Analysis of price policies for importing yellow maize in Egypt

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Abstract: The corn crop is one of the most prominent cereal crops grown in Egypt in terms of economic and nutritional importance, as it enters into human and animal nutrition and is used in many diverse food industries, so the demand for maize is increasing with the increase in this importance, and silage manufacturing is one of the most important uses of maize. Its importance in feeding animals in recent years, especially in the summer, when there is less green fodder needed to feed animals. The problem of the study is represented in the production deficit of the yellow corn crop, which amounted to about 8543 thousand tons, which represents 50% of meeting the consumer needs, which amounted to 17,086 thousand tons in 2018, which prompted the state to fill the deficit by importing from abroad and bearing hard currencies. The study indicates that the area planted with corn in Egypt reached the lowest of 1,482 thousand faddan in 2011, while the highest amounted to 2,525 thousand faddan in 2015, with an average of 2,082.5 thousand faddan, and an annual growth rate of 1.4% during the period (2005-2008), as for the sufficiency rate The subjective corn crop reached its lowest level at 48% in 2012, while it was highest at 79% in 2009, with an average of 57.9%, and a decreasing annual growth rate of -1.3%, and the average per capita share of the corn crop was the lowest at 82.11 kg/year in 2017, while it reached The highest was 108.93 kg/year in 2005, with an average of 92.6 kg/year, and a decreasing annual growth rate of -1.5% during the same period. The corn crop ranked second in Egyptian imports of agricultural grains after the wheat crop by 40.6%, and ranked sixth globally with a value of 1.9 billion dollars, representing 12.2%, out of the total value of corn imports, which amounted to 15.57 billion dollars in 2020. The results also indicate that the value of trade resource transfers is negative, reaching -313.29, which means that there is no real support for trade inputs. The value of local resource transfers is negative - 7.46, which indicates the lack of real support for local inputs. As for the value of net transfers, it was positive 150.86. The government intervention policies in favor of the importer in the short term, and the nominal protection coefficient was 0.96, which explains the extent of government intervention. As for the nominal protection rate for commercial inputs - 0.4 is less than the correct one, and this means that there is no support for the price of imported corn ton. While the effective protection coefficient, which amounted to 1.33 indicates the existence of a stimulating policy for importers, despite the presence of direct or indirect taxes on commercial and local inputs, and the importer's subsidy ratio reached 3.92. **Study recommends**: 1- The need for the state to work on importing its maize needs without Reliance on the private sector 2- Adopting a marketing policy that ensures consumers get their needs of yellow corn at the lowest price and highest efficiency 3- Increasing the cultivated areas of the crop and relying on modern high-productivity and high-protein varieties 4- Activating contract farming to ensure the marketing of the crop to farmers, increasing the cultivated area and reducing quantities 5 - Building storage silos to achieve food security and provide a strategic reserve for the state.

Keywords: Average per capita, self-sufficiency rate, imports, nominal protection factor, trade inputs

Introduction:

The maize crop is one of the most prominent grain crops grown in Egypt in terms of economic and nutritional importance, as it enters into human and animal nutrition and is used in many diverse food industries. Therefore, the demand for maize increases with this increasing importance, and silage manufacturing is one of the most important uses of maize. Its importance in feeding animals has increased in recent years, especially in the summer, when there is less green fodder needed to feed animals.

The crushed grains are also used for direct feeding of ruminants, sheep, poultry and birds. The maize grain is characterized by giving a greater amount of energy than other grain crops, but it is less

in its protein content, and in the manufacture of concentrated feed, where corn grains represent 50-70% of the components of these feeds. The by-products of the dry milling and wet milling process (during the oil extraction process) are used to feed animals, the most important of these products are corn, bran, gluten and molasses, and the dry parts of plants such as stalks and stems (firewood) are minced and used mixed with some other nutrients in animal nutrition. Either in direct form or used as an ingredient in the manufacture of concentrated feed. Minced stalks and stems can also be treated with liquid urea to raise its protein content. Since achieving a higher degree of food security than strategic food commodities is a strategic goal within the goals of sustainable agricultural development 2030 (1), therefore, work must be done to increase the rates of self-reliance in providing these commodities.

Study Problem:

The problem of the study is represented in the production deficit of the corn crop, which amounted to about 8543 thousand tons, which represents 50% of meeting the consumer needs, which amounted to 17,086 thousand tons in 2018, which prompted the state to fill the deficit by importing from abroad and carrying hard currencies.

Purpose of the study

The study aims to identify Egypt's imports of grain, especially yellow maize, Egypt's import map of the most important exporting countries, the sufficiency rate and the average per capita share of maize during the period (2005-2018), the monthly prices of the maize crop at the global and local levels, a study of the indicators of the equality price matrix for imports of yellow corn.

Research method and data sources:

The study relied mainly on two sources of data, the first: preliminary data for a sample of agricultural grain retailers in the Sharkia countryside, numbering 20 traders, and the second: published and unpublished data from its various sources, such as the Central Administration of Agricultural Economics at the Ministry of Agriculture and the Central Agency for Public Mobilization and Statistics. The data available on the Internet of the Food and Agriculture Organization of the Organization, in addition to some scientific messages, studies and economic research, periodicals and Arab and foreign references related to the subject of the research. As well as the imports of the corn crop in Egypt, as well as the quantitative analysis in calculating the nominal and effective protection coefficients and rates, and some other indicators through the estimation and analysis of parity prices for corn imports and some statistical measures necessary to achieve the objectives of the study.

Results
First: Egypt's imports of grain crops in 2020

The results of Table (1) indicate that the wheat crop ranked first in Egypt's imports of grains, with a value of 2,693.85 million dollars, representing 58.2%, followed by the corn crop in the second place, with a value of 1880.8 million dollars, representing 40.6%, and then the rice crop in third place, with a value of 46.67 One million dollars, representing 1%, and finally (buckwheat, millet, canary seeds and other grains, barley, wheat germ, sorghum, oats) with a value of 6.32 million dollars, representing 0.14%, of the total value of Egypt's imports of grain crops, which amounted to 4627.7 million dollars in 2020 .Figure (1).

Table (1): The relative importance of Egypt's imports of grain in 2020

Item	Imports million dollars	%
Wheat	2693.85	58.2114
Corn	1880.86	40.6436
Rice	46.67	1.0084
Other Pills	3.49	0.0755
Barley	1.58	0.0342
Wheat Germ	0.76	0.0165
Fine Corn	0.47	0.0100
Oats	0.02	0.0004
Total	4627.701	100

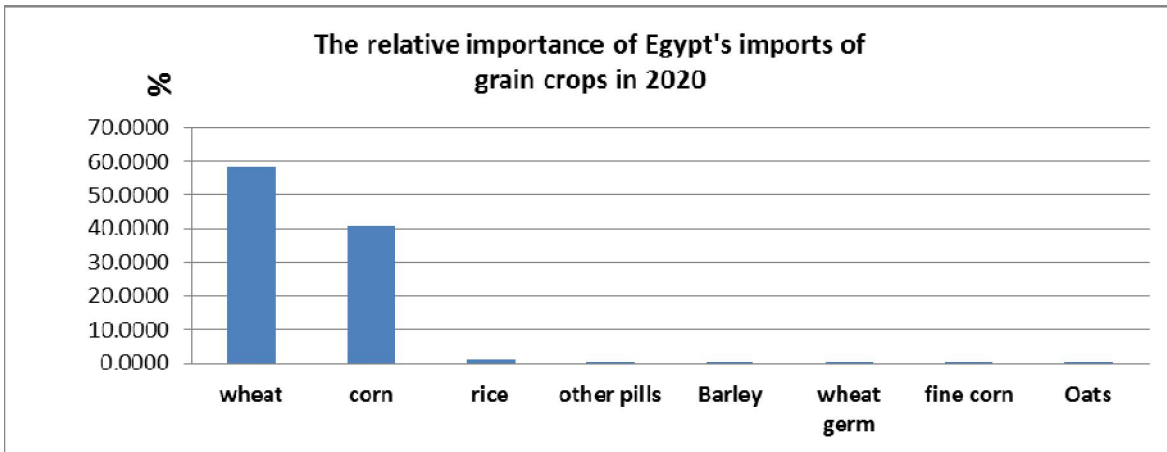**Source:** https://creativehype.org/news

