benefit the Egyptian economic policy makers in this field.

Keywords: Potatoes crop –Egyptian exports - Competitiveness - World markets, Competitiveness

INTRODUCTION

Foreign trade plays an important role in any economy. Through foreign trade, countries can get everything they need from others in exchange for exporting their surplus production and benefit from the field of international specialization on which it is based. Export is one of the main pillars on which the Egyptian national economy depends on providing its foreign exchange needs that can be used to finance economic development programs in general [7], There was a fluctuation in the quantity and value of Egyptian agricultural exports, whether directed to the Arab markets or to the markets of other countries, at the same time as the increase in the quantity and value of Egyptian imports in general, which in turn led to a steady increase in the Egyptian trade balance deficit, Especially during the last few years [1]. Therefore, the development of Egyptian agricultural exports

is one of the most important objectives of economic planners and policy makers in light of the simultaneous local, regional and global economic changes [2].

The Egyptian agricultural economic policy aims at developing and diversifying agricultural exports in which Egypt enjoys a competitive advantage in world markets, as well as the development of non-traditional exports, especially vegetables and fruit crops. Rely on them to increase Egyptian agricultural exports in the coming years, especially after the establishment of the World Trade Organization (WTO) [4]. It should be noted that the role of agricultural marketing in the light of contemporary global economic changes is no longer limited to delivering the product to the consumer, but also includes the work of innovation and innovation, both on the consumption and production or in marketing methods themselves in line with the latest modern technologies that create a competitive advantage [3].

Egyptian agricultural foreign trade is characterized by special features, most notably: the majority of Egyptian agricultural exports of raw materials, and the low relative importance of exports from manufacturing industries. In the world economy, the establishment of the World Trade Organization and some other economic blocs poses a reality that poses a challenge to agricultural exports in particular. But the Egyptian agricultural exports in the coming years, especially after the establishment of the World Trade Organization [5, 6].

This is in addition to the role that agricultural marketing can play in light of the contemporary global changes. Therefore, the following question arises: What is the future of Egyptian agricultural exports and the means of development in the context of globalization?

Based on the research problem, the research aims in general to study the reality and the future of Egyptian agricultural exports of potatoes and means of development in the light of globalization.

The research relied on the method of descriptive analysis through the use of arithmetic, geometric averages and percentages. During study (2002-2018). Box-Jenkins (ARIMA) models were used to predict the value of Egyptian exports of potatoes and grapes.) With the self-regression method with the moving average, as shown by the following equation:

$$Y_{it} = \beta_0 + \beta_1 Y_{it-1} + \beta_2 Y_{it-2} + \dots + \beta_p Y_{it-p} + \epsilon_{it} + \theta_1 \epsilon_{it-1} + \theta_2 \epsilon_{it-2} + \dots + \theta_q \epsilon_{it-q}$$

Autoregressive term (AR) Moving Average term (MA) The research was adopted in obtaining secondary data published and unpublished by the Ministry of Agriculture and Land Reclamation, Central Agency for Public Mobilization and Statistics, Central Department of Agricultural Sector, FAO. Some researches, theses, studies and scientific books were also used

RESEARCH RESULTS AND DISCUSSION

First: The relative importance of the value of the most important agricultural export crops from the total Egyptian agricultural exports: A review of Table 1 data shows that the orange crop ranked first in the total value of Egyptian agricultural exports during the period (2002 - 2018), amounting to about \$ 279.43 million, representing about 14.93% of the total value of agricultural exports. Cotton

came in the second with an average of about \$196.87 million, accounting for 10.52% of the total value of agricultural exports.

Rice came in the third place with an average of about 170.73 million dollars, or about 9.12%, followed by onions with an average of about \$ 125.62 million by about 6.71%, then potatoes with an average of about \$124.65 million or about It was followed by grapes with an average of about \$ 118.23 million, accounting for about 6.32% of the total value of agricultural exports during the study period. The average value of these crops amounted to about \$ 1,015 billion representing 54.27% of the total value of agricultural exports during this period.

Beans, strawberries, medicinal and aromatic plants and tomatoes came in the seventh to tenth ranks with relative importance of 3.31%, 2.16%, 1.7% and 1.2% of the total value of Egyptian agricultural exports respectively during the period (2002 – 2018).

