Measuring the Impact of some International Variables on Agricultural Trade (Citrus and Grapes) between Egypt and BRICS Using the Gravity Model

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ABSTRACT

Egypt is interested in foreign trade as it leads to an increase in trade flow between it and many countries in the world in general and the BRICS countries in particular, through the trade agreements concluded by Egypt with the BRICS bloc, and in light of Egypt's abundance and diversity of natural resources and competitive advantages in agricultural production, as economic motives are available for economic integration between Egypt and many Arab and international blocs. The study indicates that there is a disparity in the distribution of labor, capital, and the rest of the productive resources between the various economic blocs, as well as the fluctuation of Egyptian exports of agricultural commodities to the BRICS countries from year to year at high rates in recent years, which led to the necessity of studying the demand for these commodities in the BRICS markets. The research aims to try to improve the position of Egyptian agricultural exports with the BRICS countries, as it was found that there is a direct relationship between the gross domestic product of the importing countries and the import price in dollars per ton, and an inverse relationship between the exchange rate and the quantity of Egyptian exports, which is consistent with economic logic. It was also shown that by increasing the gross domestic product of importing countries by about 1 million dollars, the quantity of Egyptian exports increases by about 300 tons, and by increasing the import price by about 1 dollar/ton, the quantity of exports increases by about 100 tons. It was also shown that increasing the population leads to an increase in Egyptian exports to importing countries, as increasing the population by about 1 million people leads to an increase in the quantity of exports by about 400 tons.

Keywords: Gravity model, foreign trade, BRICS countries.

INTRODUCTION

Foreign trade is one of the activities that play an effective role in supporting the national economy, supporting sustainable development efforts and achieving better rates of economic growth. It is also directly related to economic growth rates. As a country's foreign trade increases, its economy becomes more stronger, especially if exports are added value goods and a high industrial and technological component, and imports are related to production and manufacturing requirements. Many countries rely on foreign trade as an effective tool in achieving sustainable development, creating added value for the national economy, increasing income, reducing unemployment and treating economic problems (Abdelhakim *et al.*, 2018).

Egypt is interested in foreign trade as it works to increase trade flow between it and many countries of the world, through trade agreements conducted by Egypt with many countries and global economic blocs. Naturally, and in light of Egypt's plenty and diversity of natural resources, one would expect strong economic motives for economic integration between Egypt and many Arab and global blocs. There is an inequity in the distribution of labor, capital, and resources between blocs. This research deals with measuring the impact of some international variables on agricultural trade using the gravity model. The area of these countries constitutes a quarter of the land area, and their population is approximately 40% of the Earth's population. By 2050, the economies of these countries are expected to compete with the today economies of the richest countries in the world, according to the global banking group Goldman Sachs, which was the first to use this term in 2001. These countries are expected to form an alliance or political club among themselves in the future, and the agricultural value of Egypt's exports to the BRICS countries during the study period ranged between a minimum of about $5.97 million in 2006 and a maximum of about $934.9 million in 2022, with an annual average of about $2.446 million during the period (2005-2022) (Elbahai, 2018).

Research problem:

Different related to primary trade for Egyptian agricultural commodities indicate that Egyptian exports of agricultural commodities to BRICS countries fluctuate from year to year at high rates, which has led to the necessity of studying the BRICS countries' demand for these commodities, especially in large markets such as the Russian, Indian and Chinese markets, by relying on the gravity model (Haberler, 1964).

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Study objectives:

The study aims at improving the position of Egyptian agricultural exports with the BRICS countries through several sub-objectives, which are:

1- Analyzing the current status of agricultural exports to the BRICS countries at the level of goods and at the level of countries during tow deferent periods (2005-2022).

2- Estimating the gravity model, To know the most important commercial markets in relation to the distance.