Figure (1): The relative importance of Egypt's imports of grain crops in 2020
Source: Table (1)

Second: Countries importing yellow corn in the world in 2020

Data in Table (2) indicate that Japan ranked first in the world's importing countries for corn, with a value of about 3.3 billion dollars, representing 21.2, followed by Mexico in the second place, with a value of 3.1 billion dollars, representing 19.9%, and then China in the third place, with a value of 2.5 billion dollars, representing 16.1%. Vietnam ranked fourth with a value of $2.4 billion, representing 15.4 percent, South Korea ranked fifth with a value of $2.37 billion, representing 15.2 percent, while Egypt ranked sixth and last with a value of $1.9 billion, representing 12.2%, out of the total value of maize imports worldwide, which amounted to $15.57 billion in 2020, figure (2)

Table (2): The relative importance of the world's corn-importing countries in 2020

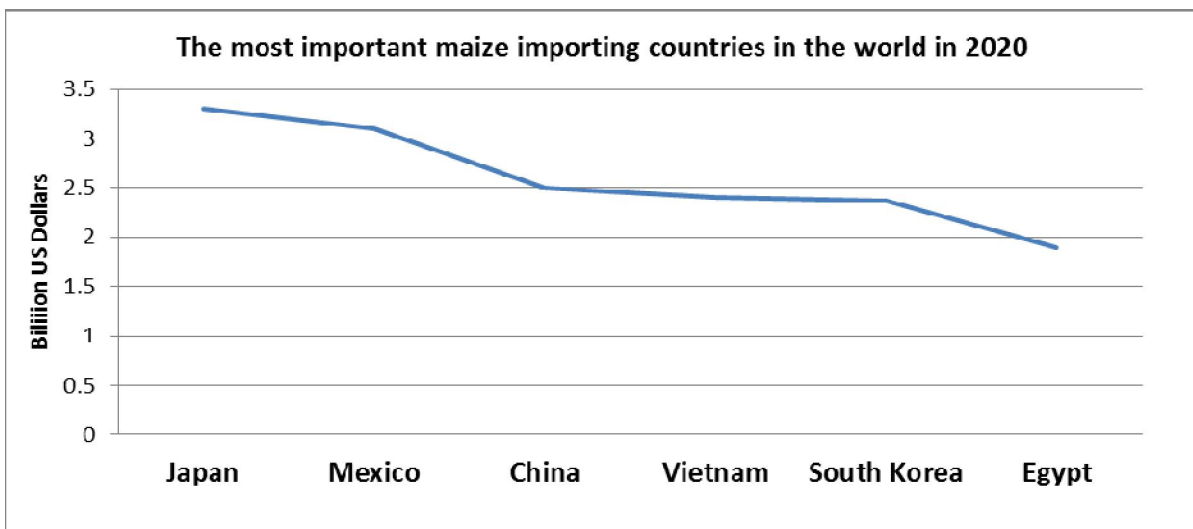| Country	Value (billion US dollars)	%
Japan	3.3	21.2
Mexico	3.1	19.9
China	2.5	16.1
Vietnam	2.4	15.4
South Korea	2.37	15.2
Egypt	1.9	12.2
Total	15.57	100

https://creativehype.org/news **Source:**

Figure (2): The most important maize importing countries in the world in 2020
Source: Table (2)

Third: The relative importance of the quantity and value of Egyptian imports of the corn crop in the year 2020

The results of Table (3) indicate that Argentina ranked first for Egyptian imports of corn with a quantity of 8.507 million tons, representing 50%, and a value of 731.5 million dollars, representing 38.9%, while Ukraine ranked second with a quantity of 3.312 million tons, representing 19.5%. With a value of 491.6 million dollars, representing 26.1%, while Brazil came in third place with a quantity of 2.225 million tons, representing 13.1%, with a value of 477.2 million dollars, representing 25.4%, then Romania ranked fourth with a quantity of 2.160 million tons, representing 12.7%, with a value of 113.4 million dollars, representing 6%, and Serbia ranked fifth, with a quantity of 0.513 million tons, representing 3%, with a value of 39.5 million dollars, representing 2.1%, and in the sixth place, the United States, with a quantity of 0.178 million tons, representing 1.1%, with a value of 14 million dollars, representing 0.7%, Seventh place is Belgrade, with a quantity of 0.061 million tons, representing 0.4%, with a value of 9.5 million dollars, representing 0.5%. The eighth place is Thailand, with a quantity of 0.43 million tons, representing 0.25%, with a value of 1.3 million dollars, representing 0.1%. Then the rest of the exporting countries (Moldova - Spain - Turkey - Russia - Haiti - Italy - Taipei - India - Greece) in quantity It reached 11.6 million tons, representing 0.07%, with a value of 2.6 million dollars, representing 0.1%, of the total amount of Egyptian imports of maize, which amounted to 17.015 million tons, valued at 1.880 million dollars in 2020. Figure (3)

Table (3): The relative importance of the quantity and value of Egyptian imports of maize in the year 2020

Country	Quantity in tons	%	Value in thousands of dollars	%
Argentina	8,507,975	50.0	731,521	38.9
Ukraine	3,312,130	19.5	491,628	26.1
Brazil	2,225,956	13.1	477,249	25.4
Romania	2,160,855	12.7	113,445	6.0
Serbia	513,646	3.0	39,474	2.1
United State	178,726	1.1	14,046	0.7
Belgrade	61,588	0.4	9,518	0.5
Thailand	43,094	0.25	1,340	0.07
the rest of the countries	11,648.0	0.07	2,641	0.14
Total	17,015,618	100.0	1,880,862	100.0

https://creativehype.org/news **Source:**
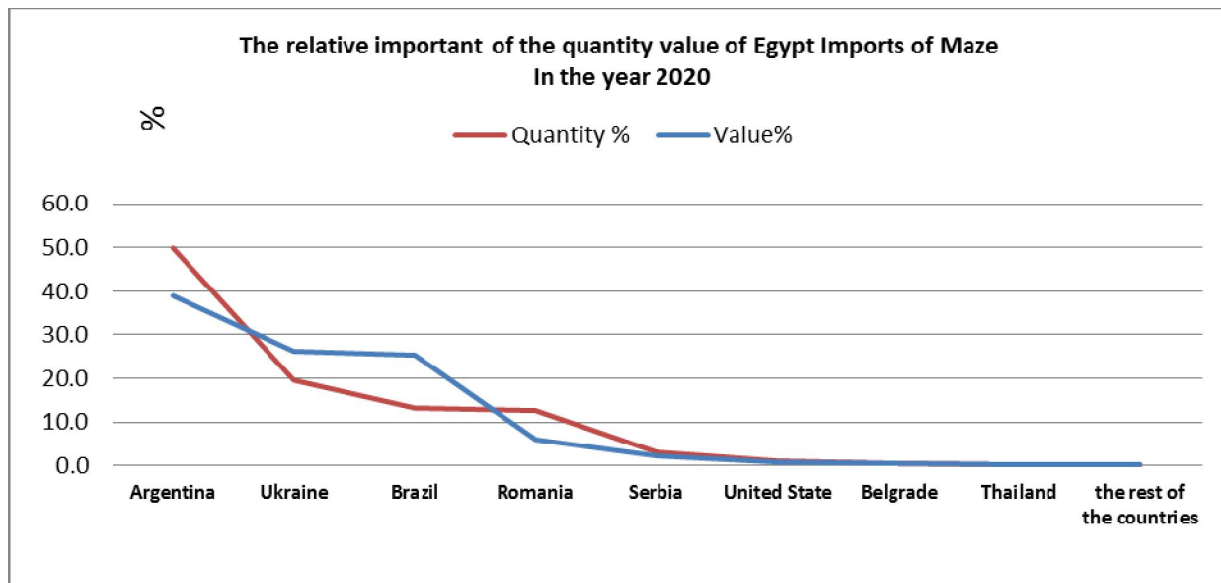
Figure (3): The relative importance of the quantity and value of Egyptian imports of maize in the year 2020
Source: table(3)

Fourth: The production and import map of the yellow corn crop from the most important countries in the world in 2020

The data in Table (5) indicate the production and import map of the corn crop and that the production of the corn crop in Egypt is during the months of September and November, while in Argentina the production is during the months of March, April, May and June, while in Romania the production is during the months of September, October and November, Brazil the crop is produced During two overlapping periods starting from January and continuing until September (9 months), and finally Ukraine is produced during the months of September, October and November.