Table 1: Relative importance of the value of the most important agricultural export crops from the total Egyptian agricultural exports during the period (2002 – 2018

No.	Name of crop	%
1	Orange	%14,93
2	Cotton	%10,52
3	the rice	%9,12
4	Onions	%6,71
5	potato	%6,66
6	Grapes	%6,32
7	Other crops	%45,73
	Total	%100

Source: Compiled from: Central Agency for Public Mobilization and Statistics, Bulletin of Foreign Trade, various issues. www.capmas.gov.eg

Due to the low relative importance of both potatoes such as vegetables and grapes as fruit crops in the total value of Egyptian agricultural exports, which called for their selection to discuss ways of developing the value of agricultural exports from them under globalization.

Second: Indicators of the efficiency of Egyptian agricultural exports of potatoes during the average period (2010-2018): This section deals with the results of measuring the competitiveness of the most important Egyptian agricultural exports represented by potatoes and grapes as one of the most important exports of vegetables and fruit crops by calculating the indicators of the efficiency of the Egyptian agricultural exports which include (market share index, market penetration index, competitive position index, geographic concentration index, or Gini Hershman, virtual advantage index) over the average period (2010-2018).

Market share index of Egyptian potato exports in the most important international markets

Data from table II shows that the market share of Egyptian potato exports in the total value of world potato exports ranged from a minimum of about 3.10% in 2010 to a maximum of about 5.87% in 2017 with an average of about 4,507% during that period. The market share of Egyptian potato

exports in international markets increased from about 3.10% in 2010 to about 4,584% in 2018, an increase of about 47.77% from 2010.

Market penetration index of the most important Egyptian agricultural exports of potatoes in the most important world markets

Data from table III shows a decrease in the rate of penetration of Egyptian potato exports to world markets, ranging from a minimum of 0.5% in United Russia and a maximum of about 11.24% in Lebanon. It appears that Lebanon is one of the most penetrated markets for Egyptian potato exports.

Table 2: Development of Market Share Index of Egyptian Agricultural Exports of Potatoes during the period (2010 – 2018)

Year	Potatoes
2010	3.102
2011	5.749
2012	5.462
2013	3.268
2014	5.506
2015	3.355
2016	3.667
2017	5.871
2018	4.584
Average	4.507

Source: Compiled and calculated from FAO
www.fao.org

Price index of Egyptian potato export price compared to competing markets

2.1.1. Data in table V shows that the price index of Egyptian potatoes is high compared to the competing world markets.

Table 3: Average Market Penetration Rate of Egyptian Potato Exports in Major world Markets During the Average Period (2010-2018)

Country	Quantity of Egyptian potato exports	State imports of the commodity	State production of the commodity	State exports of the commodity	Market penetration rate
Lebanon	38.963	88.4	391.9	133.7	11.24
Greece	48.573	141.9	828.5	19.4	5.11
Italy	61.204	618.3	1572.3	166.5	3.02
United Russia	158.579	539.9	31154.7	55	0.5
Germany	27.654	690.7	10960.2	1691.4	0.28

Source: Compiled and calculated from FAO www.fao.org

TABLE IV: Price Ratio Index among the Most Important Countries of pPotatoes Export Crops During the Average Period (2010-2018)

Greece	1.118
Lebanon	0.953
United Russia	0.864
Germany	0.84
Italy	0.726
Average	0.96

Source: Compiled and calculated from FAO
, www.fao.org

In Greece it reached 1.12%, while in other competing countries it decreased in 0.95%, the Russian Federation 0.86% and Germany. 84% and Italy 0.73%, which indicates the advantage of Egypt in terms of price competitiveness of the potato crop, due to lower export prices compared to the markets of rival countries except Greece.

Geographical Concentration Index (Gini Hirschman) for Egyptian Potato Exports

Table V shows the multiplicity of international markets for importing Egyptian potatoes, where there are several international markets for importing Egyptian potatoes, the most important of which are the Russian Federation, Italy, Greece, Lebanon, Germany, UAE, Kuwait, United Kingdom, Syria, Ukraine, Netherlands, Oman, Qatar, Indonesia, other countries. By studying the geographical distribution of the quantity and value of Egyptian potato exports during the average period (2010-2018), it was found that the Russian Federation ranked first in the import of Egyptian potatoes, where the average quantity of potatoes exported to it reached 158,579 thousand tons representing about 35.48% of the average total Egyptian potato exports, amounting to about 446.93 thousand tons with a value of about \$ 62,679 million, representing about 31.99% of the average value of Egyptian potato exports, which amounted to about \$ 195.95 million during the average period (2010-2018).