Research Method and Data Sources:

The research relied in its analysis on qualitative analysis methods represented in calculating averages and relative importance, and general time trend analysis models. Not only that, but the research relied mainly on the gravity model as follows (Abdelhakim *et al.,* 2018):

Where the gravity model used in trade, the amount of trade or exports or imports between two countries (Xij) is a function of the gross domestic product (GDP) for each of the two countries and the population in each of them as well as the geographical distance between them (between the capitals of the two countries, or commercial centers) in addition to a set of dummy variables as follows:

$$X_{ij} = \beta_0 Y_i^{\beta 1} Y_j^{\beta 2} N_i^{\beta 3} N_j^{\beta 4} D_{ij}^{\beta 5} A_{ij}^{\beta 6} u_{ij} \quad (1)$$

Where:

Xij: the amount of trade, exports or imports between each two countries,

Yi, Yj: the GDP of the exporting and importing countries respectively,

Ni, Nj: the population of the exporting and importing countries respectively,

Dij: the distance between the capitals (or commercial centers) of the two countries,

Aij: represents any other factors that help or impede the trade between two countries,

uij: is the error term.

There is an alternative formulation of Equation (1) uses per capita income instead of population.

$$X_{ij} = \gamma_0 Y_i^{\gamma 1} Y_j^{\gamma 2} YH_i^{\gamma 3} YH_J^{\gamma 4} D_{ij}^{\beta 5} A_{ij}^{\beta 6} u_{ij} \quad (2)$$

Where:

YHi, YHj : the per capita income of the exporting and importing country respectively.

Equation (1) and Equation (2) are considered equal if the coefficients are as follows:

$\beta_3 = -\gamma_3$; $\beta_4 = -\gamma_4$; $\beta_1 = \gamma_1 + \gamma_3$; $\beta_2 = \gamma_2 + \gamma_4$

The second equation formulation is usually used in the case of estimating bilateral exports of specific products, while the first equation formulation is used in the case of estimating total exports.

In the case of estimation, model (1) can be expressed in the double logarithmic form as follows:

$$\log X_{ij} = \beta_0 + \beta_1 \log Y_i + \beta_2 \log Y_j + \beta_3 \log N_i + \beta_4 \log N_j + \beta_5 \log D_{ij} + u_{ij} \quad (3)$$

Where: log indicates that the variables are in logarithmic form. The following formula was used when estimating:

$$\text{LogXij} = \beta_0 + \beta_1 \log Y_i + \beta_2 \log Y_j + \beta_3 \log N_i + \beta_4 \log N_j + \beta_5 \log \text{Dis}_{ij} + \beta_6 \log \text{Ydif}_{ij} + \beta_7 \log R + \beta_8 \text{Dumm}_1 + u_{ij} \quad (4)$$

Where:

Ydifij: refers to the square of the differences in the GDP of the exporting and importing country,

R: refers to the exchange rate of the exporting country against one unit of the importing country's currency, and

Dumm1 refers to a dummy variable that takes the value one if the country joins to a bloc, and zero if the country does not join a bloc.

The research also relied on published and unpublished secondary data from the Food and Agriculture Organization of the United Nations (FAO) website, the Trade Map website, and agricultural economics publications from the Economic Affairs Sector in the Ministry of Agriculture and Land Reclamation, in addition to World Bank data (El Shafei, 2017).

First: The relationship between Egypt and the BRICS countries:

This section studies the relationship between Egypt and BRICS in terms of the value of exports, imports, and agricultural trade balance during the period (2005-2022).

BRICS (Brazil, Russia, India, China and South Africa) is an acronym for the initials of the countries participating in this economic bloc, which are currently: Brazil, Russia, India, China and South Africa. This bloc was previously called "BRIC" before South Africa joined the group in 2010, when the letter S was added to its name and the group's name became "BRICS". It is proposed to change the name to "BRICS Plus" after the South African president announced on August 24, 2023, during the BRICS summit held in his country, the acceptance of six new countries to join BRICS, namely Saudi Arabia, the United Arab Emirates, Egypt, Argentina, Ethiopia and Iran, starting from January 1, 2024

(Tinbergen, 1965). The first summit between the heads of the four founding countries (Brazil, Russia, India and China) was held in Yekaterinburg, Russia, in June 2009, which included the announcement of the establishment of a bipolar world system. The first high-level meeting of BRIC leaders was held in July 2008 on the Japanese island of Hokkaido, where the eight largest countries (G8) summit was held. The BRIC summit was attended by Russian President Vladimir Putin, Chinese President Hu Jintao, Indian Prime Minister Manmohan Singh, and Brazilian President Luiz Inacio Lula da Silva. The heads of state agreed to continue coordination on global economic issues, including cooperation in the global financial system and resolving food supply issues (Hassan, 2014).