The map also shows that the months of importing the corn crop from Argentina are during the months of April to December with a period of 9 months, while in Romania the import takes place during the months of July until December with a period of 6 months, while Brazil is imported during the months of January, February, March and April with a period of 4 months, Ukraine Imports take place during the period from April to December with a period of 9 months, and finally America, from which imports take place during the months from January to May with a period of 5 months

Table (5) The production and export map of the most important countries exporting the yellow corn crop to Egypt in 2020

Country	Season	January	February	March	April	Mayo	June	July	August	September	October	November	December
Egypt	months of production									🟩	🟩		
Argentina	months of production			🟩	🟩	🟩	🟩						
Argentina	months of import				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
Romania	months of production									🟩	🟩	🟩	
Romania	months of import							🟥	🟥	🟥	🟥	🟥	🟥
Brazil	months of production	🟩	🟩	🟩	🟩								
Brazil	months of production					🟩	🟩	🟩	🟩				
Brazil	months of import	🟥	🟥	🟥	🟥				🟥	🟥	🟥	🟥	🟥
Ukraine	months of production									🟩	🟩	🟩	
Ukraine	months of import				🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥	🟥
America	months of production									🟩	🟩	🟩	
America	months of import	🟥	🟥	🟥	🟥	🟥							

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Food Balance Bulletin, separate issues.

Fifth: The self-sufficiency rate and the average per capita share of the corn crop in Egypt during the period (2005-2018)

The area planted with corn: the data indicate that the area planted with corn in Egypt reached the lowest, 1482 thousand faddan in 2011, while the highest reached 2,525 thousand faddan in 2015, with an average of 2082.5 thousand faddan, and a standard deviation of 297.6 thousand faddan, and an increasing annual growth rate of 1.4 % during the same period.

- Production of the corn crop: the data indicate that the quantity produced from the corn crop in Egypt amounted to the lowest of 6788 thousand tons in 2012, while the highest amounted to 8543 thousand tons in 2018, with an average of 7566.4 thousand tons, with a standard deviation of 482.3 thousand tons, and an increasing annual growth rate of 0.7% during the same period, Fig. (5).

- Consumption of the corn crop: the data indicate that the quantity consumed of the corn crop in Egypt was the lowest at 9317 thousand tons in 2009, while the highest amounted to 17,086 thousand tons in 2018, with an average of 13,102 thousand tons, with a standard deviation of 2,217 thousand tons, and an increasing annual growth rate of 2.1% during the same period, Figure (5).

- The rate of self-sufficiency of the corn crop: the data indicate that the rate of self-sufficiency of the corn crop in Egypt was the lowest at 48% in 2012, while it reached the highest at 79% in 2009, with an average of 57.9%, with a standard deviation of 8.7%, and a decreasing annual growth rate of - 1.3% during the same period, Figure (6)

- Average per capita corn yield: The data indicate that the average per capita corn crop was the lowest at 82.11 kg/year in 2017, while the highest was 108.93 kg/year in 2005, with an average of 92.6 kg/year, and a standard deviation of 297.6 kg/year , with a decreasing annual growth rate of -1.5% during the same period, Figure (6).

- The farm price of the corn crop: the data indicate that the farm price of the corn crop in Egypt reached the lowest at 1036 pounds/ton in 2005, while the highest was 3284 pounds/ton in 2017, with an average of 1977 pounds/ton, and with a standard deviation of 633.3 pounds/ton, with an average of An annual growth rate of 7% during the same period, Figure (6).

The world price of corn: the data indicate that the world price of corn reached the lowest of 133 dollars / ton in 2005, while the highest was 438 / ton in 2009, with an average of 223.6 dollars / ton, and a standard deviation of 82.5 dollars / ton, with an increasing annual growth rate It reached 1.3% during the same period, Figure (7).

- Equivalent price of maize crop: the data indicate that the price equivalent to the world price of maize crop reached the lowest of 768 pounds / ton in 2005, while the highest was 2749 pounds / ton in 2017, with an average of 1737.4 pounds / ton, and a standard deviation of 624.6 pounds / ton, with an average An annual growth rate of 9.3% during the same period, Figure (7).

- The exchange rate of the pound/dollar: the data indicate that the exchange rate of the pound against the dollar was the lowest at 5.45 pounds/dollar in 2008, while the highest was 18.35 pounds/dollar in 2017, with an average of 8.1 pounds/dollar, and a standard deviation of 4.4 pounds/dollar, with an average An increasing annual growth of 8.43% during the same period.

Table (6): Production, consumption, self-sufficiency ratio, world and farm prices, and average per capita share of the yellow maize crop in Egypt during the period (2005-2018)

Years	The area is thousand Fadden	production of a thousand tons	Consumption of a thousand tons	% self-sufficiency	Average per capita kg/year	farm price pounds/ton	World price* in dollars/ton	Equivalent price EGP/ton	Exchange rate pound/dollar
2005	1927	7698	12818	60	108.9	1036	133	768	5.78
2006	1915	6909	10656	65	95.2	1079	148	850	5.74
2007	1905	6930	11399	61	93.8	1586	211	1193	5.64
2008	1912	7401	12519	59	98.4	1414	236	1284	5.45
2009	1957	7401	9317	79	96.3	1393	438	2430	5.55
2010	1998	7686	12509	61	97.6	1871	253	1436	5.68
2011	1482	7183	14073	51	89.3	1929	306	1826	5.97
2012	1839	6877	15155	45	83.7	2164	274	1885	6.14
2013	2139	7957	14257	58	95.7	2243	276	1958	7.15
2014	2474	8060	10557	65	91.7	2264	200	1593	7.09
2015	2525	7803	12814	54	90.6	2300	183	1482	7.83
2016	2446	7818	13961	56	85.7	2449	159	2197	8.88
2017	2300	7663	16304	47	82.1	3284	154	2749	18.35
2018	2336	8543	17086	50	87.9	2666	160	2672	17.79
Minimum	1482	6877	9317	45	82.11	1036	133	768	5.45
Maximum	2525	8543	17086	79	108.93	3284	438	2749	18.35
Mean	2082.5	7566.4	13102.0	57.9	92.6	1977.0	223.6	1737.4	8.1
Std .Deviation	297.6	482.3	2217.0	8.7	7.0	633.3	82.5	624.6	4.4
annual growth rate	1.4%	0.7%	2.1%	-1.3%	-1.5%	7.0%	1.3%	9.3%	8.4%

Source: Ministry of Agriculture and Land Reclamation, Economic Affairs Sector, Food Balance Bulletin, separate issues.
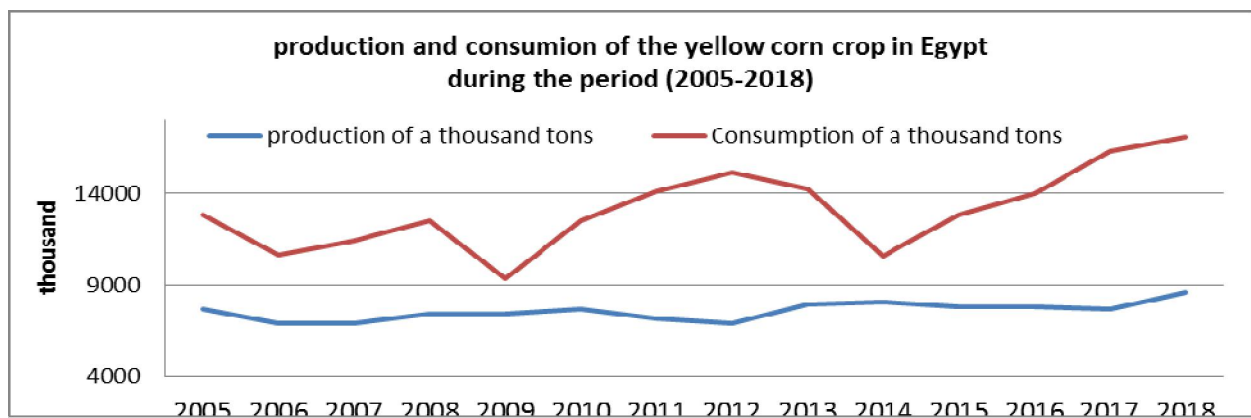