Italy was the second largest importer of Egyptian potatoes with 61.2 thousand tons, representing 13.7% of the average total Egyptian exports of potatoes with a value of 28.2 million dollars representing 14.4% of The average total value of Egyptian potato exports, followed by Greece, Lebanon, Germany, UAE, Kuwait, UK, and Syria at a rate of about 10.9%, 8.7%, 6.2%, 3.62%, 3.58%, 3.48% and 2.86% respectively of the total quantity of Egyptian potato exports during the period (2010-2018).

TABLE V: Geographical Distribution of Egyptian Potato Exports During the Average Period (2010-2018)

Country	Quantity of Egyptian potato exports	%	Coefficient of geographical concentration of quantity	The value of Egypt's potato exports	%	Coefficient of geographical concentration of value	Export price USD / ton
United Russia	158.579	35.48	0.126	62.679	31.99	0.102	395.3
Italy	61.204	13.69	0.019	28.193	14.39	0.021	460.6
Greece	48.573	10.87	0.012	21.899	11.18	0.012	450.8
Lebanon	38.963	8.72	0.008	16.946	8.65	0.007	434.9
Germany	27.654	6.19	0.004	13.469	6.87	0.005	487.1
UAE	16.159	3.62	0.001	7.98	4.07	0.002	493.8
Kuwait	15.978	3.58	0.001	8.448	4.31	0.002	528.7
United kingdom	15.561	3.48	0.001	8.582	4.38	0.002	551.5
Syria	12.778	2.86	0.001	6.112	3.12	0.001	478.3
Ukraine	8.802	1.97	0	3.103	1.58	0	352.5
Netherlands	6.763	1.51	0	2.855	1.46	0	422.1
Oman	5.625	1.26	0	2.695	1.38	0	479.1
Qatar	3.485	0.78	0	1.864	0.95	0	534.9
Indonesia	2.379	0.53	0	1.37	0.7	0	575.9
other countries	24.429	5.47	0.003	9.756	4.98	0.002	399.4
Total	446.93	100	0.42	195.95	100	0.4	352.5

Source: Compiled from: Central Agency for Public Mobilization and Statistics, Bulletin of International Trade, Miscellaneous Issues, www.capmas.gov.eg

It was also found that the geographical concentration of potato exports amounted to about 42%, while the geographical concentration of the value of potato exports was about 40% during the average period (2010-2018), indicating a decrease in the concentration of Egyptian potato exports in the world markets imported for Egyptian potatoes. The average export price of Egyptian potatoes among the different importing countries ranged from a minimum of about \$ 352.5 / ton to Ukraine and a maximum of about \$ 575.9 / ton to Indonesia.

The apparent comparative advantage index of Egyptian potato exports in the most important international markets

Data from table VI shows that the index of apparent comparative advantage of Egyptian potato exports ranged from a minimum of about 11.32% in 2010 to a maximum of about 29.37% in 2008 with an average of about 20.09% during the average period (2010-2018). It was also found that the value of the apparent comparative advantage index of Egyptian potato exports has increased from the correct one, which means that Egypt enjoys a virtual comparative advantage in the export of potatoes during the period (2010-2018).

TABLE VI: Evolution of the Index of Comparative Advantage of Potato Exports during the Period (2010-2018)

Year	Potatoes
2010	22.53
2011	29.37
2012	17.5
2013	11.32
2014	24.03
2015	16.72
2016	17.86
2017	28.28
2018	23.6
Average	20.46

Source: Compiled and calculated from FAO
, www.fao.org

The instability index of Egyptian agricultural exports of potatoes

Data from table VII shows that the instability index of the quantity of Egyptian potato exports is characterized by apparent instability, ranging from a minimum of about 13.77% in 2008 and a maximum of about 52.0% in 2011, with an annual average of about 25.47 % During the period (2010-2018).

TABLE VII: The Evolution of the Instability Index for the Quantity of Egyptian Potatoes Exports during the period (2010-2018).

Year	Potatoes
2010	13.77
2011	35.89
2012	32.05
2013	52
2014	38.19
2015	22.88
2016	17.32
2017	25.34
2018	14.26
Average	25.47

Source: Compiled and calculated from
FAO , www.fao.org

Third: Standard Estimation of External Demand Functions for Potatoes in world Markets (2010-2018):

The standard estimation of the external demand functions of potatoes and grapes in the international markets during the period (2002-2018) to identify the most influential variables in the demand for these Egyptian agricultural exports in the world markets, after the use of different mathematical images of the functions are linear and semi-logarithmic and double logarithmic,

where the best of these images were selected based on the t-values of the regression coefficients for the independent variables contained in the functions as well as the F and R² tests. The following is a review of the results of the standard estimation of external demand functions on the most important Egyptian agricultural exports in the international markets during the period (2010-2018).

