Journal of American Science

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MARSLAND PRESS
Multidisciplinary Academic Journal Publisher

The Current Situation of Egyptian Potatoes Exports in the shadow of Covid 19 Pandemic

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Abstract: The potato crop is considered one of the most important strategic vegetable crops in Egypt, as it is one of the food and industrial crops on which some food industries are based, and the results showed that the quantities of the potato crop decreased in Egypt, where the exported amount decreased from 808.2 thousand tons in 2017 to 561.4 thousand tons in 2020 , It represents 30% of the amount issued in 2017, this is reflected in the balance of payments and the availability of hard currency, due to the arrogant appearance of covid 19, and the potato crop ranked first in the area of the vegetable crops with about 436.6 thousand acres, representing about 22.7%, and the results showed that the area of the potato crop is increasing with a statistically moral rate of 15.45 thousand acres, It represents 4.07% of its average during the search period, it was also found that the average export power of the potato crop has reached it towards 11.57% of the average amount of production, and the results of the instability factor indicate that the value of exports was more stable than the amount of exports and the export price of the potato crop, as it reached about 6.4, 9.3, 19.8, respectively, it turned out from the research that the Netherlands ranked first in global potato exports with a value of 847.7 million dollars, representing 18.7%, while France is one of the most important countries competing for Egypt and exporting the potato crop, as it exports approximately 2.1 million tons, representing about 16.6 %, And the results indicate that Egypt has a high virtual relative advantage for the potato crop, as the general average of the relative feature of the period reached about 18.8. The results of the gravitational model to the statistical morale indicate the positive effect of the average per capita share of those countries ($x1^{--}$) in increasing the quantities exported of potatoes by about 0.12%, and the statistical moral of the positive effect of the average per capita share in Egypt ($x2^{--}$) in increasing the quantities exported of potatoes by about 0.15%, as well as the statistical moral for the positive effect of the (D) in increasing the quantities exported of potatoes by about 0.22%. The search is recommended:1- Establishing logistical and export centers for potatoes in the most important governorates producing them to encourage farmers to increase the cultivated areas and provide the necessary quantities for exporters (Beheira, New Valley, Menoufia, Nubaria and Minya). 2- In view of the comparative advantage of the potato, the work of the Egyptian exports, the work to encourage producers and exporters with investment incentives that enable them to open new markets is considered to be important to increase exports of potatoes.3- Attention to contractual crops for export and expansion in the required items globally.
[Kamel Salah El-Din, Yomna Shehata Mostafa and Mohamed Ali A. ElShahed**. The Current Situation of Egyptian Potatoes Exports in the shadow of Covid 19 Pandemic.** *J Am Sci* 2022;18(6):42-58]. ISSN 1545-1003 (print); ISSN 2375-7264 (online). http://www.jofamericanscience.org. 6. doi:10.7537/marsjas180622.06.

Keywords: Area and production of potato crop, Revealed Comparative Advantage, The non Stability Coefficient. Gravity Model.

Introduction:

The potato crop is considered one of the strategic vegetable crops in Egypt, as it is one of the food and industrial crops on which some food industries are based. Egyptian, potatoes are considered one of the important export crops in terms of global demand, in addition to the possibility of cultivation throughout the year, where the cultivated area reached about 560.8 thousand acres, and a production of about 6.78 million tons, according to the statistics of 2020 distributed over the three summer, winter and nail savings, and the value of potato production reached about 9310.8 thousand pounds, representing about 28.6%, 3.97%, 2.14%, respectively, respectively From the value of the production of both vegetables, plant production and agricultural production, which amounted to about 32.51 million pounds, 2343.25, 435.83 million pounds in a row during the period (2015-2019), potatoes are considered a vegetable crop of high nutritional value as they are a major source of energy for many poor people in the world, and the body

provides iron, sodium, potassium and some rare elements such as copper and manganese, as it contains eleven amino acids, and contains a mixture of vitamin C, B and antioxidants The fibres, as it decreases, decreases fat, as it is one of the important export goods on which the Egyptian economy depends.

Research problem :

The search problem is the decrease in the quantities issued by the potato crop in Egypt, as the exported amount decreased from 808.2 thousand tons in 2017 to about 561.4 thousand tons in 2020, by 30% of the exporting amount in 2017, which is reflected in the balance of payments and the availability of hard currency, This is with the spread of Virus covid 19 in the current period.

Search objectives:

This research aims to identify the most important economic indicators of potatoes in Egypt, which is represented in each of the space and production of the potato crop, the amount and value of exports, and the geographical distribution of it, in addition to indicators of the competitiveness of Egyptian potatoes in the global markets, and the determinants of external demand using the gravitational model for the potato crop.

Research method and data sources:

The research relied on the use of methods of descriptive and quantitative analysis, where the simple slope equations were used in the written image to estimate change rates, relative importance, and estimate some of the competitive indicators, estimating instability laboratories, geographic concentration factories, the apparent relative advantage, relative price, in addition to appreciation Gravity Model

The research was based on secondary data from the Economic Affairs Sector at the Ministry of Agriculture, the data of the Agile and Agriculture Organization F.A, O and the United Nations, in addition to scientific research and studies related to the subject of research.

Analytical framework:

The research in the analysis of the competitive conditions depended on a set of criteria used in this field, which is as follows-

1-**Export Force**:

Export strength measures the percentage of a state exports of some commodity attributed to the local production of this state of the same commodity and can be calculated through the following equation

E**Fu**=X**ij**/Q**ij**x100

Where: (E_{FU}) represents the export force of the state (F) of the commodity (U) in a market (XIG), (QIJ) exports and production of the state (I) of the commodity (J) and the height of this percentage indicates the increasing percentage of exports directed to the production of this commodity.

2-**Instability laboratories**:

Stability factor (or instability) use exports to measure annual fluctuations in the amount, value or price of export commodities, and there are several ways to measure the degree of instability of exports, the most famous of which is the average percentage of percentage of deviations, and it should be noted that, according to these The method is more stable exports whenever the value of the laboratory approaches zero, as this can be calculated for the total value of the total or agricultural exports of the state, and that the degree of instability of exports return depends in the first place on the extent of the main commodities contributing to the total value of exports, meaning that the more it increases The percentage of the commodity contribution to the total value of exports, the higher the degree of its impact on stability or instability, the total value of exports, and it is calculated from the following equation:

$S.C=(Y_I - \hat{Y}_I) /(\hat{Y}_I)*100$

Where: S.C: Y_I: The actual value of the variable in the year (i) $\hat{y}_I$: The estimated value of the variable in the year (i).

3-**Geographical and commodity concentration**:

Michealy, 1977 'explained that the degree of exports concentration can be measured using a quantum scale, through two types of concentration transactions, the first type is' Geographic Concentration Coefficient', which measures the degree of concentration in state exports in terms of The number of countries that the state deals with is exporting. The second type is 'Community Coefficient' commodity laborator, he research concluded that if the value of the concentration factor exceeds 40%, this indicates the geographical concentration (or commodity) of exports, through a number of applications on the exports of some countries, and it should be noted that the degree of exports are concentrated, most of which are raw goods in developing countries higher than The degree of the concentration of imports, unlike industrial countries, which leads to fluctuations in the value of exports to developing countries, and this results in negative effects on the economies of those countries through their impact on the exchange rates of foreign trade.

The geographical concentration is calculated from the following equation:

$C_{IX} = 100 \sqrt{\Sigma(XSJ / Xi)^2} \sqrt{\Sigma(XSJ / Xi)^2}$

C_{IX} =The geographical focus coefficient of the amount of exports of the crop is under study.

