The impact of agricultural policies in achieving food security, wheat and rice crops in Egypt and Morocco for the period

(1995-2020)

Aswan Abdel Qader Zidan

Amena Abdel elah ALhasoon Zahraa Moataz Mohamed Seddik

Department of Agricultural Economics - College of Agriculture and Forestry - University of Mosul

aswanzedan@uomosul.edu.iq

Summary

The issue of food security is one of the most important core issues that are receiving increasing attention for its economic, social and political impacts on the stability of countries. Therefore, these countries (Egypt, Morocco) have adopted a set of agricultural policies, and these policies are embodied in an integrated system of procedures and legislation enacted by the state in order to achieve renewed goals included in agricultural development plans. These goals often aim to increase agricultural production to achieve food security, and achieving the maximum degree of self-sufficiency. The analysis was done using the Eviews 10 program and the multiple linear regression method , a number of important tests were used to detect the unit root in time series, as well as the Phillips-Peron test, which takes into account errors with heterogeneous variance and integration test. In both (Egypt and Morocco), in addition to the weak policies followed in the aforementioned countries, so there are a number of proposals to reduce the gap, which is to rely on scientific methods in preparing production plans in order to achieve the set goals and reach self-sufficiency for these crops and then achieve food security in those countries.

key words: agricultural policy, Phelps-Beron test, unit root test .

Introduction

Agricultural policy is described as a set of laws related to local agriculture and imported agricultural products from abroad. Governments usually apply these agricultural policies with the aim of achieving specific results at the level of local markets for agricultural products. Among these results, ensuring the achievement of a constant level of supplies, stability in prices, quality of products and product selection. If the agricultural policy is a program that includes how to deal with the agricultural sector in the short and long term, it varies from one region to another and from one period of time to another, and the political market mechanisms directly or indirectly affect the changes and differences in policy. This imbalance is evident between the developed and developing countries. In the developed countries where the political weight of farmers is increasing, we find that agricultural policies are shifting from the stage of exploiting agriculture to protecting it, by encouraging abundant production for export. As for the developing countries, they prefer import at the expense of export and seek to The development of the industrial sector at the expense of the agricultural sector, so the problem of food security appears as This problem is considered one of the most serious problems facing the Arab countries without exception, especially with regard to grains (wheat, rice)Therefore, these policies give priority in their plans in terms of food security for these two crops, and there are many studies that dealt with this subject, including the study, which dealt with the elements of Arab food security, the policies adopted by Arab countries in order to

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provide food to the Arab citizen, and the relationship of increasing global prices The study concluded that addressing the issue of food security is difficult because there are many front and back linkages between the various economic activities[1]. Khairy and Hashem, 2014,also indicated in their study, which aimed to study the reality of food security and the food gap in different Arab countries, as the food crisis represents the most threat to the stability of the international community. and fuel) at subsidized prices from the state, continuing to buy agricultural crops from farmers at encouraging prices, and adhering to the principle of protecting agricultural products by imposing customs taxes on imported goods.

As the researchers [4] emphasized in their study to analyze agricultural policies in strategic grains in Egypt, the most prominent economic policies that help develop the agricultural sector. The study aimed to estimate the Egyptian agricultural policies analysis matrix for the most important strategic crops in Egypt, such as wheat and maize. The results where the nominal protection coefficient of the products was about (0.86) and (0.63) for each of wheat and maize, respectively, during the period(1996-2013) Finally, the research concluded that there is a comparative advantage for crop production during the mentioned period and that the coefficient was less than one.

Research problem

The research problem stems from the food security situation, which is considered one of the main economic problems that agricultural policies were concerned with, especially the countries that were characterized by being importers of some strategic grain crops (wheat, rice), which led to the widening of the food gap with time for both Egypt and Morocco .

Research Objective

The research aims to identify agricultural policies and their impact on achieving food security in both Egypt and Morocco .

Research hypothesis

The research stems from the hypothesis that agricultural policies in both Egypt and Morocco will not be able to have positive effects on the reality of the agricultural sector, except after making adjustments in the tools and contents of those policies, and the introduction of new tools that are compatible with the political, economic and social developments established by those countries.

Research methodology

The research relied in its methodology on the link between the theoretical and applied methods to reach a solution to the research problem.

Materials and Research Methods

The study of the practical side included a 26-year time series (1995-2020) for strategic crops (wheat, rice) for both Egypt and Morocco, and the food gap variable was adopted as a dependent variable, while the independent variables were relied on six variables, namely.[3]

X1 Quantity of production for wheat and rice crops

X2 the size of agricultural loans

x3 exchange rate

X4 agricultural investment

X5 economic exposure

x6 average per capita

X7 agricultural support

The analysis was done using the program (Eviews 10) and the multiple linear regression method, and a number of other tests required by the research were used to come up with good results. The stage of describing the standard model followed the preparation of a mathematical formula for the model as follows

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Y=f(x1,x2,x3,x4,x5,x6,x7)

Thus, the aforementioned relationship can be formulated in the form of a standard model that takes the following form:

$YI=B_1X_1+B_2X_2+B_3X_3+B_4X_4+B_5X_5+B_6X_6+B_7X_7$

Since :

Yi : thdependen variable

B0 : the intercept parameter (constant boundary parameter) which represents the parameter that takes a value when the independent variables take zero values in the case of the linear model.