Figure (5) Production and consumption of the yellow corn crop in Egypt
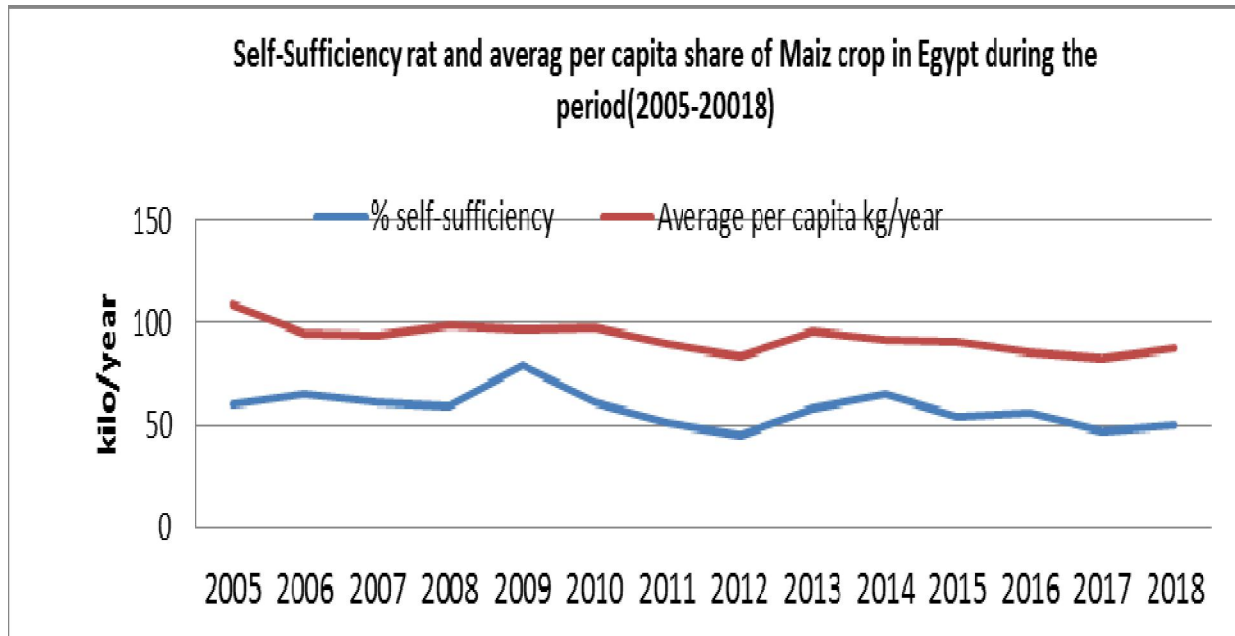Source: table(6)

Figure (6) Self-sufficiency rate and average per capita share of maize crop in Egypt during the period (2005-2018)
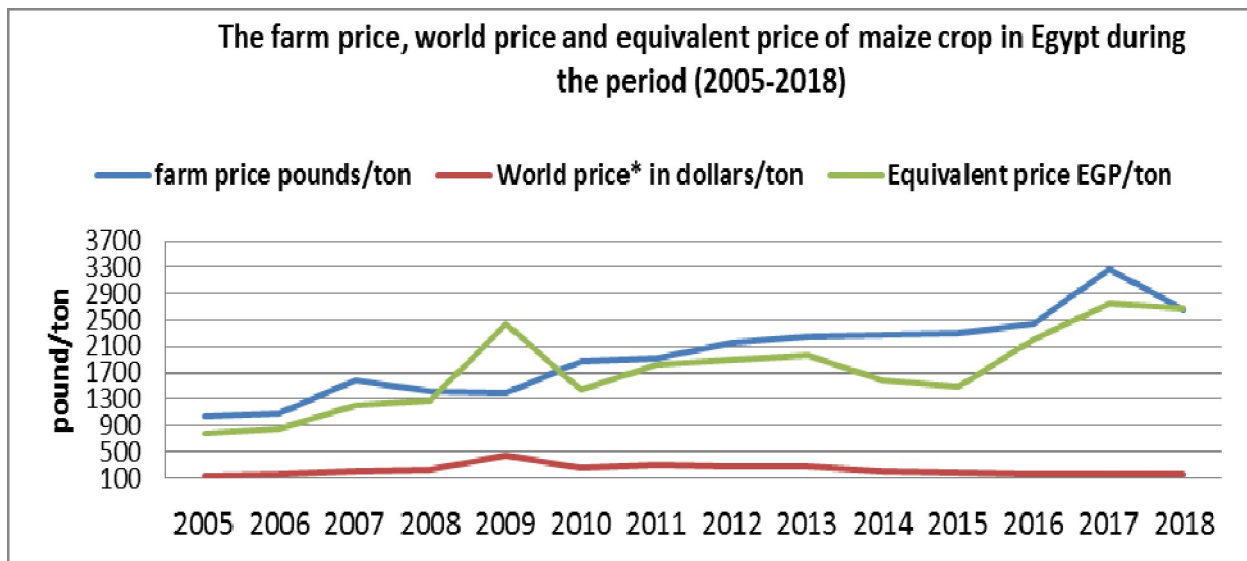Source: table(6)

Figure (7): The farm price, world price and equivalent price of maize crop in Egypt during the period (2005-2018)
Source: table(6)

Sixth: The monthly global prices of yellow maize

The data in Table (7) indicate that the monthly global prices of corn reached their maximum during the months (October, November and December) about 186.75, 190.38, 198.03 dollars / ton, respectively, while the lowest during the months (April, May, June and August) reached about 146.91, 143.91, 147.99 , 143.71 dollars / ton, respectively, and since the equality price analysis for corn imports depends on calculating an average price for the whole year, the average world price for corn imports was 165 dollars / ton for the year 2020. Figure (8)

Table (7): Average monthly global prices of yellow maize in 2020

Months	World price (dollars/ton	Deviation from mean	%
January	171.79	6.7875	4.1
February	168.71	3.7075	2.2
March	162.42	-2.5825	-1.6
April	146.91	-18.0925	-11.0
Mayo	143.91	-21.0925	-12.8
June	147.99	-17.0125	-10.3
July	152.55	-12.4525	-7.5
August	143.71	-21.2925	-12.9
September	166.14	1.1375	0.7
October	186.75	21.7475	13.2
November	190.38	25.3775	15.4
December	198.77	33.7675	20.5
average	165.0025	0	0.0

Source: Ministry of Trade and Industry, Information Systems and Digital Transformation Sector, Central Administration for Statistics, Reports and Electronic Publishing, Monthly Report, Price Trends of the Most Important International Commodities, Various Issues
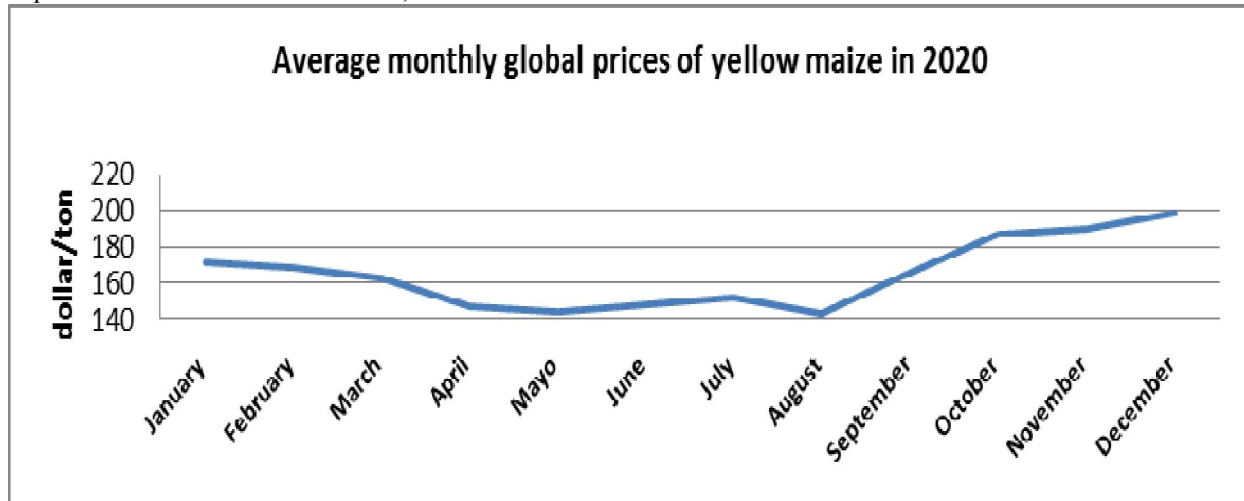