Xsj= the amount of Egyptian exports from the crop into the study to a specific market.

X_I= The total amount of Egyptian exports of the crop is under study.

4- **Relative feature:**

The relative advantage means the extent that it provides advantages in the country that helps it to produce certain goods, such as natural conditions, climatic, primary resources or cheap labor force, but these advantages may not help them to compete in foreign markets and this may be due to low quality, high cost or lack of conformity to specifications The standard required by foreign markets. It is common to use the 'cost of local resources' standard to measure the relative advantages of the products or groups of products or different sectors, but relying on the cost of local resources costs to identify the relative advantages is shrouded in some shortcomings, in terms of the fact that the cost of local resources is not the basis alone in determining the relative advantages of various products, in addition to the variation of this standard of the same product and in the same period. Hence, the manifestations of exports can be resorted to as an indicator of relative benefits, as long as the performance of exports of a commodity or a specific commodity group for a country in the global market compared to the performance of the rest of this country's exports in the global market is very close to the concept of relative advantages.

(Plusa, 1965) presented the criterion of 'Revealed Comparative' Advantage (RCA), which he suggested as one of the competitive indicators of the exporting goods of global markets, and the apparent relative feature is measured by dividing the value of exports to a country of a specific product in relation to the value of the total exports of this country On the value of global exports of this product in relation to the total value of global commodity exports. The state has a virtual relative advantage in a specific activity if the value of the relative feature index is greater than the correct one, and vice versa does not have a relative advantage if the value of the relative feature index is less than the correct one.

$$RCA = \frac{XijXtj}{XitXit} / \frac{XwjXwj}{XwtXwt}$$

Where: RCA expresses the apparent relative feature index, X_{IJ}, the value of the exports in the country J, Xit, Value. The total exports of the state J, X_{WJ} the value of the global exports of the commodity I, X_{WT} the value of the global total exports

5- **Relative Price Index**:

The state's competitive center in the production of a commodity expresses the percentage of state production from this commodity to the amount of its global production, while the state's competitive center expresses in exporting a commodity to the percentage of the amount of exports from this commodity to global exports and the state's competitor is determined by the export price of a commodity from During the relative price, the more the relative price of a commodity within a country is less than 100, this indicates the increase in the strength of the competitive center of the commodity exports from this country in the face of exports with the commodity in the competing country, but if the value of the relative price is more than 100, the more this indicates the weakness of the center The competitiveness of the state in the face of the other state competing with regard to the exports of the commodity and is calculated from the following equation: $P.C= P_E / P_C$

Where: P.C: Price competitive coefficient. PE: The average export price of the country (E).

PC: The average export price for the same commodity for the competing country (C).

6- Gravity Model:

The Model Gravity is dependent on the use of the slope of CT scans and temporal chains and the application of the spatial analysis method 'Analysis Spatial' where the method explains that it has the occurrence of any economic or political changes in a specific country that affects subordination to other countries adjacent to it and is called the spatial self - association. The gravitational model is mainly dependent on the law of "Isaac Newton" in 1687 AD, which states that the force of gravity (F) between two bodies is appropriate to the outcome of its blocks (M2. M1) and is reflected with the square of the distance between their centers (D2) and then "Jean Tinbarn It is applied in economics to become as follows:

Newton $F = G M_1 M_2 / D^2$ (1)

$Y_{ij} = G M_i M_j / Dist_{ij}$ (2)

Then the equation (2) was formulated to become a liquid equation in the following image:

$Y_{ij} = B0\ GDPi^{B1}\ GDP^{B2}\ Diatij^{-B3}$ (3)

And by taking Logarithm, both parties become written in the equations in the form of a Logaretian function as follows:

$Yij = B0 + B1\ Ln\ Pc\ GDPi + B2\ Ln\ GDPj - B3\ Ln\ Distij + eij$ (4)

Whereas: GDPI * GDPJ, the geographical distance between the two countries, Distij Random error Eij and this equation is called (4) with a basic gravitational model (Basic Gravity Model). It was called a modified gravitational model. 'Augmented Gravity Model' (AGM).

Pc GDPi + B2 Pc GDPj – B3 Ln Distij + eij (5) Ln Yij = B0 + B1 Ln

The model application is subject to a basic condition, which is not to exceed(S). scans T(4)

The gravitational form was used in the two with the basic, modified) in the search. When the basic model was limited to the following data: the GDP of Egypt (as a source of export), the GDP of the brooms of the selected countries (as imported countries), and the geographical distance between the capitals of those countries and Egypt. When estimating the modified model, the data for the pink share was used from the gross domestic product in Egypt, as well as the per capita share of the gross domestic product in the group of countries that are selected in addition to the geographical distance (D_{ij}.) The variable takes values (1, zero).

Results and Discussion:

1- **The relative importance of the potato crop space during the period (2016-2020):**

Table data (1) indicates that the potato crop ranked first with about 436.6 thousand feddan representing about 22.7%, while tomato crop ranked second with about 408,000 feddan, representing 21.3%, followed by the third to sixth, the area of watermelon crops, eggplant, dry beans and peppers about 162.4, 98.1, 97.7, 85.3 thousand feddan, representing about 8.47%, 5.12%, 5.09%, 4.45%, respectively, from the total area of the vegetables in the Republic, which is about 1918.5 thousand feddan, and the amount of potato production reached about 5180 thousand tons, representing about 25.6% of the total Republic production, the amount of tomato crop production reached about 6815.5 thousand tons, representing about 33.7%, and it was found that the amount of watering of the watermelon crop, eggplant, dry beans and peppers reached about 95.88, 1190.5, 689.8,103.8 thousand tons, representing about 0.47%, 5.89%, 0.51%, 3.4% from The total production of the Republic, which is around 20197 thousand tons during the research period.

2- **The relative importance of the space of potato varieties in Egypt:**

It is clear from the table (2), which indicates the relative importance of the area of imported potatoes during the period (2016-2020), as the Sponta class ranked first with about 88.57 thousand feddan, representing about 34.8%, while Diamont ranked second with about 51.12 thousand feddan, representing 20.08 %Follows other varieties, the third rank with about 35.09 thousand feddan, representing about 13.78%, then Kara ranked fourth with about 22.55 thousand

Table (1): The relative importance of the space of the potato crop in the Arab Republic of Egypt during the period (2016-2020).

Crop	Area thousand feddan	%	Productive of tons /feddan	Production thousand tons	%
potato	**436.6**	**22.76**	**11.25**	**5180.1**	**25.65**
tomato	**408.11**	**21.27**	**16.26**	**6818.5**	**33.76**
Squash	**47.82**	**2.49**	**9.45**	**1218.3**	**6.03**
Green Beans	**43.6**	**2.27**	**4.26**	**174.01**	**0.86**
Dry Beans	**97.7**	**5.09**	**1.13**	**103.81**	**0.51**
Sweet-Potatoes	**32.19**	**1.68**	**13.76**	**452.12**	**2.24**
Perry	**25.68**	**1.34**	**13.93**	**423.64**	**2.1**
Cucumber	**41.92**	**2.19**	**11.28**	**392.12**	**1.94**
Eggplant	**98.13**	**5.12**	**14.41**	**1190.5**	**5.89**
Pepper	**85.29**	**4.45**	**9.57**	**689.82**	**3.42**
Water - Melon(G.1)	**73.14**	**3.81**	**14.12**	**1014.8**	**5.02**
Artichoke	**32.77**	**1.71**	**7.75**	**280.25**	**1.39**

Seeds Water-Melon	**162.45**	**8.47**	**0.64**	**95.88**	**0.47**
Other crops	**333.1**	**17.36**	**-**	**2163.5**	**10.71**
Total vegetables	**1918.5**	**100**	**-**	**20197**	**100**

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Agricultural Economy Bulletin, various numbers.