Standardization of External Demand for Egyptian Potato Exports in world Markets

The estimation of the demand function of the Egyptian potatoes exports in the world markets during the period (2002-2018) shows that the regression coefficients are consistent with the statistical and economic logic in terms of the signal, and the regression coefficients were significant at the level of (0.01). In international markets (Y) depends on the total domestic production of potatoes per thousand tons (X₁), and it was found that these variables account for about 39.7% of the changes in the quantity of Egyptian exports of potatoes exported to international markets.

$$Y^{\wedge} = 82.574 + 0.085 X_1$$

(3.40)**

F=11.5 R² =0.397 D.W=2.0

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

The linear model showed that there is a direct relationship between the quantity of Egyptian potato exports (Y) and the total domestic production of potatoes per thousand tons (X₁), where it was found that an increase of one unit the total domestic production of potato leads to increase the quantity of Egyptian potato export by about 0.085 thousand tons.

Fourth: The Future of Egyptian Agricultural Exports of Potatoes

This section discusses the future prospects of Egyptian agricultural exports and the value of agricultural exports of potato crop in Egypt until 2024. Three prediction models were used: Single Asian Smoothing Model, Double Asian Smoothing Model (Brown Single-Teacher Method), and Holt Teacher Model. The preference of the model is based on the signature of the actual data in a graph to see if the data is static, ie random, meaning that it does not include a trend. In this case, the single Asian smooth smoothing model is best suited for forecasting, whereas if the data after its signature includes a trend (up or down) in this case Both the single-parameter Braun method and the teacher-specific Holt method model's efficiency to predict depending on the lowest RMSE value because it is the best criterion for estimation (nonlinear estimation by OLS).

TABLE X: The trade-off between Asian smoothing models used in the prediction of selected models

Item	Root Mean Square Error (RMSE)			Model
	Single	Brawn	Holt	
Value of potatoes exports	56.2	47.0	46.8	Holt

Source: Compiled from: Central Agency for Public Mobilization and Statistics, Bulletin of Foreign Trade, various issues. www.capmas.gov.eg

The following section shows the future projections of the value of Egyptian agricultural exports of potatoes up to 2022 through the trade-off between the exponential smoothing models mentioned

above. The study of the results of the prediction of the selected models until 2024 shows the preference of the teachers' Holt method. It is expected that the value of agricultural exports of potato crop will reach about 277.7 million dollars in 2024, an increase of about 77.4% compared to 2018. The prediction of the value of grape exports is expected to reach about \$ 319.4 million in 2024, an increase of 52.7% over that of 2018.

TABLE VIII: Future Outlook for the Value of Major Agricultural Exports of Potatoes in Million Dollars to 2024 Using Asian Smoothing Models

Variable	2020	2021	2022	2023	2024
Value of potatoes exports	244.7	253	261.2	269.5	277.7

Source: Calculated from the results of the analysis of data table I, table (13)

Fifth: Means of developing Egyptian agricultural exports in the light of globalization:

This section includes some ways to develop Egyptian agricultural exports in the context of globalization through the use of some studies and research that have been interested in this area, and some ways that may have a positive impact on the development of Egyptian agricultural exports to the global market can be developed as follows:

- Take a number of encouraging measures to increase Egyptian exports, which are represented in legislation and institutional measures that support the business climate in general, such as reviewing the legislation regulating the import and export law and regulations, and simplifying export and import procedures.
- Studying global demand trends to identify promising and future export sectors.
- Prepare training programs for Egyptian exporters on the concepts of e-commerce and e-marketing in accordance with the best standards and specifications to ensure compliance with the requirements and requirements of importing countries.
- Taking advantage of the comparative and competitive advantages enjoyed by Egypt in many agricultural crops, especially horticultural crops of vegetables and fruits and non-traditional agricultural crops such as medicinal and aromatic plants and cut flowers.
- Assisting small and medium-sized farmers in aggregating agricultural exploitation and following good agricultural practices throughout the production stages in order to meet the European and foreign export conditions and specifications (Euro Gap - Global Gap).
- Taking advantage of the foreign, regional and Arab agreements in which Egypt participates (WTO, GAFTA, COMESA, EU), in addition to bilateral agreements and protocols between Egypt and other countries such as Russia and China.
- Establishing a specialized center to examine Egyptian exports accredited by international accreditation bodies.
- The application of an intelligent market information system that provides all the data on the market, especially importers around the world and gives an order to the credible importers in dealing.
- Adoption of environmental standards in the field of agricultural, food and export industries, which is known as the model (ISO19000), which requires the use of chemical fertilizers and pesticides and the expansion of the use of biological control.
- Meet the quality requirements as one of the most important elements and build the competitiveness of the Egyptian agriculture and industry to face the challenges faced by the