Figure (8) Average monthly global prices of yellow maize in 2020
Source: table(7)

Seventh: Analysis of the price policy for yellow maize imports

In the next part, the economic effects are studied, which include subsidizing or not supporting, as well as direct and indirect taxes for importing corn, by analyzing the matrix of parity prices for imports of corn, where the matrix of parity prices for imports is defined as a quantitative analysis or an arithmetic framework that helps in segmenting the system The price of the imported commodity into its basic components (domestic resources, tradable inputs, and remittances) measured at private prices, and social or shadow prices*. Several indicators can be deduced that show the extent of protection or imposed taxes, through which it is possible to judge the extent of subsidizing corn imports or imposing direct or indirect taxes upon import, as well as for producers, whether through the official (private) or social exchange rate (border or shadow price) .

The results of Table (8) indicate that the equality price of corn imports in 2020 at the special price (the central bank price) amounted to 3683.55 g/ton, of which 84% of the components of this price are commercial resources, 12% of the components of this price are domestic resources, and 0.04% are transfers , which means that the price will be sword in the ports of arrival in Egypt, which is related to both the Egyptian exchange rate and the international price of corn imports, port losses, and the cost of transportation from the port to warehouses and which is related to the average transportation cost, they affect by 84% of the price of imported corn, while each of the handling expenses affects, customs clearance, and marketing costs by 12% in the price of imported corn, and only 0.04% for remittances.

The results show that the equality price of corn imports at the social price (free market price) amounted to 3845.99 g/ton, a difference of 162.44 g/ton from the private equality price, of which 88% of the components of this price are commercial resources, and 12% of the components of this price are domestic resources, which is what It means that the price is a sword in the ports of arrival in Egypt, which is related to both the Egyptian exchange rate and the international price of corn imports, as well as port losses, and the cost of transporting from the port to warehouses and related to the average transportation cost affect 88% of the price of imported corn, while handling and clearance expenses affect Customs duties, and the marketing cost of 12% in the price of imported corn.

Maize import matrix analysis

1- Transfers of local (non-tradable) elements amounted to -7.46 pounds (the special cost of local resources - the social cost of local resources), and it explains transfers that result from the difference between the actual (private) price and the social (shadow or border) price of local inputs. If the value is positive, this means that there is support for local inputs or components, and if the value is negative, this means that there is no real support for local elements and the presence of direct or indirect taxes. Since the value is negative, this means that there are taxes on local inputs

2- Transfers of commercial resources (tradable) amounted to -312.32 pounds, the special cost of commercial resources - the social cost of commercial resources), which explains transfers that result from the difference between the actual (special) price and the social price (shadow or border) for traded inputs and if the value is positive This means that there is a subsidy for the inputs or commercial items, and if the value is negative, this means that there are direct or indirect taxes for the commercial items. Since the value is negative, this means that there are taxes on commercial inputs.

3- Net transfers 15.86 pounds, calculated by (transfers of commercial resources - transfers of local elements), which explains transfers that result from the difference between transfers of commercial elements and transfers of local elements. Since the value is positive, this means that the overall effect of government intervention policies is in favor of the importer in the short term .

4- The nominal protection coefficient was 0.96 and is calculated by (private parity prices / social parity prices), and it explains three possibilities, the first of which is if the value is greater than the correct

one, then this means the existence of a subsidy policy, and the second, if it is less than the correct one, this means the imposition of taxes Directly or indirectly on importers, and the third was equal to the correct one, this means a neutral policy. Since the value is less than the correct one, this means that there are direct or indirect taxes on the price of the commodity.

5- The nominal protection rate was -0.04 and is calculated by (the nominal protection factor -1), which explains the value of subsidies or taxes on the price of the commodity. And since the value is negative, it means the value of taxes, whether direct or indirect, amounting to 0.04 on the price of the commodity.

6- The nominal protection coefficient of commercial inputs was 0.91 and is calculated by (the value of the cost of commercial inputs in the private / the value of the cost of the commercial inputs in the social), and it explains three possibilities, the first of which is if the value is greater than the right one, then this means that there is a support policy, and secondly, if it is less than The correct one, this means imposing direct or indirect taxes on importers, and thirdly, if they are equal to the correct one, then this means a neutral policy. Since the value is less than the correct one, this means taxes on commercial inputs.

7- The nominal protection rate of trade inputs was -0.09 and is calculated by (the nominal protection factor of trade inputs -1), which explains the value of subsidies or taxes on trade inputs in goods. Since the value is negative, it means the value of direct or indirect taxes on trade inputs.

8- The effective protection factor amounted to 1.33 and is calculated by ((the private price per ton of fertilizer - costs per ton of commercial inputs at special prices) / (the social price per ton of fertilizer - costs per ton of commercial inputs at social prices)), and it explains the ratio between the value added at special prices and the prices of (Social) limits and if the value is greater than the correct one, this means that there is a positive and motivating effect of the current policy on the importers, but if it is less than the correct one, this means that there is a negative and discouraging effect of the current policy on the importers, and if it is equal to the correct one, this means a neutral policy. Since the value is greater than the correct one, this means a stimulating effect for importers

9- The effective protection rate was 0.33 and is calculated by ((the effective protection factor -1), which explains the value of the subsidy or taxes. Since the value is positive, the subsidy has reached 0.33

10- The importer's subsidy ratio 3.92 Explains the value of the subsidy ratio provided to the importer and is calculated by the ratio of the total effect of the price policy in relation to the social price (net transfers) of the total social price

Price indicators and their economic interpretation from the results of the equality price matrix

The results of the price indicators table (9) and the economic interpretation thereof from the results of the equality price matrix indicate the presence of direct or indirect taxes on each of the local inputs and trade resources included in the items of the equality price formation, where the transfers of local elements and transfers of commercial resources appear with negative values Despite this, the overall effect of government intervention policies was in favor of importers in the short term, as the value of net transfers appeared with a positive value. The results of the table indicate the presence of direct or indirect taxes on the price of imported corn, and the tax rate was 0.04. The results also show the presence of taxes Directly or indirectly on commercial inputs at a tax rate of 0.09, despite this, it was found that there was a stimulating effect for importers with a support rate of 0.33, and the importer's subsidy rate was 3.92.

Eighth: Distribution of the consumer's pound for the yellow corn crop

Data in Table (10) show that the import price of maize amounted to 3.68 pounds / kg, representing 0.51%, while consumer prices amounted to 7 pounds / kg during the period from January to June, and then increased to 7.5 pounds / kg during the months of July to December , with an average of 7.25 pounds / kg, and the difference between them shows the margins and marketing costs borne by the consumer during the months of the year, where the lowest amounted to 3.82 during the months of January to June, while the highest amounted to 3.82 pounds / kg during the months of July to December, with an average of 3.57 pounds / kg, representing 0.49% The importer's margin reached between a minimum of 1.57 pounds/kg and a maximum of 2.33 pounds/kg with an annual average of 1.89 pounds/kg, representing 0.26%, while the wholesaler's margin amounted to about 0.55 pounds/kg, representing 0.08%, and finally the retailer's margin was The lowest amounted to 0.93 pounds/kg, while the highest reached about 1.39 pounds/kg, with an average of 1.13 pounds/kg, representing 0.16%, from the average consumer prices for yellow corn, which amounted to 7.25 pounds/kg. This indicates what the consumer bears about twice the import price of the crop. From the outside. Figure (9).