Feddan, representing about 8.8%, followed by a valley Rosetta class ranked fifth with about 11.11 thousand feddan, representing about 4.36%, while the Nicolas class ranked sixth with 8.27 thousand acres, representing 3.25%, followed by an Esponta (local fracture) class in the seventh place with about 8.17 thousand acres, representing about 3.2%, then followed by the rest of the varieties of Bern, Darraja, Ashriajatiatika, Cilane and Flura, about 7.49, 6.3, 5.5 , 5.0, 4.9, 3.4 thousand feddan represented 2.9%, 2.5%, 2.1%, 1.9%, 1.9%, 1.3%, respectively, from the area of potato varieties in the republic of 254.6 thousand feddan, while for the average academic productivity it occupied the varieties And Kara Walidi Rosetta and Nikola from the first to the fifth with about 12.6, 11.8, 11.6, 11.5, 11.05 tons/feddan, respectively.

3- The geographical distribution of the potato crop in the governorates of Egypt:

By induction of schedule (3), which shows the geographical distribution of the area of the potato crop in the governorates of the Republic during the period (2016-2020), it was found that the Beheira Governorate ranked first with about 67.81 thousand feddan, representing about 15.5%, followed by the New Valley Governorate with about 47.41 thousand feddan, representing

Table (2): The relative importance of the space and productivity of winter potatoes in Egypt during the period (2016-2020).

	varieties	Area thousand feddan	%	Production thousand tons	%	Productivity of tons /feddan
Imported	**Espont**	**88.57**	**34.79**	**1128.57**	**37**	**12.66**
	Diamont	**51.12**	**20.08**	**672.65**	**22.05**	**11.81**
	Lady Rozeta	**11.11**	**4.36**	**126.36**	**4.14**	**11.5**
	Kara	**22.55**	**8.86**	**260.59**	**8.54**	**11.65**
	Draga	**6.34**	**2.49**	**67.14**	**2.2**	**10.69**
	Bern	**7.49**	**2.94**	**75.38**	**2.47**	**9.98**
	Agria	**5.52**	**2.17**	**63.09**	**2.07**	**10.78**
	Floura	**3.42**	**1.34**	**36.25**	**1.19**	**10.55**
	Nekola	**8.27**	**3.25**	**93.33**	**3.06**	**11.05**
	Cilan	**4.93**	**1.94**	**53.01**	**1.74**	**10.46**
	Berma	**5**	**1.96**	**50.42**	**1.65**	**10.04**
	Others	**35.09**	**13.78**	**377.65**	**12.38**	**10.64**
	Total	**246.46**	**96.79**	**2974.64**	**97.53**	**11.98**
Local	**Espont**	**8.17**	**3.21**	**75.42**	**2.47**	**9.25**
Total Republic		**254.63**	**100**	**3050.05**	**100**	**11.89**

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Agricultural Economy Bulletin, various numbers.

about 10.86%, And they follow them from the third to sixth place, Menoufia, Dakahlia, Nubaria and Minya, with about 45.6, 45.4, 41.50, 40.4 thousand feddan, representing about 10.4%, 10.4%, 9.5%, 9.3%, respectively, from the total area of the potato crop in the governorates of the Republic, amounting to 436.6 thousand Feddan.

4- **The development of space, productivity and production of the potato crop in Egypt during the period (2006-2020)**

A- **The area of the potato crop**:

Table data (4) indicates that the area of the potato crop reached the lowest of which amounted to 220.3 thousand feddan in 2006, while the top reached 560.8 thousand feddan in 2020, with an average of 379.5 thousand feddan and the deviation of my standards 20.76 thousand feddan from its average during the research period.

By appreciating the general trend equation (5) schedule (5) it was found that the area of the potato crop is increasing with a statistically moral rate of 15.45 thousand feddan, represents.

B- **Feddan productivity**:

It was found from Table (4) data that the productivity of the feddan of the potato crop reached 10.4 tons/feddan in 2006, while the top reached 12.3 tons/acres in 2019, with an average of 11.3 tons/acres and the deviation of my standard 0.15 tons of feddan from its average during The research period.

The general trend equation (5) Table (5) shows that the productivity of the feddan of the potato crop is increasing at a statistically moral rate of 0.11 tons, representing 0.98% of its average during the research period, and the value of the R^2, which amounts to 0.78 indicates that the time factor is responsible for 78% of the changes in the productivity of feddan from the potato crop The rest is 22% due to other factors, and the value of 48.5 indicates the morale of the model used at a morale 0.1.

C- **Total production**:

Table data (4) show that the total production of the potato crop has below 2312.8 thousand tons in 2006, while the above reached 6785.8 thousand tons in 2020, with an average of 4362.8 thousand tons and the deviation of 273.7 thousand tons from an average during the research period.

By installing the features of the general trend equation, schedule (5) it is clear that the total production of the potato crop increases with a statistically moral rate of 205.17 thousand tons, represents 7.7% of its average during the search period, and the value of the R2 of 0.75 indicates that the time factor is responsible for 75% of the changes in an area Potatoes and the rest of 25% are due to other factors, and the value of 38.8 indicates the morale of the model used at a morale 0.1.

Table (3): The relative importance of the space and production of the potato crop in the governorates of Egypt during the period (2016-2020).

Governorates	Area thousand feddan	%	Productivity of tons /feddan	Production thousand tons	%
Alexandria	24.50	5.61	13.42	329.51	6.36
Behera	67.81	15.53	11.27	764.29	14.75
Gharbia	25.69	5.88	12.29	318.22	6.14
Kafr-El Sheikh	1.34	0.31	14.81	19.98	0.39
Dakahlia	45.40	10.40	11.79	539.71	10.42
Damietta	11.00	2.52	9.22	102.21	1.97
Sharkia	9.80	2.25	14.17	139.02	2.68
Ismailia	17.54	4.02	15.09	269.56	5.20
Menoufia	45.60	10.44	10.17	464.57	8.97
Qalyoubia	10.23	2.34	14.55	148.84	2.87
governorates Remainder	0.20	0.05	9.92	2.02	0.04
Lower Egypt	259.12	59.35	11.92	3097.92	59.80
Giza	19.87	4.55	11.03	219.70	4.24
Beni Suef	13.48	3.09	11.94	160.99	3.11
Menia	40.43	9.26	9.04	352.95	6.81
Middle Egypt	74.00	16.95	9.51	710.70	13.72
Assuit	16.23	3.72	12.12	167.92	3.24
Suhag	2.38	0.55	15.89	38.69	0.75
governorates Remainder	0.66	0.15	9.11	10.88	0.21
Upper Egypt	4.74	1.08	14.97	71.03	1.37
Inside the valley	345.00	79.02	11.48	3964.34	76.53
New Valley	47.41	10.86	15.46	740.64	14.30
Matruh	2.47	0.56	13.28	32.70	0.63
Noubaria	41.50	9.51	10.59	440.66	8.51

governorates Remainder	**0.22**	**0.05**	**5.58**	**2.20**	**0.04**
Outside the valley	**91.60**	**20.98**	**13.16**	**1215.78**	**23.47**
Total Republic	**436.60**	**100**	**11.83**	**5180.12**	**100**

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Agricultural Economy Bulletin, various numbers.