Second: Studying the value of exports, imports and the agricultural balance of Egypt with the BRICS countries:

1- **Studying the value of Egypt's agricultural exports to BRICS countries**:

It is shown from studying the indicators in Table (1), that the agricultural value of Egypt's exports to the BRICS countries during the study period ranged between a minimum of about $5.97 million in 2006 and a maximum of about $934.9 million in 2022, with an annual average amounted to about $2.446 million during the period (2005-2022).

By studying the equation of the time trend for the development of the agricultural value of Egypt's exports to the BRICS countries during the period (2005-2022) in Table (2), it is shown that the agricultural value of Egypt's exports to the BRICS countries took a general increasing trend by a statistically significant annual quantity amounted to about $5.40 million. The coefficient of determination (R^2) reached about 0.89, which means that 89% of the changes in the agricultural value of Egypt's exports to the BRICS countries are due to factors whose effect is reflected by the time variable. The significance of the model used for measurement was generally proven using the calculated (F) value.

2- Studying the value of Egypt's agricultural imports from BRICS countries:

It is clear from studying the indicators in Table (1), that the agricultural value of Egypt's imports from the BRICS countries during the study period ranged between a minimum of about $4.976 million in 2005 and a maximum of about $3.5650 million in 2022, with an annual average amounted to about $3712.5 million during the period (2005-2022).

By studying the equation of the time trend for the development of the agricultural value of Egypt's imports with the BRICS countries during the period (2005-2022) in Table (2), it is shown that the agricultural value of Egypt's imports with the BRICS countries took a general increasing trend by a statistically significant annual quantity amounted to about 233.2 million dollars. The coefficient of determination (R^2) reached about 0.67, which means that 67% of the changes in the agricultural value of Egypt's imports with the BRICS countries are due to factors whose effect is reflected by the time variable. The significance of the model used for measurement was proven in general by using the calculated (F) value.

3- Studying the value of Egypt's agricultural balance with the BRICS countries:

It is clear from studying the indicators in Table (1), that the agricultural value of Egypt's trade balance with the BRICS countries during the study period ranged between a minimum of about 858.5 million dollars in 2005 and a maximum of about 4974.3 million dollars in 2018, with an annual average amounted to about 3266.3 million dollars during the period (2005-2022).

By studying the time trend equation for the development of the agricultural value of Egypt's trade balance with the BRICS countries during the period (2005-2022) in Table (2), it is shown that the agricultural value of Egypt's trade balance with the BRICS countries took a general decreasing trend by a statistically significant annual quantity amounted to about 421.5 million dollars. The coefficient of determination (R^2) reached about 0.58, which means that 58% of the changes in the agricultural value of Egypt's trade balance with the BRICS countries are due to factors whose effect reflected by the time variable. The significance of the model used for measurement was generally proven by using the calculated (F) value.

Table 1. The value of Egypt's agricultural exports and imports with the world and BRICS countries in millions of dollars during the period (2005-2022)

Year	Value of Egypt's agricultural exports to BRICS countries	Value of Egypt's agricultural imports from BRICS countries	Agricultural value of the balance of BRICS countries
2005	117.9	976.4	-858.5
2006	97.5	1015.0	-917.5
2007	155.8	1660.7	-1504.9
2008	241.6	2823.7	-2582.1
2009	245.1	2300.3	-2055.2
2010	422.7	2695.6	-2273.0
2011	512.3	3912.4	-3400.1
2012	341.2	5291.8	-4950.6
2013	362.4	3514.1	-3151.7
Average of the first period	277.4	2687.8	-2410.4
2014	492.9	4390.0	-3897.1
2015	430.1	4608.8	-4178.7
2016	410.2	4154.2	-3744.1
2017	564.9	4880.8	-4315.8
2018	633.7	5608.0	-4974.3
2019	647.3	5513.5	-4866.3
2020	676.4	4424.2	-3747.8
2021	744.3	3405.3	-2661.0
2022	934.9	5650.3	-4715.4
Average of the second period	615.0	4737.2	-4122.3
The general average	446.2	3712.5	-3266.3
minimum	97.5	976.4	-4974.3
maximum	934.9	5650.3	-858.5