Table (8): the equality price matrix for Egyptian imports of yellow maize in 202

clause	Unit	Corn imports						
		The price (special), which is the official price, the central bank rate				The price (social) is the shadow price (the free market price)		
		Total	tradable	Not tradable	Transfers	Total	tradable	Not tradable
exchange rate*	pound / dollar	15.77				15.75		
average global price	dollar/ton	165				165		
Price CIF port of arrival	pound / ton	2602.1	2602.1			2598.8	2598.8	
Handling charges*	pound / ton	21.90		21.90		21.88		21.88
Clearance Expenses*	pound / ton	27.78		27.78		27.78		27.78
The cost on the port land	pound / ton	2651.7	2602.1	49.681		2648.4	2598.8	49.653
wastage	pound / ton	2.65	2.652			2.648	2.65	
Cost out of port	pound / ton	2654.38	2604.7	49.681		2651.05	2601.4	49.65
Distance from port to warehouse	kilometer	157.33				157.33		
* Average transportation cost	Pound / ton / kilometre	1.77				1.77		
Port transportation cost to warehouse	pound / ton	277.78	166.67	55.56	55.56	333.33	277.78	55.56
Marketing Cost 7.5%	pound / ton	199.08		199.08		198.83		198.83
Cost in main stores	pound / ton	3131.24	2771.37	304.31	55.56	3183.21	2879.18	304.04
Distance from warehouses to farms and importers companies	kilometer	291				291		
The cost of transportation from warehouses to farms and importers companies	pound / ton	513.78	308.27	102.76	102.76	616.54	513.78	102.76
Marketing cost 7.5%	pound / ton	38.53		38.53		46.24		46.24
Equal price for corn imports	pound / ton	3683.55	3079.64	445.60	158.31	3845.99	3392.96	453.03
Equal price for corn imports	Pounds / kilograms	3.68				3.85		
Percentage	%	1	0.84	0.12	0.04	1	0.88	0.12

* Handling: $25 for a 20-foot container, a load of 18 tons = (25 * 15.77 for the individual) = 394.25 EGP / container =21.9 EGP / ton, because the container is 18 tons and the handling for the social = (25 * 15.75 for the social) = 393.75 EGP / container that is 21.88 EGP / ton

*Customs clearance: 1500 pounds for the customs message and the message 3 containers. The container has a load of 18 tons, the customs message is 54 tons. Therefore, customs clearance = (1500 / 54) = 27.78 EGP / ton

* Average Transportation Cost = (Truck Cost/Payload/Distance) = (5000 /18/157.33) = 1.77

Source: unpublished data from the Central Bank, A.R.E. ports, and transport companies.

Table (9) of price indicators and their economic interpretation from the results of the parity prices matrix

Price Index	Value	Economic explanation
1. Transfers of local (non-tradable) items	**7.46-**	It is calculated by (the private cost of local resources - the social cost of local resources), and it explains the transformations that result from the difference between the actual (private) price and the social (shadow or border) price of local inputs. If the value is positive, this means that there is support for local inputs or elements. If the value is negative, this means that there is no real support for domestic elements and the presence of direct or indirect taxes. Since the value is negative, this means that there are taxes on local inputs.
2. Transfers of trade resources (tradable)	**-312.32**	It is calculated by (the private cost of commercial resources - the social cost of commercial resources), and it explains the transfers that result from the difference between the actual (private) price and the social price (the shadow or border) of the traded inputs. If the value is positive, this means that there is support for the inputs or commercial elements, If the value is negative, this means that there are direct or indirect taxes for commercial items. Since the value is negative, this means that there are taxes on commercial inputs.
3. Net Transfers	**150.86**	It is calculated with (transfers of commercial resources - transfers of local elements), and it explains transfers that result from the difference between transfers of commercial elements and transfers of local elements. Since the value is positive, this means that the overall effect of government intervention policies is in favor of the importer in the short term.
4. Nominal protection factor	**0.96**	It is calculated with (private parity prices / social parity prices), and it explains three possibilities, the first of which is if the value is greater than the correct one, then this means the existence of a subsidy policy, and secondly, if it is less than the correct one, this means imposing direct or indirect taxes on importers, And the third was equal to the correct one, which means a neutral policy. Since the value is less than the correct one, this means that there are direct or indirect taxes on the price of the commodity.
5. Nominal protection rate	**0.04-**	It is calculated by (the nominal protection factor -1), which explains the value of the subsidy or taxes on the price of the commodity. And since the value is negative, it means the value of taxes, whether direct or indirect, amounting to 0.04 on the price of the commodity.
6. Nominal protection factor of trade inputs	**0.91**	It is calculated with (the value of the cost of commercial inputs in the private / the value of the cost of the commercial inputs in the social), and it explains three possibilities, the first of which is if the value is greater than the correct one, then this means the existence of a support policy, and secondly, if it is less than the correct one, this means the imposition of direct or indirect taxes Directly on the importers, and thirdly, if it is equal to the correct one, this means a neutral policy. Since the value is less than the correct one, this means taxes on commercial inputs.
7. Nominal protection rate for trade inputs	**0.09-**	It is calculated by (the nominal protection factor of trade inputs (-1), which explains the value of subsidies or taxes on trade inputs in goods. Since the value is negative, it means the value of direct or indirect taxes on trade inputs.
8. Effective protection factor	**1.33**	It is calculated by (((special price per ton of fertilizer - costs per ton of commercial inputs at special prices) / (social price per ton of fertilizer - costs per ton of commercial inputs at social prices)), and it explains the ratio between value added at special prices and (social) border prices. The value is greater than the correct one, this means that there is a positive and motivating effect of the current policy on the importers, but if it is less than the correct one, this means that there is a negative and discouraging effect of the current policy on the importers, and if it is equal to the correct one, this means a neutral policy. Correct, this means a stimulating effect for importers
9. Effective protection rate	**0.33**	It is calculated by ((the effective protection factor -1), which explains the value of the subsidy or taxes. And since the value is positive, the subsidy amounted to 0.33
10. Importer Subsidy Ratio	**3.92**	It explains the value of the subsidy ratio provided to the importer and is calculated by the ratio of the total impact of the price policy in relation to the social price (net transfers) of the total social price.

Source: The matrix of equal prices for Egyptian imports of corn was calculated from the data of Table (8).

Table (10) of the import price, consumer prices, wholesale and retail prices of corn in the year 2020

Statement	January	February	March	April	Mayo	June	July	August	September	October	November	December	average	%consumer
Import price EGP/kg	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	3.68	0.51
Consumer price EGP/kg*	7	7	7	7	7	7	7.5	7.5	7.5	7.5	7.5	7.5	7.25	100
Wholesale prices EGP/kg	5.3	5.3	5.3	5.3	5.3	5.3	5.6	5.6	6.0	6.0	6.0	6.0	5.57	0.77
Retail prices EGP/kg	5.86	5.8	5.82	5.83	5.84	5.84	6.11	6.16	6.53	6.56	6.55	6.57	6.12	0.84
Marketing Costs & Margins(1)	3.32	3.32	3.32	3.32	3.32	3.32	3.82	3.82	3.82	3.82	3.82	3.82	3.57	0.49
Importer Margin EGP/kg(2)	1.63	1.57	1.58	1.60	1.61	1.61	1.88	1.93	2.30	2.32	2.31	2.33	1.89	0.26
Wholesaler Margin Pound/Kg(3)	0.55	0.55	0.56	0.55	0.55	0.55	0.55	0.55	0.55	0.56	0.56	0.56	0.55	0.08
Retailer's margin pounds/kg(4)	1.14	1.2	1.18	1.17	1.16	1.16	1.39	1.34	0.97	0.94	0.95	0.93	1.13	0.16