4.07% of its average during the search period, and the value of the R2, which amounts to 0.73 indicates that the time factor is responsible for 73% of the changes in the area of the potato crop The rest is 27% due to other factors, and the value of the 36.78 indicates the morale of the model used at a morale 0.01.

Table (4): The development of space, productivity and production of the potato crop in Egypt during the period (2006-2020).

Years	Area thousand feddan	Productivity tons /feddan	Production thousand tons
2006	**220.3**	**10.4**	**2312.8**
2007	**257**	**10.7**	**2760.4**
2008	**327.5**	**10.8**	**3567**
2009	**329.7**	**11.1**	**4338.4**
2010	**334.6**	**10.9**	**3634.3**
2011	**390.8**	**11.1**	**4338.4**
2012	**421.8**	**11.3**	**4758**
2013	**381.4**	**11.2**	**4265.2**
2014	**409.5**	**11.3**	**4611.1**
2015	**437.4**	**11.3**	**4955.4**
2016	**376.6**	**10.9**	**4113.4**
2017	**414.9**	**11.7**	**4841**
2018	**408.1**	**12.2**	**4960.1**
2019	**422.6**	**12.3**	**5200.2**
2020	**560.8**	**12.1**	**6785.8**
Minimum	**220.3**	**10.4**	**2312.8**
Maximum	**560.8**	**12.3**	**6785.8**
Mean	**379.5**	**11.3**	**4362.8**
Standard Error	**20.76**	**0.15**	**273.7**

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Agricultural Economy Bulletin, various numbers.

Table (5): The general timeline equations for an area, productivity and production of the total potato crop in Egypt during the period (2006-2020).

Statement	The equation	T	R^2	average	% change rate	F
Total area (thousand feddan)	**$Y^{\wedge}$=255.88+15.45 X_i**	**6.06****	**0.74**	**379.5**	**4.07**	**36.8**
Productivity (tons/feddan)	**$Y^{\wedge}$=10.39+0.1117X_i**	**6.96****	**0.79**	**11.29**	**0.98**	**48.47**
Total production (thousand tons)	**Y^=2721.3+205.17Xi**	**6.23****	**0.75**	**4362.77**	**7.7**	**38.83**

Whereas : Y^ i= The estimated value of the dependent variable, (X_i) indicates the element of time as an independent variable where I (1, 2, 3, 4 . 15). R^2 =Determination Laboratory Change rate =B/Averagex100 ** Moral at 0.01, *morale at 0,05 level

Source: Collected and calculated from Table (5) data.

5-Development, value, price and instability factor for Egyptian exports of potatoes:

1- **The quantity of exports**:

Table data (6) indicates that the quantity of exports of the potato crop during the period (2006-2020), the lowest of which amounted to about 215 thousand tons in 2009, while the highest reached about 808.2 thousand tons in 2017, with an average of about 496.4 thousand tons And by deviating a

standard of 47.9 thousand tons from its average during the search period.

The general timetable equation (7) Table (7) shows that the amount of potato crop is increasing at an annual statistically moral rate of about 0.16 thousand tons, representing 0.003% of its average during the search period. The identification laboratory also reached about 0.46, which means that 46% of the changes in the amount of potatoes are due to the time of time and that 54% of these changes are due to other factors, and the value of F -11.21 indicates the morale of the model used.

2- **The value of exports**:

Table (6) indicates that the value of exports from the potato crop during the period (2006-2020) reached the minimum limit of about 65.3 million dollars in 2006, while the highest limit amounted to about 326.8 million dollars in 2014, with an average of about 192.2 million Dollars, and with a standard deviation of $ 18.5 million for an average during the search period.

The general timetable equation (7) Table (7) indicates that the value of the exports of the potato crop is increasing annually with a statistically moral rate of 0.04 million dollars, which represents 0.021% of its average during the research period, and the determination coefficient reached about 0.42, which means that 42% of the changes in the exporting quantity From potatoes, it is due to the time factor and that 58% of these changes are due to other factors, and the value of the 6.5 indicates the morale of the model used.

3- **Export price**:

It became clear from Table (6) data that the price of the export of the potato crop during the period (2006-2020), the minimum reached about 177.9 dollars/tons in 2006, while the highest limit reached about 676.3 dollars/tons in 2009, with an average About $ 401.9/tons, with a deviation of my standard, amounted to $ 29.7/tons at an average during the research period.

The general timeline equation (7) schedule (7) shows that the price of ton exports from the potato crop decreases annually at a statistically non -moral rate of $ 0.0017, representing 0.004% of its average during the research period.

4- **Export strength**:

It was found that the average export force of the potato crop has reached it towards11.57% of the average amount of production of about 4362.8 thousand tons during the period (2006-2020) and ranges between a minimum of about 8.27% in 2020, a higher limit of about 15.8% 2006 year as shown in Table (6).

5- **The exchange rate**:

Table (6) indicates that the exchange rate during the period (2006-2020) reached the minimum of about 5.45 pounds in 2008, while the highest limit reached about 18.35 pounds in 2017, with an average of about 9.3 pounds, and with a deviation of my standard of 1.3 EGP for average during the research period.

The general timetable equation indicated schedule (7) that the exchange rate is increasing annually by a statistically significant amount of about 0.74 pounds, and at a change rate of about 8.05% of its average, which is 9.3 pounds, and the specification laboratory reached about 0.70, which means that 70% of the changes are at the price The exchange is due to the time factor and that 30% of these changes are due to other factors, and the 31.3 value indicates the morale of the model used.

6- **The equivalent price in the pound**:

By extrapolating a table (6), which displays the value of exports from the potato crop at the price equivalent of the pound during the search period (2006-2020), that it reached the minimum of about 1021 pounds in 2006, while the highest limit reached about 6508.1 pounds in 2019, With an average of about 3584.1 pounds, and with a deviation of my standard of 435.7 from an average during the research period.

The general timetable equation shows Table (7) that the equivalent price of the potato crop exports is increasing annually with a statistically moral rate of 0.0023, and the annual change rate of about 6.47% of its average during the research period, and the specification laboratory reached about 0.76, which means that 76% of the changes In the amount of potatoes exported due to the time factor and that 24% of these changes are due to other factors, and the value of 42.54 indicates the morale of the model used.

Potatoes exported from potatoes:

The estimates mentioned in Table (6) for the exported quantities showed that the years (2012, 2016, 2005) were more stable for the quantity exported than the potato crop where instability laboratories reached about 1.6, 4.4, 5, respectively. The average instability coefficient of the quantity issued by the potato crop reached about 9.3 during the period (2006-2020).

Instability factor for the value of exports of potatoes:

It was found from Table (6) that the years (2016, 2012, 2020) were more stable for the value of export from the potato crop, reaching 2.9, 4.3, 4.5, respectively, and the average instability laboratories reached 6.4 during the period of (2006-2020).

The instability coefficient of the export of the potato crop:

It became clear from Table (6) that the export price in the years (2020, 2019, 2011) was more stable for the potato crop, as it reached about 2, 4, 4.7, respectively, and the average instability coefficient reached about 19.8 During the period from (2006-2020), the results indicate that the instability factor for exports was more stable than the average amount of exports and the export price of the potato crop, as it reached about 6.4, 9.3, 19.8, respectively.