Source: www.trademap.org

Table 2. Time trends of the value of Egypt's agricultural exports and imports with BRICS countries in million dollars during the period (2005-2022)

S	The dependent variable	Time trend equation	R^2	F	Growth rate
1	Value of Egypt's agricultural exports to BRICS countries	Y = 61.9 +40.5 X (11.3)**	0.89	126.69*	9.08
2	Value of Egypt's agricultural imports from BRICS countries	Y = 1497.5 +233.2 X (5.7)**	0.67	32.31*	6.28
3	Agricultural value of the balance to BRICS	Y = 4196.8 – 421.5 X (-4.7)**	0.58	22.01*	12.90

Where:
Y = Value of the dependent variable (in million dollars)
Xi = Time variable where i (1, 2, 3, ..., 18)
The value in brackets indicates the calculated value of (T)
(R^2) Coefficient of determination (F) Significance of the regression model
(**)Indicates the significance of the regression coefficient at the 0.01 level.
(*)Indicates the significance of the regression coefficient at the 0.05 level.
(-)Indicates the insignificance of the regression coefficient.
Source: Collected and calculated from the data in Table (1).

Table (1), shows that the average value of Egypt's exports to BRICS countries during the first period (2005-2013) amounted to about $277.4 million, while the average value of Egypt's exports to BRICS countries during the second period (2014-2022) amounted to about $615.0 million, an increase estimated at about $337.6 million.

Table (1), shows that the average value of Egypt's imports with BRICS countries during the first period (2005-2013) amounted to about $2687.8 million, while the average value of Egypt's imports with BRICS countries during the second period (2014-2022) amounted to about $4737.2 million, in an increase estimated at about $2049.4 million.

Third: Measuring the impact of some international variables on agricultural trade between Egypt and BRICS using the gravity model

1- Egypt's citrus exports to BRICS countries during the period (2002-2022):

The following equation indicates the quantity of Egyptian citrus exports as a dependent variable and each of the distance, gross domestic product, import price, exchange rate, a transitional variable reflecting language, and population, as independent variables that are expected to have an impact on the quantity of Egyptian citrus exports, whether positive or negative, during the period from (2002-2022), through which the quantity of Egyptian citrus exports is estimated.

The estimated model shows that there is a direct relationship between the GDP of the importing countries and the import price in dollars per ton, but there is an inverse relationship between the exchange rate, language and the quantity of Egyptian exports. This is compatible with economic logic.

As the total product of importing countries increases by about 1 million dollars, the quantity of Egyptian exports increases by about 300 tons. It is also shown that as the import price increases by about 1 dollar/ton, the quantity of exports increases by about 100 tons.

The negative sign of the exchange rate is economically logical because of the inverse relationship between the exchange rate and the quantity of our exports, as a decrease in the exchange rate by about 1 dollar (the cost of importing countries decreases) leads to an increase in demand for Egyptian exports by about 3.4 thousand tons.

As the population increases, Egyptian exports to importing countries increase, an increase in the population by about 1 million people leads to an increase in the quantity of exports by about 400 tons.

The adjusted coefficient of determination for the model was about 0.87, which means that the variables included in the model explain about 87% of the change in the dependent variable, and the rest is due to factors not measured in the model, F-test indicates the significance of the model as a whole The significance of the model used for measurement was generally proven by using the calculated (F) value.

Equation Citrus exports to BRICS

$Y=3.8 +0.3 X_2+0.1 X_3 -3.4 X_4 +0.4 X_5$

(0.1) (7.3) (4.05) (-3.6) (11.4)

R^{-2}=0.87 F=45 **

Where:

Y_i: The quantity of Egyptian citrus exports in thousand tons.