* Preliminary data for a field sample of retailers.
(1) = consumer price - import price (2) = consumer price - wholesale price
(3) = wholesale price - retail price (4) = consumer price - retail price
Source: Central Agency for Public Mobilization and Statistics, Food Commodity Price Bulletin 2020
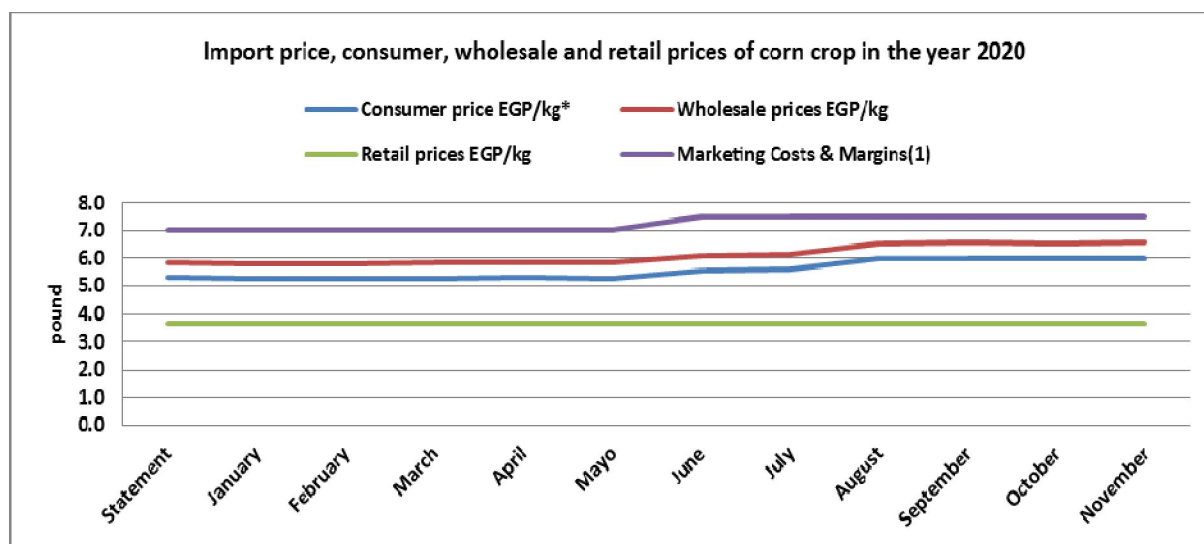

Figure (9) Import price, consumer, wholesale and retail prices of corn crop in the year 2020
Source: Table (10)

Summary and recommendations

Maize is one of the most prominent grain crops grown in Egypt in terms of economic and nutritional importance, as it enters into human and animal nutrition and is used in many diverse food industries. Therefore, the demand for maize increases with this increasing importance, and silage manufacturing is one of the most important uses of maize. Its importance in feeding animals in recent years, especially in the summer, when there is less green fodder needed to feed animals.

The problem of the study is represented in the production deficit of the yellow corn crop, which amounted to about 8543 thousand tons, which represents 50% of meeting the consumer needs, which amounted to 17,086 thousand tons in 2018, which prompted the state to fill the deficit by importing from abroad and bearing hard currencies.

The study aims to identify Egypt's imports of grains, especially yellow corn, Egypt's import map of the most important exporting countries, the sufficiency rate and the average per capita share of maize during the period (2005-2018), the monthly

prices of the maize crop at the global and local levels, a study of the indicators of the equality price matrix for imports of yellow corn.

The data indicate that the area planted with corn in Egypt reached the lowest of 1,482 thousand faddan in 2011, while the highest amounted to 2,525 thousand faddan in 2015, with an average of 2,082.5 thousand faddan, and an increasing annual growth rate of 1.4% during the period (2005-2008), and that the percentage of sufficiency The endogenous corn crop reached the lowest at 48% in 2012, while it reached the highest at 79% in 2009, with an average of 57.9%, with a decreasing annual growth rate of -1.3%, and the average per capita share of the corn crop was the lowest at 82.11 kg/year in 2017, while The highest amounted to 108.93 kg/year in 2005, with an average of 92.6 kg/year, and a decreasing annual growth rate of -1.5% during the same period. The data indicate that the price equivalent to the world price of corn crop reached the lowest at 768 pounds/ton in 2005, while the highest amounted to 2749 pounds. / ton in 2017, with an average of 1737.4 pounds / ton, with an increasing annual growth rate of 9.3% during the same period, and the corn crop ranked second in the Egyptian imports of agricultural grains after the wheat crop by 40.6%, and ranked sixth globally with a value of 1.9 billion dollars, representing 12.2 This is from the total value of corn imports, which amounted to $15.57 billion in 2020.

The results also indicate that the value of trade resource transfers is negative, reaching -313.29, which means that there is no real support for commercial inputs, and the value of local resource transfers is negative - 7.46, which means that there is no real support for local inputs. As for the value of net positive transfers, 150.86, it indicates that the effect The total of all government intervention policies is positive, i.e. in favor of the importer in the short term, as evidenced by the results of the nominal protection coefficient of 0.96, which explains the extent of government intervention (whether by providing subsidies or imposing taxes) in the prices of goods and if local prices are lower or higher than international prices, and the rate of Nominal protection of commercial inputs - 0.4, which explains the extent of government intervention (whether by providing subsidies or imposing taxes) in the market prices of commercial inputs, and if local prices are lower or higher than international prices, indicating that they are less than the correct one, and this means that there is no support for the price of imported corn The presence of direct or indirect taxes on the price and the price of traded inputs.

As for the effective protection coefficient, which amounted to 1.33, it shows whether the total effect of the policy adopted is negative (disincentive) or positive (stimulating) for importers. The indicator showed the existence of a motivating policy for importers, despite the presence of direct or indirect taxes on commercial and local inputs and importers in general, but that The general price policy is stimulating to them, and the import subsidy ratio is 3.92.

The study recommends:
1- The need for the state to work on importing its maize needs without relying on the private sector
2- Adopting a marketing policy that ensures that consumers obtain their needs of yellow corn at the lowest price and the highest efficiency
3- Increasing the cultivated areas of the crop and relying on modern, high-yield and high-protein varieties
4- Activating contract farming to ensure the marketing of the crop to farmers, increase the cultivated area and reduce imported quantities
5- Building storage silos to achieve food security and provide a strategic reserve for the state.

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Appendix

Table (1) Items of the matrix of parity prices for imports of Egyptian corn in 2020

Prices in social	Prices in private
1. Exchange rate = the free or parallel exchange rate of pounds / dollars, which amounted to 15.75 pounds / dollars as a free or parallel rate (the social rate or the shadow price).	1. Exchange rate = the official exchange rate of EGP/Dollar, which was calculated as the average exchange rate for the year 2020, which amounted to EGP 15.77/USD as the official rate in the Central Bank (the special rate).
2. The average world price = the price of imported corn, which amounted to 165 dollars / ton.	2. Average world price = which was calculated as the average world price of corn during the months of the year, which amounted to 165.dollars/ton.
3. Price CIF at the port of arrival in Egypt = (free exchange rate * average world price), which amounted to 2598.75 EGP / ton, and is tradable.	3. The price is CIF at the port of arrival in Egypt = (exchange rate * average world price), which amounted to EGP 2,602.05 / ton and is negotiable.
4. Handling expenses according to handling prices in Egyptian ports in 2020, which amounted to 25 dollars for a 20-foot container, a load of 18 tons, with a total of 393.75 pounds / container, 21.88 pounds / ton, all of which are not tradable.	4. Handling expenses according to handling prices in Egyptian ports in 2020, which amounted to 25 dollars for a 20-foot container, a load of 18 tons, with a total of 394.25 pounds / container, 21.9 pounds / ton, all of which are not tradable.
5- Customs clearance expenses, which vary from one company to another, but as an average for the year 2020, it amounted to 1500 pounds for the customs message, which includes 3 containers, each 20 feet, a load of 18 tons, with a total of 54 tons, 27.78 pounds / ton, which is not tradable.	5. Customs clearance expenses, which vary from one company to another, but as an average for the year 2020, it amounted to 1500 pounds for the customs message, which includes 3 containers each of 20 feet, a load of 18 tons, with a total of 54 tons, 27.78 pounds / ton, which is not tradable.
6- The cost on the port land = (the price of CIF (pounds / ton) + handling expenses + clearance expenses), tradable sword price, and non-tradable (handling expenses + clearance expenses), and when calculating the cost on the port land, it amounted to 2651.73 pounds / ton Of this, 2602.05 pounds/ton is tradable, 49.68 pounds/ton is non-tradable	6. Cost on the port land = (CIF price (pounds / ton) + handling expenses + clearance expenses), tradable sword price, and non-tradable (handling expenses + clearance expenses), and when calculating the cost on the port land, it amounted to 2651.73 pounds / ton Of this, 2602.05 pounds/ton is tradable, 49.68 pounds/ton is non-tradable
7- The loss is calculated at a value of approximately 0.1% (pounds / ton) = (the cost on the port land * 0.001) amounted to 2.648 EGP / ton, which is tradable	7. The loss is calculated at a value of approximately 0.1% (pounds / ton) = (cost on the port land * 0.001) and it amounted to 2.65 pounds / ton, which is tradable
8- The cost outside the port (c / ton) = (cost on the port land + wastage), non-tradable (handling expenses + clearance expenses), and tradable the difference or the remainder after deducting handling and clearance expenses, and the cost outside the port amounted to 2651.05 as a total price Social (with a difference of 3.33 pounds / ton from the private price), of which 49.65 pounds / ton is not tradable, and 2601.4 pounds / ton are tradable.	8. The cost outside the port (pounds / ton) = (cost on the port land + wastage), (handling expenses + clearance expenses) is not tradable, but the tradeable is the difference or the rest after deducting handling and clearance expenses, and the cost outside the port amounted to 2654.38 pounds / ton, of which 49.681 pounds / ton is tradable, and 2604.7 pounds / ton is non-tradable.