Table (6) Your development, value and price of Egyptian exports of potatoes and instability transactions during the period (2006-2020).

years	Quantity Exports thousand tons	value of exports Million dollars	Export price dollar/ ton	production (thousand tons)	Export strength %	exchange rate	EGP/ ton price	Instability factor For Quantity the of exports	Instability factor for the value of exports	Instability factor for export price
2006	**367.1**	**65.3**	**177.9**	**2312.8**	**15.87**	**5.74**	**1021.0**	**17.9**	**7.6**	**57.5**
2007	**389.6**	**108.0**	**277.2**	**2760.4**	**14.11**	**5.64**	**1563.4**	**15.4**	**7.2**	**33.6**
2008	**378.4**	**176.1**	**465.4**	**3567**	**10.61**	**5.45**	**2536.3**	**12.8**	**8.0**	**11.8**
2009	**215.0**	**145.4**	**676.3**	**4338.4**	**4.96**	**5.55**	**3753.3**	**5.0**	**7.1**	**63.0**
2010	**300.0**	**131.9**	**439.7**	**3634.3**	**8.25**	**5.68**	**2497.3**	**7.1**	**6.1**	**6.2**
2011	**637.4**	**250.7**	**393.2**	**4338.4**	**14.69**	**5.97**	**2347.7**	**13.4**	**7.9**	**4.7**
2012	**263.0**	**127.4**	**484.2**	**4758**	**5.53**	**6.14**	**2973.1**	**1.6**	**4.3**	**17.7**
2013	**428.0**	**205.9**	**481.1**	**4265.2**	**10.03**	**7.15**	**3439.7**	**7.6**	**6.9**	**17.0**
2014	**684.7**	**326.8**	**477.3**	**4611.1**	**14.85**	**7.09**	**3383.9**	**11.8**	**8.1**	**16.3**
2015	**595.3**	**231.7**	**389.2**	**4955.4**	**12.01**	**7.83**	**3047.2**	**9.5**	**6.8**	**4.9**
2016	**407.8**	**147.1**	**360.8**	**4113.4**	**9.91**	**8.88**	**3204.2**	**4.4**	**2.9**	**11.6**
2017	**808.2**	**272.1**	**336.7**	**4841**	**16.69**	**18.35**	**6179.0**	**10.9**	**6.8**	**17.3**
2018	**725.0**	**206.9**	**285.4**	**4960.1**	**14.62**	**17.79**	**5077.2**	**9.1**	**5.0**	**29.7**
2019	**685.0**	**266.2**	**388.5**	**5200.2**	**13.17**	**16.8**	**6508.1**	**7.8**	**6.1**	**4.0**
2020	**561.4**	**221.9**	**395.3**	**6785.8**	**8.27**	**15.8**	**6230.7**	**4.9**	**4.5**	**2.0**
Minimum	**215.0**	**65.3**	**177.9**	**2312.8**	**8.27**	**5.5**	**1021.0**	**1.6**	**2.9**	**2.0**
Maximum	**808.2**	**326.8**	**676.3**	**6785.8**	**15.87**	**18.4**	**6508.1**	**17.9**	**8.1**	**63.0**
Mean	**496.4**	**192.2**	**401.9**	**4362.8**	**11.57**	**9.3**	**3584.1**	**9.3**	**6.4**	**19.8**
Standard	**47.9**	**18.5**	**29.7**	**273.7**	**-**	**1.3**	**435.7**	**-**	**-**	**-**

Source: Group and calculated from the statistical database (FAOSTAT), Food and Agriculture Organization of the United Nations, (2006-2020).

Table (7): Equations for the general time direction of your development, value and price of exports for the potato crop in Egypt during the period (2006-2020).

Statement	The equation	T	R^2	average	% change rate	F
Quantity Exports (thousand tons)	$\hat{Y}=-0.128+0.016\ X_i$	**3.34****	**0.46**	**496.4**	**0.003**	**11.21**
value of exports Million dollars	$\hat{Y}=-0.194+0.04X_i$	**3.08****	**0.42**	**192.2**	**0.021**	**6.5**
Export price dollar/ ton	$\hat{Y}=8.69-0.0017Xi$	**-0.16**	**0.001**	**401.9**	**-0.004**	**0.025**
exchange rate	$\hat{Y}=1.016+0.074Xi$	**5.5****	**0.70**	**9.3**	**8.05**	**31.3**
EGP/ ton price	$\hat{Y}=-0.031+0.0023\ X_i$	**6.5****	**0.76**	**3584.1**	**6.47**	**42.54**

Whereas: $\hat{Y}$ i= The estimated value of the dependent variable, (X_i) indicates the element of time as an independent variable where I (1, 2, 3, 4 .. 15). R^2=Determination Laboratory Change rate=B/Average x100 ** Moral at 0.01, *morale at 0,05 level

Source: Collected and calculated from Table (6) data.

6-The relative importance of the amount and value of potato exports in the global markets:

A- **The quantity of potato exports in global markets**:

It turned out from Table (8) that France ranked first for the amount of international potato exports in an amount of about 2186.9 thousand tons, representing about 16.4% of the total amount of international potato exports, while the Netherlands ranked second with the amount of exports of about 1959.59 thousand tons, representing about 14.69% It is followed by the third to sixth place in the country of Germany, Belgium, Egypt, Canada, America, China in the amount of exports of about 1925.9, 1027.68, 637.4, 514.9, 514.8, 462.59 thousand tons, respectively, represented about 14.4%, 7.7%, 4.78%, 3.86%, 3.86%, 3.47%, respectively, as it was found that the state of Pakistan, India and Spain The Russian Federation came from seventh to the tenth rank with the amount of exports of about 479.9, 322.04, 289.54, 270.15 thousand tons, respectively, representing about 3.6%, 2.4%, 2.17%, 2.03%, respectively, and the amount of exports of the rest of the science countries reached about 2232 thousand tons It represents about 16.7 % of the average amount of exports of the world from potatoes, which amounted to about 13337.7 thousand tons during the period (2016-2020).

B- The value of Potato exports in global markets:

By extrapolating the results of a table (8) it turns out that the Netherlands ranked first for the value of international potato exports for the average period (2016-2020) with a value of 847.7 million dollars, representing 18.7%, while France ranked second with a value of 688.7 million dollars, representing 15.3%, in When Germany, China and Canada ranked third, fourth and fifth with values of 399.9 million dollars, 307.5 million dollars, 253.8 million dollars, representing 8.9%, 6.8%, 5.6%, respectively, and the United States and Egypt came in the sixth and seventh place with a value of 244.1 million dollars , 24.8 million dollars, representing 5.4%, respectively. Then the rest of the world's ranks from the eighth to the sixteent %, Israel 67 million dollars represents 1.5%, Denmark 61.7 million dollars represented by 1.4%, Italy 56.7 million dollars representing 1.3%, Belarus 54.7 million dollars represents 1.2%, the Russian Federation 33.4 million dollars represents 0.7%, the rest of the world is 590.5 million dollars represented by 13.1%, from the average global exports value of 4509.3 million dollars during the research period.

7-Geographical concentration of Egyptian exports of potatoes:

The geographical distribution data of the potato crop, shown in the table (9) indicates that the total number of Egypt's exports of that crop amounted to about 637.4 million tons, estimated at 222.9 million dollars during the period (2016-2020). Russia is considered one of the most important countries importing potatoes, as it imported approximately 218.2 thousand tons, at a value of about 70.8 million dollars, the average period (2016-2020). The amount of Egyptian exports to Russia represents about 34.2% of the average Egyptian agricultural exports to this crop during the search period, Greece is ranked second, as it imported approximately 76.3.