B1---Bn Regression parameters whose values indicate the effect of the dependent variable when the value of the independent variable changes by one unit.

X1---Xn independent variables.

Ui: the random variable that represents non-explanatory variables that were not included in the model.

The analysis is done by using stable time series whose levels change over time without the average changing over a relatively long period of time. The series are stable if the following conditions are met:

The oscillation about the mean is constant over time

E(yt) = u

The stability of the variance of values over time

Var(yt)=E(yt-u)=ϭ2

The covariance between every two values of the same variable depends on the time gap K between the values (yt) and (yt-k) and not on the actual time value at which the covariance is calculated.[2]

Yk=cov(yt,yt+k)=E(yt-u)(yt+k-u)

Also, the extended Dickey-Muller (ADF) was used to detect the unit root in the time series. The unit root test can be clarified through the following equation

Δyt-Bn.əyt-1+ut

where Δ is the first difference in the time series (yt).

Also, the analysis using the (Eviews 10) program requires a measure of integration, which is the association of two or more time series (yt, xt) so that fluctuations in one of them cancel the fluctuations in the other in a way that makes the ratio between their values constant over time, and aware of this that the time series data may It is unstable if taken separately, but it is stable as a group, and such a long-term relationship between the variables is useful in predicting the value of the dependent variable in terms of a set of independent variables.

Results and discussion

First: Egypt

The function of wheat in Egypt1

The unit root test is used for the stability of the time series of wheat crop in Egypt for the period (1995-2020). The variables are stable at the first difference (1) at the level of significance of 5%, and the variable X4 was stable at the level (0)1 and at the level of significance of 5%, which indicates the rejection of the null hypothesis H0:b=0 and the acceptance of the alternative hypothesis H1:b ≠0 means that the function variables chains are stable and do not contain a unit root. For this reason, the model was adopted using the Phillips-Peron test method, as shown in Table(1).

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Table (1) Unit root testing using the Phillips-Perron test method

UNIT ROOT TEST RESULTS TABLE (PP)

Null Hypothesis: the variable has a unit root

	At Level	**Y2**	**X1**	***X2***	**X3**	**X4**	**X5**	**X6**	**X7**
With Constant	**t-Statistic**	**-0.6096**	**-2.6056**	**-2.3700**	**-0.7917**	**-3.7517**	**-1.7104**	**-0.1955**	**-1.7715**
	Prob.	***0.8501***	***0.1063***	***0.1606***	***0.8026***	***O.O1OO***	***0.4130***	***0.9262***	***0.3842***
	nO		**nO**	**nO**	**nO**		**nO**	**nO**	**nO**
With Constant & Trend	**t-Statistic**	**-1.6023**	**-3.5575**	**-2.6770**	**-2.2198**	**-3.6666**	**-3.1707**	**-1.5930**	**-2.1520**
	Prob.		***0.0566***	***0.2538***	***0.4574***	***0.0459***	***0.1147***	***0.7641***	***0.4919***
	nO		*****	**nO**	**nO**		**nO**	**nO**	**nO**
Without Constant & Trend	**t-Statistic**	**0.7470**	**0.3537**	**-0.4943**	**1.4809**	**-0.9092**	**-0.5711**	**2.1025**	**2.0363**
	Prob.		***0.7786***	***0.4908***	***0.9612***	***0.3118***	***0.4588***	***0.9889***	***0.9872***
	nO		**nO**	**nO**	**nO**	**nO**	**nO**	**nO**	**nO**
	At First Difference								
	d(Y2)		**d(X1)**	**d(X2)**	**d(X3)**	**d(X4)**	**d(X5)**	**d(X6)**	**d(X7)**
With Constant	**t-Statistic**	**-6.8011**	**-9.3888**	**-6.1230**	**-3.6005**	**-14.0024**	**-4.3435**	**-1.8840**	**-5.1621**
	Prob.		***0.0000***	***O.OOO1***	***0.0145***	***0.0000***	***0.0028***	***0.3331***	***0.0004***
								nO	
With Constant & Trend	**t-Statistic**	**-8.5775**	**-12.8462**	**-6.7243**	**-3.5089**	**-14.1223**	**-4.3071**	**-1.8105**	**-5.3640**
	Prob.		***0.0000***	***O.OOO1***	***0.0631***	***0.0000***	***0.0132***	***0.6649***	***0.0015***
					*****			**nO**	