9- The distance from the port to the warehouses (km) = the average distances from Port Said port, Suez port, and Alexandria port to Cairo, and by calculating the average distances from Port Said to Cairo 166 km, and from Suez to Cairo 125 km, and from Alexandria to Cairo 181 km, the average of the three distances is 157.33 How many .	9. The distance from the port to the warehouses (km) = the average distances from Port Said port, Suez port, and Alexandria port to Cairo, and by calculating the average distances from Port Said to Cairo 166 km, and from Suez to Cairo 125 km, and from Alexandria to Cairo 181 km, the average of the three distances is 157.33 How many .
10- Average transportation cost (g / ton / kg) = (truck cost / payload / distance), and by calculating the transportation cost rate, we find that it is 1.77 c / ton / km.	10. Average transportation cost (g / ton / kg) = (truck cost / payload / distance), and by calculating the transportation cost rate, we find that it is 1.77 c / ton / km.
11- The cost of transportation from the port to the warehouses (c / ton / km) = (the cost of transportation at special prices + its transfers), and the tradable is the cost of transportation in the private, and the non-tradable is the difference (the cost from the port to the warehouses - the transferable part trade), and by calculating the cost of transportation from the port to the warehouses at the social price, we find that it amounted to 333.33 g / ton, and the tradable part of it is 277.78 g / ton, and the non-tradable part is 55.56 g / ton.	11. The cost of transportation from the port to the warehouses (g / ton / km) = (average transportation cost * distance), which is 60% tradable, 20% non-tradable, and 20% transfers, calculating the transportation cost from the port to the warehouse At the special price, we find that it amounted to 277.78 g / ton, and the tradable part of it amounted to 166.67 g / ton, and the non-tradable part amounted to 55.56 g / ton, and the transfers amounted to 55.56 g / ton.
12- Marketing cost, which is calculated approximately at 7.5% (c/ton) = (cost outside the port * 0.057), and they are all non-tradable, and by calculating the marketing cost at the social price, we find that it is 198.83 c/ton.	12. The marketing cost is calculated approximately at 7.5% (c/ton) = (cost outside the port * 0.057), and they are all non-tradable, and by calculating the marketing cost at the special price, we find that it is 199.08 c/ton.
13- Cost in main stores (c / ton) = (cost outside the port + cost of transportation from the port to the warehouse + marketing cost), and the tradable is the sum of the tradable items in the three items in this equation, and the non-tradable is the sum of The non-tradable items in the three items in this equation, and by calculating the cost in the main stores at the social price, we find that it amounted to 3183.21 g / ton, and the tradable part of it amounted to 2879.18 g / ton, and the non-tradable part amounted to 304.04 g / ton.	13. Cost in main warehouses (c / ton) = (cost outside the port + cost of transportation from the port to the warehouse + marketing cost), and the tradable is the sum of the tradable items in the three items in this equation, and the non-tradable is the sum of The non-tradable items are in the three items in this equation, and the transfers are the sum of the transfers items in the three items in this equation, and by calculating the cost in the main stores at the special price, we find that it amounted to 3131.24 g / ton, and the tradable part of it amounted to 2771.37 g / ton, and the non-tradable part Tradable amounted to 304.31 g/ton, while the transfers account amounted to 55.56 g/ton.
14- The distance from the warehouses to the farm (km) = the average distances from Cairo to Lower Egypt and Upper Egypt, and by calculating the distances from Cairo to the east, 82 km, and from Cairo to Upper Egypt, 500 km, so the average distances are 291 km.	14. The distance from the warehouses to the farm (km) = the average distances from Cairo to Lower Egypt and Upper Egypt, and by calculating the distances from Cairo to the east, 82 km, and from Cairo to Upper Egypt, 500 km, so the average distances are 291 km.
15- The cost of transportation from warehouses to the farm (c / ton / km) = (the cost of transportation at special prices + its transfers), and the non-tradable from it is the same as the value of the non-tradable at special prices, and the tradable is the difference between them (total transportation cost - Non-tradable), and by calculating the cost of transportation from warehouses to the farm at the social price, it was found that it amounted to 616.54 g / ton / km, and the tradable part amounted to 513.78 g / ton / km, and the non-tradable part amounted to 102.76 g / ton / km.	15. The cost of transportation from warehouses to the farm (c / ton / km) = (average transportation cost * distance), which is tradable by 60%, non-tradable by 20%, and transfers by 20%, and calculating the cost of transportation from warehouses to The farm, we find that it amounted to 513.78 g / ton / km, and the tradable part of it amounted to 308.27 g / ton / km, and the calculation of the non-tradable part and transfers amounted to 102.76 g / ton / km each.

16- Marketing cost of 7.5% (c / ton) = (cost of transportation from warehouses to farm * 0.057), all of which are not tradable, and when calculating them at the special price, we find that they amounted to 46.24 c / ton.	16. Marketing cost of 7.5% (c/ton) = (cost of transportation from warehouses to farm * 0.057), and they are all non-tradable, and when calculating them at the special price, we find that they amounted to 38.53 c/ton.
17- Parity prices on the farm (c / ton) = (cost in the main stores + cost of transportation from stores to the farm + marketing cost 7.5%), and the tradable is the sum of the tradable items in the three items in this equation, and the non-tradable Including the total of the non-tradable items in the three items in this equation, and by calculating the parity prices at the social price, we find that it amounted to 3845.99 g / ton, and the tradable part of it amounted to 3392.96 g / ton, and the non-tradable part is 453.03 g / ton.	17. Equity prices on the farm (c/ton) = (cost in the main stores + cost of transportation from stores to the farm + marketing cost 7.5%), and the tradable is the sum of the tradable items in the three items in this equation, and the non-tradable Of which is the sum of the non-tradable items including the three items in this equation, and the transfers are the sum of the transfers items in the three items in this equation, and by calculating the parity prices at the special price, we find that they amounted to 3683.55 g / ton, and the tradable part of them amounted to 3079.64 g / ton, The non-tradable portion is 445.60 g/ton, and the transfers are 158.31 g/ton.
18- Equity prices on the farm (g/kg) = (equity prices on the farm (g/ton) / 1000), so it was 3.84 g/kg at the social price.	18. Equity farm prices (g/kg) = (equity farm prices (g/ton) / 1000) and therefore 3.68 pounds/kg at the private rate.
19- Percentage %: (total = 1), tradable = (tradable on the farm / total on the farm), and non-tradable = (non-tradable on the farm / total), and by calculating the percentage of the equality price at the social price, we find that 88 % of the price of imported corn was a tradable portion, and 12% of the price was nontradable.	19. Percentage %: (total = 1), tradable = (tradable on the farm / total on the farm), non-tradable = (non-tradable on the farm / total), remittances = (transfers on the farm / total), By calculating the percentage of the equality price at the private price, we find that 84% of the price of imported corn was a tradable part, 12% of the price was non-tradable, and 4% was transfers. +

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