It turns out that the UAE, Lebanon, Iraq, Kuwait, the most important Arab countries, to absorb the Egyptian exports of potatoes with rates of 7%, 9%, 2%, 3% of the total average amount of Egyptian agricultural exports of potatoes during the same period, at the arrangement, and the group of previous countries is the most important The traditional markets of Egyptian exports of potatoes, where the amount of exports was estimated at about 93% of the average total amount of Egyptian agricultural exports from the same crop during the search period. The geographical concentration transactions of the amount and value of Egyptian exports from the potato crop were estimated at about 39.7%, 37.9%, respectively during the search period, and thus the geographical concentration transactions are considered low from the Michely point of view, where Egyptian agricultural exports were distributed from this crop on about 20 countries in varying quantities and prices During the period (2016-2020).

Table (8): The relative importance of the quantity and value of potato exports in the world during the period (2016-2020).

Countries	The average quantity of exports (thousand tons)	%	Average value of exports (million dollars)	%
Netherlands	1959.59	14.69	841.7	18.7
France	2186.99	16.40	688.7	15.3
Germany	1925.99	14.44	399.9	8.9
Canada	514.94	3.86	253.8	5.6
China	462.59	3.47	307.5	6.8
United States of America	514.80	3.86	244.1	5.4
Belgium	1027.68	7.71	219.6	4.9
Egypt	637.43	4.78	241.8	5.4
United Kingdom	166.94	1.25	147.8	3.3
Spain	289.54	2.17	136.7	3.0
India	322.04	2.41	66.5	1.5
Pakistan	479.98	3.60	97.1	2.2
Israel	89.24	0.67	67.0	1.5
Denmark	125.25	0.94	61.7	1.4
Russian Federation	270.15	2.03	33.4	0.7
Italy	106.72	0.80	56.7	1.3
Belarus	25.51	0.19	54.7	1.2
Total	11105.41	83.366	3918.8	86.9
Rest world	2232.33	16.74	590.5	13.1
Total world	13337.74	100	4509.3	100.0

source: Trade Map - List of exporters for the selected product (Potatoes, fresh or chilled)

Thousand tons, at a value of about 26.7 million dollars as an average during the study period, and these imports represent about 12% of the total amount of Egyptian exports from the same crop
during the search period. And that the most important European countries to absorb the crop are Italy, Germany, Slovenia, Romania, with rates of about 8%, 5%, 3%, 2%of the total average amount of exports of the crop during the same period in a row.

Table (9): The geographical distribution of the Quantity e and value of Egyptian exports of potatoes during the period (2016-2020).

Countries	Quantity (thousand tons)	%	Value(Million dollars)	%
Russian Federation	218,151	34.2	70,786	31.8
Greece	76,326	12.0	26,699	12.0
United Arab Emirates	44,044	6.9	15,071	6.8
Italy	51,627	8.1	19,391	8.7
Germany	33,176	5.2	12,759	5.7
Lebanon	57,393	9.0	19,246	8.6
Iraq	13,948	2.2	5,090	2.3
Slovenia	17,556	2.8	6,376	2.9
Sultanate of Oman	16,800	2.6	5,572	2.5
Belgium	8,024	1.3	3,203	1.4
Kuwait	21,696	3.4	7,857	3.5
Syrian Arab Republic	14,723	2.3	6,189	2.8
Kingdom Saudi Arabia	2,751	0.4	1,082	0.5
Ukraine	3,109	0.5	1,110	0.5
Netherlands	3,658	0.6	1,364	0.6
Turkey	13,468	2.1	6,045	2.7
Bahrain	3,766	0.6	1,343	0.6
Spain	1,848	0.3	710	0.3
United Kingdom	6,983	1.1	2,988	1.3
Croatia	3,860	0.6	1,337	0.6
Total these countries	612,905	96.2	214,216	96.1
Rest world	24,523	3.8	8,645	3.9
Total exports of Egypt	637,429	100.0	222,861	100.0
Geographical concentration		39.7	0	37.9

source: Trade Map - List of exporters for the selected product (Potatoes, fresh or chilled)

8- The relative feature of the potato crop:

By extrapolating the results of the schedule (10) it was found that Egypt has a high virtual feature for the potato crop during the period (2006-2020), and that this feature reached its maximum in 2015 and is estimated at about 32.1 and its lowest in 2009 and is estimated at about 9.6, a decrease from 2015 It is estimated at about 30 %, and the general average of the relative feature of the period is about 18.8 during the research period.

Table (10): The relative feature indicator of Egypt's exports of potatoes during the period (2020-2006)

Years	The value of Egypt's exports of potatoes (million dollars)	The value of world exports of potatoes (billion dollars)	The value of Egypt's agricultural exports (million dollars)	The value of the world's agricultural exports (billion dollars)	The apparent relative feature
2006	65.3	2.74	1087.5	721.3	15.8
2007	108.0	3.40	1502.5	872.8	18.4
2008	176.1	3.49	2064.6	1063.7	26.0
2009	145.4	3.20	4494.1	950.8	9.6
2010	131.9	3.63	2451.5	1077.8	16.0
2011	250.7	4.69	3847.7	1189.3	16.5
2012	127.4	3.71	2345.8	1183.1	17.3
2013	205.9	4.75	3231.7	1215.7	16.3
2014	326.8	4.33	3595.2	1506.9	31.6
2015	231.7	3.69	3541.5	1812.5	32.1
2016	147.1	4.00	3731.6	1417.6	14.0
2017	272.1	4.34	3778.2	1560.5	25.9
2018	206.9	4.38	3689.6	1053.1	13.5
2019	266.2	5.03	3956.5	1205.2	16.1
2020	221.9	4.29	5027.3	1285.4	13.2

The general average of the period	**192.2**	**4.0**	**3223.0**	**1207.7**	**18.8**

Source: Group and calculated from the statistical database (FAOSTAT), Food and Agriculture Organization of the United Nations, (2006-2020).

9-Potatoes competitiveness index:

It is clear from the schedule of (11) the increase in the strength of the competitive center of the exports of the Egyptian potato crop in the face of the exports of the potato crop for all France, Germany, Belgium, India, Pakistan, Israel, Denmark and the Russian Federation, where the relative price reached the prices of potato exports during the period (2006-2020) about 71.95, 49.16, 52.19 , 53.58, 54.30, 65.19, 94.21, 39.56, respectively, while the same table showed the weakening of the competitive center of Egyptian potatoes exports to the exports of the potato crop for the Netherlands, Canada, China, America, Spain, Italy, at a relative price of about 110.65, 101.82, 113.57, 116.39, 103.59, 138.28, respectively.

Table (11): The relative price of potato exports during the period (2006-2020).

Countries	Real price	The relative price	Countries	Real price	The relative price
Egypt	399.53	-	Spain	413.87	103.59
Netherlands	442.07	110.65	India	214.07	53.58
France	295.47	71.95	Pakistan	216.93	54.30
Germany	196.40	49.16	Israel	260.47	65.19
Canada	406.80	101.82	Denmark	376.4	94.21
China	453.73	113.57	Russian Federation	158.07	39.56
United States of America	465.0	116.39	Italy	552.47	138.28
Belgium	208.53	52.19	-	-	-

source: Trade Map - List of exporters for the selected product (Potatoes, fresh or chilled)

9-Countries competing for the amount and value of Egyptian exports from potatoes during the period (2016-2020):

It is clear from Table (12) that Egypt exports approximately 637.4 thousand tons of potato crop by 4.8% of the total average exports of the world from the potato crop with a value of about 222.861 million dollars, representing about 5.1% of the total average value of the world's exports of potatoes during the period during the period from (2016- 2020), it is also clear from the table that France is the most important countries competing for Egypt and exporting the potato crop, as it exports approximately 2.1 million tons, representing about 16.6% of the total average amount of exports of the world from the potato crop with a value of about 672.848 million dollars, representing about 15. 3%, while the Netherlands ranked second in the competing countries for Egypt in terms of the amount of exports by about 1.96 million tons, representing about 14.9% of the total average exports of the world from the same crop with a value of about 829.4 million dollars, representing about 18.8% of the total value of the world's exports of potatoes for the average Period. While Germany came in the third place of the competing countries for Egypt in exporting this crop with a quantity of about 1.92 million tons, at a value of about 391.2 million dollars, representing about 8.9 % of the total average value of the world's exports of potatoes, followed in the ranking each Belgium, Canada, the United States and China at 7.8 % rates , 4.8 %, 3.9 %, 3.9 %, 3.5 %, respectively, out of the total global exports of potatoes. The group of previous countries is the most important export market for potato crops in the world, as the exports of these countries reached about 90.5% of the total average global exports of potatoes by an estimated 87.9% of the total number of global exports of the crop during the period (2016-2020), while the rest is reached The countries of the world are about 9.5% of the total average exporting amount of the world of the crop.