X1: The distance between Egypt and the BRICS countries in kilometers, A variable that reflects an increase or decrease in intra-trade.

X2: The BRICS GDP in million dollars.

X3: The price of BRICS imports from Egypt in dollars per ton.

X4: The exchange rate.

X5: The population of the BRICS countries in million people.

The value in brackets indicates the calculated value of (T)

(**) Indicates the significance of the regression coefficient at the 0.01 level.

(*)Indicates the significance of the regression coefficient at the 0.05 level.

Source: Collected and calculated from the data in Table (3) by searching

2- Egypt's grape exports to BRICS countries during the period (2002-2022)

The following equation indicates the quantity of Egyptian grape exports as a dependent variable and each of the distance, GDP, import price, exchange rate, a transitional variable reflecting language, and population, as independent variables that are expected to have an impact on the quantity of Egyptian citrus exports, whether positive or negative, during the period from (2002-2022), through which the quantity of Egyptian grape exports is estimated (Rayhan, 2021).

The estimated model shows that there is a direct relationship between the GDP of the importing countries and the import price in dollars per ton, while there ia an inverse relationship between the

exchange rate, language and the quantity of Egyptian exports. This is compatible with economic logic (Myrdal, 1965).

As the total product of importing countries increases by about 1 million dollars, the quantity of Egyptian exports increases by about 200 tons, It is also shown that as the import price increases by about 1 dollar/ton, the quantity of exports increases by about 150 tons.

The negative sign of the exchange rate is economically logical because of the inverse relationship between the exchange rate and the quantity of our exports, as a decrease in the exchange rate by about 1 dollar (the cost of importing countries decreases) leads to an increase in demand for Egyptian exports by about 3.9 thousand tons.

As the population increases, Egyptian exports to importing countries increase. That is, an increase in the population by about 1 million people leads to an increase in the quantity of exports by about 290 tons.

The adjusted coefficient of determination for the model was about 0.67, which means that the variables included in the model explain about 67% of the change in the dependent variable, and the rest is due to factors not measured in the model, F-test indicates the significance of the model as a whole The significance of the model used for measurement was generally proven by using the calculated (F) value.

Equation of grape export to BRICS:

$Y=1.3 +0.2 X_2+0.15 X_3 -3.9 X_4 +0.29 X_5$

(0.4) (3.5) (6.7) (-5.2) (3.5)

R^{-2}=0.67 F=34.5**

Where:

Y: The quantity of Egyptian grape exports in thousand tons.

X1: The distance between Egypt and the BRICS countries in kilometers, A variable that reflects an increase or decrease in intra-trade..

X2: The BRICS GDP in million dollars.

X3: The price of BRICS imports from Egypt in dollars per ton.

X4: The exchange rate.

X5: The population of the BRICS countries in million people

The value in brackets indicates the calculated value of (T)

(**) Indicates the significance of the regression coefficient at the 0.01 level.

(*)Indicates the significance of the regression coefficient at the 0.05 level.

Source: Collected and calculated from the data in Table (4) by searching

Table 3. Gravity model data between Egypt and BRICS countries for orange crop during the period (2005-2022)

Years	Quantity of Egypt's orange exports to BRICS countries in thousand tons	Egypt's GDP in billion dollars	BRICS GDP in billion dollars	BRICS population in million	Exchange rate of pound to dollar	Average distance between Egypt and BRICS countries in kilometers
2005	55.93	89.60	5050.86	2837.69	5.78	14730.6
2006	75.75	107.43	6093.80	2864.76	5.73	14731.6
2007	40.76	130.44	7796.96	2891.16	5.64	14732.6
2008	70.69	162.82	9466.07	2917.37	5.43	14733.6
2009	97.48	189.15	9662.98	2943.37	5.54	14734.6
2010	132.82	218.98	11913.93	2969.31	5.62	14735.6
2011	162.76	235.99	14494.88	2996.30	5.93	14736.6
2012	234.20	279.12	15467.74	3025.18	6.06	14737.6
2013	145.31	288.43	16593.37	3053.77	6.87	14738.6
2014	270.92	305.60	17411.24	3081.53	7.08	14739.6
2015	260.46	329.37	16677.57	3108.43	7.69	14740.6
2016	203.87	332.44	16924.18	3134.72	10.03	14741.6
2017	218.67	248.36	18981.13	3160.85	17.78	14742.6
2018	234.53	262.59	20577.36	3184.67	17.77	14743.6
2019	306.09	318.68	21071.31	3206.18	16.77	14744.6
2020	338.60	383.82	20670.07	3224.73	15.76	14745.6
2021	308.95	424.67	24921.89	3238.39	15.64	14746.6
2022	319.40	476.75	25858.48	3248.79	19.16	14747.6