Egyptian product in the local or international markets, especially in light of the openness of the markets and the competition witnessed to satisfy the consumer and provide its requirements and needs.

TABLE IX: Variables of the External Demand of Egyptian Potatoes in the world Markets during the Period (2002-2018)

Year	Export quantity 10 ³ ton	Local production 10 ³ ton	Local consumption 10 ³ ton	Egyptian price export USD/ton	Exported quantity from Netherlands 10 ³ ton	Exported quantity from France 10 ³ ton	Price export of Netherlands USD/ton	Price export of France USD/ton	Exchange rate LE/USD
2002	156	1765	1674	170	1757	1111	188	190	3.472
2003	185	1903	1752	159	1893	1059	221	234	3.973
2004	229	1985	1811	185	1870	1456	229	240	4.5
2005	296	2039	1812	148	1796	1430	285	300	5.851
2006	380	2547	2189	176	1507	1492	237	213	6.196
2007	390	3167	2848	198	1642	1829	352	268	5.779
2008	366	2313	4002	177	1579	1911	466	334	5.733
2009	382	2760	2439	276	1473	1936	453	282	5.635
2020	414	3567	3282	474	1109	2040	595	233	5.433
2011	245	3659	3503	681	1854	2289	417	265	5.545
2012	272	3634	3387	434	2089	2004	507	345	5.622
2013	637	4338	3826	393	1827	1985	407	260	5.933
2014	271	4758	4367	425	2064	1922	509	397	6.056
2015	352	4265	4125	479	2090	1902	431	273	6.87
2016	557	4611	4096	477	1867	1979	380	235	7.078
2017	618	4955	4495	363	1993	1851	404	326	7.726
2018	439	4113	3901	357	1820	2021	436	289	10.187
Average	364	3316	3148	328	1778	1777	383	276	5.976

Source: Compiled from:

- 1- Central Agency for Public Mobilization and Statistics website: www.capmas.gov.eg
2. Website of the Foreign Trade Map www.trademap.org

References

1. Abbas, Abu Deif (2008), Economic Study for the Development of Agricultural Exports to Arab Countries, Master Thesis, Department of Agricultural Economics, Faculty of Agriculture, Al-Azhar University..
2. Abdel-Latif, Hanaa (2007). Some Determinants of Egyptian Potato Demand in its Most Important International Markets, Egyptian Journal of Agricultural Economics, Volume XVII, Number 2, June.

3. Shehata, Gaber (2013), *Contemporary Trends in Agricultural Marketing and Total Quality Management*, Dar Al Wafaa for Printing and Publishing, Alexandria, Egypt.
4. Shehata, Gaber (1998). *The Importance of Products Quality*, CIHEAM, Mediterranean Agronomic Institute of Zaragoza, Spain, November 1998.
5. Shehata, Gaber (2009). *An Economic Study of Egyptian Foreign Agricultural Trade and its Relationship with European Union*, 2nd International Economic Conference, Kaposvar University, Kaposvar, Hungary, 2-3 April 2009.
6. Elgabry, Amal (2018). *The Future of Egyptian Agricultural Exports and Means of Development in the Context of Globalization*, Ph.D. Thesis, Department of Economics and Agribusiness Management, Faculty of Agriculture, Alexandria University.
7. Mohamed, Abdel-Wakil and. Hamed Amer (2009). *Estimating the Demand Functions of Egyptian Potato Exports to the EU Using the Optimal Demand Model*, the Egyptian Journal of Agricultural Economics, Volume 19, Issue 4, December.
8. Ministry of Agriculture and Land Reclamation. Economic Affairs Sector, Agricultural Statistical Bulletin.

Websites:

1. FAO website www.fao.org
2. Trade Map website www.trademap.org
3. Central Agency for Public Mobilization and Statistics Website www.capmas.gov.eg