Table (12): The most important competing countries for the Quantity and value of Egyptian exports of potatoes during the period (2016- 2020).

Countries	Exports Value (Million dollars)	%	Countries	Exports Quantity (thousand tons)	%
Netherlands	829,434	18.8	France	2,187.0	16.6
France	672,848	15.3	Netherlands	1,962.2	14.9
Germany	391,243	8.9	Germany	1,923.8	14.6
Canada	248,651	5.6	Belgium	1,027.7	7.8
China	291,472	6.6	Egypt	637.4	4.8
United States of America	236,160	5.4	Canada	514.9	3.9
Belgium	217,801	4.9	United States of America	514.8	3.9
Egypt	222,861	5.1	China	462.6	3.5
United Kingdom	147,991	3.4	Russian Federation	270.1	2.0
Spain	136,449	3.1	Kazakhstan	219.8	1.7
India	65,223	1.5	India	322.0	2.4
Pakistan	93,279	2.1	Spain	289.5	2.2
Israel	72,440	1.6	Pakistan	480.0	3.6
Denmark	60,661	1.4	South Africa	157.6	1.2
Russian Federation	31,188	0.7	Israel	223.1	1.7
Italy	59,825	1.4	Denmark	156.6	1.2
Belarus	46,660	1.1	Iran	380.5	2.9
South Africa	48,487	1.1	Turkey	194.1	1.5
Rest world	534	12.1	Rest world	1258	9.5
Total World	4,406,757	100.0	Total World	13,182	100

Source: Trade Map - List of exporters for the selected product (Potatoes, fresh or chilled).

11-The gravitational model for the Quantity of Egyptian exports from the potato crop:

Each of the basic model and the modified model of the gravitational model was estimated to measure the impact of the variables in question on the quantities exported of Egyptian potatoes, shown in Table (13) where the equation (1) expresses the results of the basic model, and the equation (2) on the results of the modified model, and the gravitational form was estimated For potato exports between Egypt and the most important countries importing potatoes during the previous five years (2016-2020), accordingly, six countries were Russia, Greece, UAE, Italy, Germany, Lebanon, where the percentage of exports during that period reached about 84.2%.

The equation No. (1) in Table (13) indicates the statistical morale of the positive effect of the Egyptian national product (x_2) in increasing the quantities exported of potatoes by about 0.13%, and the statistical morale has not proven to the negative effect of the national product of these countries (x_1), and the positive effect of the geographical distance between Egypt and those countries (x_3), and the negative effect of language (D) on the quantities exported of potatoes during the (2006-2020 period), and the total flexibility indicates that the increase in these factors by about 10% leads to an increase in the quantities exported of potatoes by about 0.64%, as indicates the results indicate The variables explain about 12% of the changes occurring in the quantities exported of Egyptian potatoes and the rest is 88% due to the variables that are not scored in the model, and the value (F) the 3.17 indicates a sign of the model used at a moral level 0.01.

The equation No. (2) in Table (13) to the statistical morale of the positive effect of the average per capita share of those countries (x_1¯) showed in increasing the quantities exported of potatoes by about 0.12%, and the statistical moral of the positive effect of the average per capita share in Egypt (x_2¯) in Increasing the quantities exported of potatoes by about 0.15%, as well as statistical morality of the positive effect of language (D) in increasing the quantities exported of potatoes by about 0.22%, while the statistical morale has not proven to the positive effect of the geographical distance between Egypt and those countries (x_3), and the total flexibility indicates that Increasing these factors by about 10% leads to an increase in the quantities exported of potatoes by about 4.8%. The results indicate that the

variables explain about 14% of the changes that occur in the amount of Egyptian potato exports and the rest of 86% are due to other factors that are not scored in the model, and the value of F, which amounts to 3.8, indicates a sign of the model used at a morale 0.01.

Table (13) results of the gravitational models for Egyptian exports from the Al-Batas crop to the most important importing countries during the period (2006 -2020).

Variable	Equation	R^2	F
basic model	Lny= 4.78 -0.068Lnx1 + 0.13 Lnx2 + 0.011 Lnx3 – 0.006 D (-0.04) (1.17) ** (3.54) (-1.36)	0.12	3.17**
Modified	Lny= 4.96 +0.12 Ln X_1^- + 0.15 Ln X_1^- + 1.68 Lnx3 + 022 D *(1.95) (0.3) ** (3.9) ** (2.03)	0.14	3.8**

Whereas: ** moral at 0.01 * moral at 05 level, Y= the Quantity of Egyptian exports from the crop with a thousand tons

X_1 = GDP Billion dollars GDPJ, X_2 = Egyptian GDP by one billion dollars GDPI

X_3 = The geographical distance between Egypt and the chosen countries (km) Disij

D = Photo variable (language), as the Arabic language takes the value of (1) and the foreign language takes the value (zero)

X_1^- = Paradise's share of the state's domestic product per thousand PC GDPJ

X_2^- = Paradise of Egyptian GDP per thousand PC GDPI

Source: Massaged of table data No. (1), (2) at the appendix.

Summary and Recommendations:

The potato crop is considered one of the most important strategic vegetables crops in Egypt as it is one of the food and industrial crops on which some food industries are based, it is also an important source of national agricultural income and obtaining the necessary foreign exchange to advance the wheel of economic development through the possibility of its contribution to increasing the outcome of Egyptian agricultural exports.

The results showed the decrease in the quantities exported from the potato crop in Egypt, as the exported amount decreased from 808.2 thousand tons in 2017 to 561.4 thousand tons in 2020, representing 30% of the exporting amount in 2017, which is reflected in the balance of payments and the availability of hard currency, due to this To. Covid 19 Pandemic.

The research dealt with identifying the development of the space and production of the potato crop, the amount, the value of export and geographical distribution indicators of the competitiveness of Egyptian potatoes in some global markets, and the determinants of external demand using the gravitational model for the potato crop.

he most important results were:

The potato crop ranked first in the area of the vegetable crops with about 436.6 thousand feddan, representing about 22.7%, while the tomato crop ranked second with about 408 thousand feddan, representing 21.3%, from the total area of the republic, which is around 1918.5 thousand feddan during the period (2016-2020), at the governorate level, Beheira Governorate ranked first with about 67.81 thousand feddan, representing about 15.5%, followed by the New Valley Governorate with about 47.41 thousand feddan, representing about 10.86%, they follow them from the third to sixth place, Menoufia, Dakahlia, Nubaria and Minya, with about 45.6, 45.4, 41.50, 40.4 thousand acres, representing about 10.4%, 10.4%, 9.5%, 9.3%, respectively, from the total area of the potato crop in the governorates of the Republic.