Source: Information Network, www.treadmap database, www.albankaldawli.org

Table 4. Gravity model data between Egypt and BRICS countries for grape crop during the period (2005-2022)

Years	The quantity of Egypt's grape exports to BRICS countries in thousand tons	Egypt's GDP in billion dollars	BRICS GDP in billion dollars	BRICS population in million	Exchange rate of pound to dollar	Average distance between Egypt and BRICS countries in kilometers
2005	0.14	89.60	5050.86	2837.69	5.78	14730.6
2006	0.17	107.43	6093.80	2864.76	5.73	14731.6
2007	0.21	130.44	7796.96	2891.16	5.64	14732.6
2008	3.63	162.82	9466.07	2917.37	5.43	14733.6
2009	4.12	189.15	9662.98	2943.37	5.54	14734.6
2010	4.56	218.98	11913.93	2969.31	5.62	14735.6
2011	4.95	235.99	14494.88	2996.30	5.93	14736.6
2012	8.18	279.12	15467.74	3025.18	6.06	14737.6
2013	7.86	288.43	16593.37	3053.77	6.87	14738.6
2014	6.75	305.60	17411.24	3081.53	7.08	14739.6
2015	8.44	329.37	16677.57	3108.43	7.69	14740.6
2016	11.76	332.44	16924.18	3134.72	10.03	14741.6
2017	10.20	248.36	18981.13	3160.85	17.78	14742.6
2018	16.16	262.59	20577.36	3184.67	17.77	14743.6
2019	10.09	318.68	21071.31	3206.18	16.77	14744.6
2020	13.88	383.82	20670.07	3224.73	15.76	14745.6
2021	13.05	424.67	24921.89	3238.39	15.64	14746.6
2022	15.58	476.75	25858.48	3248.79	19.16	14747.6

Source: Information Network, www.treadmap database, www.albankaldawli.org

Summary:

Foreign trade is one of the activities that play an effective role in supporting the national economy, supporting sustainable development efforts and achieving better rates of economic growth. It is also directly related to economic growth rates. The more a country's foreign trade increases, its economy becomes more stronger, especially if exports are of goods with high added value and a high industrial and technological component, and imports are related to production and manufacturing requirements. Many countries rely on foreign trade as an effective tool in achieving sustainable development, creating added value for the national economy, increasing income, reducing unemployment and treating economic problems. The agricultural value of Egypt's exports to the BRICS countries during the study period ranged between a minimum of about $5.97 million in 2006 and a maximum of about $934.9 million in 2022, with an annual average of about $2.446 million during the period (2005-2022). Various statistics on primary trade in Egyptian agricultural commodities indicate that Egyptian exports of agricultural commodities to the BRICS countries fluctuate, and fluctuate from year to year at high rates, which led to the need to study the BRICS countries' demand for these commodities, especially in large markets such as the Russian market, the Indian market and the Chinese market, by relying on the gravity model, the study aims at trying to improve the status of Egyptian agricultural exports with the BRICS countries. By studying the equation of the time trend for the development of the agricultural value of Egypt's imports with the BRICS countries during the period (2005-2022), it becomes clear that the agricultural value of Egypt's imports with the BRICS countries took a general increasing trend by a statistically significant annual quantity amounted to about 233.2 million dollars. The coefficient of determination (R^2) reached about 0.67, which means that 67% of the changes in the agricultural value of Egypt's imports with the BRICS countries are due to factors whose effect is reflected by the time variable.