Economic indicators showed that the area of the potato crop is increasing at a statistically moral rate of 15.45 thousand acres, represents 4.07% of its average during the search period, that the productivity of the acre from the potato crop is increasing with a statistically moral rate of 0.11 tons, representing 0.98% of its average, and that the amount exported from the potato crop It is increasing at an annual statistically moral rate of about 0.16 thousand tons, representing 0.003% of its average during the search period, the value of the exports of the potato crop is increasing annually with a statistically moral rate of 0.04 million dollars, representing 0.021% of its average during the search period, and the results of the instability factor indicate that the value of exports was more stable than the amount of exports and export price for the potato crop, as it reached about 6.4, 9.3, 19.8 Respectively.

It was found from the research that the Netherlands ranked first in global potato exports with a value of 847.7 million dollars, representing 18.7%, while France ranked second with a value of 688.7 million dollars, represented 15.3%, while Germany, China and Canada ranked third, fourth and fifth with values 399.9 million dollars, 307.5 million dollars, 253.8 million dollars, representing 8.9%, 6.8%, 5.6%, respectively, the United States and Egypt ranked sixth and seventh with a value of 244.1 million dollars, 24.8 million dollars, representing 5.4%, respectively, and Egypt's exports of potatoes reached about 637.4 million tons, estimated at 222.9 million dollars, and Russia is considered one of the most important countries importing potatoes , As it imported approximately 218.2 thousand tons, at a value of about 70.8 million dollars for the average period (2016-2020).

While France is considered one of the most important countries competing for Egypt and exporting the potato crop, as it leads approximately 2.1 million tons, representing about 16.6%, the Netherlands ranked second with about 1.96 million tons, representing about 14.9%, and is ranked third in Germany with about 1.92 million tons It represents about 8.9%, and these three countries export about 90.5% of the amount of global exports of potatoes, with a value of 87.9% of the value of global exports to the crop during the period (2016-2020).

The results indicate that Egypt has a high virtual relative feature for the potato crop during the period (2006-2020), and that this feature reached its maximum in 2015 and is estimated at 32.1 and its lowest in 2009 and is estimated at about 9.6, a decrease from 2015 estimated at about 30 %, The general average of the relative feature of the period was about 18.8.

The results of the gravitational model indicate the statistical morale of the positive effect of the average per capita share of those countries (x_1¯) in increasing the quantities exported of potatoes by about 0.12%, and the statistical moral of the positive effect of the average per capita share in Egypt (x_2¯) in increasing the quantities exported of potatoes by about 0.15%, as well as statistical morality of the positive effect of language (D) in increasing the quantities of potatoes by about 0.22%, while statistical morals did not prove the positive effect of the geographical distance between Egypt and those countries (x3), the total flexibility indicates that the increase in these factors by about 10% leads to an increase in the quantities exported of potatoes by about 4.8%, and that these variables explain about 14% of the changes occurring in the amount of Egyptian potato exports and the rest is 86% due to other factors that are not scored in the model, and indicates. The value of F, which is 3.8 to the morale of the model used at a morale 0.01.

Based on the results, the research is recommended:

1. Establishing logistical and export centers for potatoes in the most important governorates producing them to encourage farmers to increase the cultivated areas and provide the necessary quantities for exporters (Beheira, New Valley, Menoufia, Nubaria and Minya).
2. Due to the compulsory feature of the potatoes, the work of Egyptian exports to encourage producers and exporters with investment incentives that enable them to open new markets that is important to increase exports of potatoes.
3. Attention to contractual crops for export and expansion in the required items globally.

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Appendices:

Table (1) the most important importing countries for Egyptian potatoes during the period (2006-2020) in a thousand tons.

Years	Russian	Greece	Emirates	Italy	Germany	Lebanon
2006	88.423	0.348	97.337	63.226	19.77	318.987
2007	59.515	6.61	77.98	38.659	78.041	322.084
2008	66.855	5.037	90.817	13.57	48.843	303.715
2009	45.04	1.208	30.277	39.752	22.524	167.83
2010	57.927	0.158	63.367	29.668	23.711	243.266
2011	57.416	0.485	66.081	35.724	17.598	500.273
2012	35.592	3.792	35.368	47.347	22.866	207.52
2013	47.361	21.333	79.05	14.404	47.74	337.792
2014	21.639	40.999	54.851	27.206	51.192	508.888
2015	50.888	46.02	57.915	13.227	40.078	451.707
2016	38.764	24.441	59.318	28.569	61.684	343.472
2017	85.963	65.272	64.749	31.353	66.316	638.856
2018	65.682	51.9	31.657	31.92	49.666	588.552
2019	120.948	28.528	64.395	37.132	72.736	456.182
2020	70.271	50.079	38.014	36.904	36.563	376.516

https://www.com-trade.org4-

Table (2) National product and average per capita output of national product during the period (2006-2020).

Years	Average per capita national product) thousand dollars(							National product) billion dollars(						
	Egypt	Russian	Emirates	Italy	Greece	Germany	Lebanon	Egypt	Russian	Emirates	Italy	Greece	Germany	Lebanon
2006	1.40	6.92	41.91	33.50	24.80	36.32	4.63	107.43	989.93	222.12	1947.92	273.32	2992.20	22.02
2007	1.67	9.10	41.81	37.82	28.83	41.59	5.21	130.44	1299.71	257.92	2210.29	318.50	3421.23	24.83
2008	2.04	11.64	44.50	40.78	32.00	45.43	6.11	162.82	1660.85	315.47	2398.86	354.46	3730.03	29.12
2009	2.33	8.56	32.02	37.08	29.71	41.49	7.35	189.15	1222.64	253.55	2191.24	330.00	3397.79	35.40
2010	2.65	10.67	33.89	36.00	26.69	41.53	7.76	218.98	1524.92	289.79	2134.02	296.84	3396.35	38.44
2011	2.79	14.31	39.19	38.60	25.45	46.64	7.68	235.99	2045.93	350.67	2291.99	282.63	3744.41	39.93
2012	3.23	15.42	40.98	35.05	21.91	43.86	7.95	279.12	2208.30	374.59	2087.08	242.04	3527.34	44.04
2013	3.26	15.97	42.41	35.55	21.78	46.29	7.93	288.43	2292.47	390.11	2141.32	238.84	3732.74	46.91
2014	3.38	14.10	43.75	35.52	21.59	47.96	7.69	305.60	2059.24	403.14	2159.13	235.14	3883.92	48.13
2015	3.56	9.31	38.66	30.23	18.08	41.09	7.66	329.37	1363.48	358.14	1835.90	195.60	3356.24	50.07
2016	3.52	8.70	38.14	30.94	17.91	42.11	7.65	332.44	1276.79	357.05	1875.80	193.02	3467.50	51.39
2017	2.44	10.72	40.64	32.33	18.54	44.54	7.82	235.73	1574.20	385.61	1956.95	199.35	3681.73	53.32
2018	2.54	11.29	43.84	34.61	19.75	47.95	8.06	249.71	1657.33	422.22	2090.91	211.95	3975.35	55.28
2019	3.02	11.50	42.70	33.64	19.13	46.79	7.58	303.08	1687.45	417.22	2009.38	205.14	3888.33	51.95
2020	3.57	10.13	36.28	31.71	17.62	46.21	4.65	365.25	1483.50	358.87	1888.71	188.84	3846.41	31.74

Source: Data world Bank, 2022

6/24/2022