The estimated model shows that there is a direct relationship between the GDP of importing countries and the import price in dollars per ton, while there is

an inverse relationship between the exchange rate, language and the quantity of Egyptian exports, which is compatible with economic logic. As the GDP of importing countries increases by about $1 million, the quantity of Egyptian exports increases by about 200 tons, and it is also clear that as the import price increases by about $1/ton, the quantity of exports increases by about 150 tons. The negative sign of the exchange rate is economically logical because of the inverse relationship between the exchange rate and the quantity of our exports, as a decrease in the exchange rate by about $1 (the cost of importing countries decreases) leads to an increase in demand for Egyptian exports by about 3.9 thousand tons, as the population increases, Egyptian exports to importing countries increase, i.e. an increase in population by about 1 million people leads to an increase in the quantity of exports by about 290 tons. The adjusted coefficient of determination for the model was about 0.67, which means that the variables included in the model explain about 67% of the change in the dependent variable, and the rest is due to factors not measured in the model.

Recommendations:

1- The necessity of having an export agency and highly efficient export organizations to study foreign markets.

2- Giving more attention to non-economic factors that encourage exports, including: effective marketing, raising the level of export services, facilitating and reducing the cost of export financing, reducing fees, facilitating administrative procedures in the field of export, and focusing on quality and commitment to international specifications.

3- The necessity of focusing on studying foreign import markets in terms of needs and standard specifications for quality, export dates and desired varieties.

4- Working to develop the structure of Egyptian exports so that more attention is given to goods with high added value.

5- The necessity of following a pricing and export policy that achieves a high competitive advantage in export markets and has the ability to confront competing countries**.**

6- Changing the places of crop cultivation, especially planting them in new lands.

7- Conducting new bilateral agreements between Egypt and the BRICS countries that will open new markets for agricultural products**.**

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الملخص العربي

قياس أثر بعض المتغيرات الدولية على التجارة الزراعية (للموالح والعنب) بين مصر والبريكس بإستخدام نموذج الجاذبية

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تهتم مصر بالتجارة الخارجية حيث تؤدي على زيادة التدفق التجاري بينها وبين العديد من دول العالم بصفة عامة ودول البريكس بصفة خاصة، وذلك من خلال من الإتفاقيات التجارية التي تبرمها مصر مع تكتل البريكس، وفى ضوء ما تتمتع به مصر من وفره وتنوع في الموارد الطبيعية والمزايا التنافسية في الإنتاج الزراعي، حيث تتوفر الدوافع الاقتصادية للإندماج الاقتصادي بين مصر والعديد من التكتلات العربية والعالمية، وتشير الدراسة إلى وجود تباين في توزيع العمالة، ورأس المال، وباقي الموارد الإنتاجية بين التكتلات الاقتصادية المختلفة، وكذلك تذبذب الصادرات المصرية من السلع الزراعية إلى دول البريكس من عام لأخر بمعدلات مرتفعة في السنوات الأخيرة، مما أدى لضرورة دراسة طلب على تلك السلع في أسواق دول البريكس، ويستهدف البحث إلى محاولة تحسين موقف الصادرات الزراعية المصرية مع دول البريكس، حيث تبين أن هناك علاقة طردية بين كل من الناتج المحلي الإجمالي للدول المستوردة، وسعر الاستيراد بالدولار للطن، ووجود علاقة عكسية بين سعر الصرف، وكمية الصادرات المصرية وهذا يتمشي مع المنطق الاقتصادي. وكذلك تبين أنه بزيادة الناتج الإجمالي للدول المستوردة بنحو ١ مليون دولار تزداد كمية الصادرات المصرية بنحو ٣٠٠ طن ، وكذلك زيادة سعر الإستيراد بنحو ١ دولار / طن تزيد كمية الصادرات بنحو ١٠٠ طن، كما تبين أن زيادة عدد السكان يؤدي الي زيادة الصادرات المصرية إلي الدول المستوردة، حيث أن زيادة عدد السكان بنحو ١ مليون نسمة يؤدي الي تزداد كمية الصادرات بنحو ٤٠٠ طن.

الكلمات المفتاحية: نموذج الجاذبية، التجارة الخارجية، دول البريكس.