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Without Constant & Trend	**t-Statistic**	**-6.5180**	**-8.5917**	**-5.7146**	**-3.2208**	**-14.0908**	**-4.4392**	**-1.4600**	**-4.3967**
	Prob.		***0.0000***	***0.0000***	***0.0026***	***0.0000***	***O.OOO 1***	***0.1312***	***O.OOO1***
								nO	

Notes:

a: (*}Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1 % and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values.

d: **Source: Prepared by the researcher based on program outputs**

After making sure of the stability of the time series of the variables at the level and at the first difference, we perform the initial estimation using the Phillips-Peron method (pp) using the statistical program Eviews10), which automatically determines the optimal deceleration period according to the (AIC) standard. We noticed from Table (2) that the value of The adjusted coefficient of determination (R2) is equal to (0.87), meaning that the independent variables included in the estimated model explain about (87%) of the changes in the dependent variable. Explained, that is, responsible for the variables that are not included in the model and represented by the random variable. As for the calculated value of the (F) test, it is equal to (20.31) and with a significant degree equal to (0.00001), which is less than (0.05), and this means that the estimated model is significant as a whole and can be relied upon in the planning process and future prediction.[3]

Table (2) Results of the preliminary estimation using the Phillips-Perron (PP.) method

As for the co-integration test, it is done by using the limits test, in which the estimated value of F is compared with its tabular value, which is two tabular values that represent the upper bound value in the case that the model variables are integrated from the first degree I(1), and represent the lower bound value in the case of integration from degree zero I(0). If the calculated value of (F) is greater than the minimum critical value, i.e. we reject the hypothesis that there is no long-term equilibrium relationship, and accept the alternative hypothesis with the existence of joint integration between the study variables, but if the calculated value is less than the minimum critical values, the alternative hypothesis is accepted that there is no An equilibrium relationship in the long run, but if the value of (F) lies between the lower and upper limits, the results will be indeterminate, and this means that the inability to make a decision to determine whether there is a co-integration between the variables or not.

Dependent Variable: Y2

Method: ARDL

Date: 10/2/22 Time: 17:0

Sample (adjusted): 1995-2020

Included observations: 21 after adjustments

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Maximum dependent lags: 2 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (1 lag, automatic): X1 X3 X4 X5 X6 X7

Fixed regressors: C

Number of models evaluated: 128

Selected Model: ARDL(1, 0, 0, 0, 0,1,1)

Note: final equation sample is largerthan selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y2(-1)	0.344892	0.118091	2.920567	0.0119
X1	2.066732	0.402296	5.137344	0.0002
X3	-3839755.	1213201.	-3.164977	0.0075
X4	-8413617.	4810767.	-1.748914	0.1039
X5	-3716.142	1226.354	-3.030236	0.0097
X6	-13564.41	4643.393	-2.921228	0.0119
X6(-1)	12524.32	5086.317	2.462356	0.0285
X7	296049.7	697354.6	0.424532	0.6781
X7(-1)	1955940.	909447.8	2.150690	0.0509
C	-14262496	6359153.	-2.242830	0.0430
R-squared	0.901651	Mean dependentvar		-6572583.
Adjusted R-squared	0.871256	S.D. dependentvar		2464907.
S.E. of regression	774560.7	Akaike info criterion		30.25700
Sum squared resid	7.80E+12	Schwarz criterion		30.75069
Log likelihood	-337.9555	Hannan-Quinn criter.		30.38116
F-statistic	20.31098	Durbin-Watson stat		2.255157
Prob(F-statistic)	0.000001			

’Note: p-values and any subsequent tests do not account for model selection.

Source: Prepared by the researcher based on program outputs

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As for the co-integration test, it is done by using the limits test, in which the estimated value of F is compared with its tabular value, which is two tabular values that represent the upper bound value in the case that the model variables are integrated from the first degree I(1), and represent the lower bound value in the case of integration from degree zero I(0). If the calculated value of (F) is greater than the minimum critical value, i.e. we reject the hypothesis that there is no long-term equilibrium relationship, and accept the alternative hypothesis with the existence of joint integration between the study variables, but if the calculated value is less than the minimum critical values, the alternative hypothesis is accepted that there is no An equilibrium relationship in the long run, but if the value of (F) lies between the lower and upper limits, the results will be indeterminate, and this means that the inability to make a decision to determine whether there is a co-integration between the variables or not.

It is evident from Table (3) that the F-statistic (8.72) was higher than the upper limit of the critical values in the model, which were obtained from the tables proposed by (Pesaran at al, 2001) at significant levels (1%, 2.5). %, 5%, 10%), and this means that we reject the null hypothesis (H0:b=0) and accept the alternative hypothesis (H1:b≠0) at the four levels of significance, that is, there is a long-term equilibrium relationship (co-integration) between the variables under study.[5] .

Table (3) results of the co-integration test using the boundary test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	KO)	Id)
			Asymptotic: n=1000	
F-statistic	8.726049	10%	2.12	3.23
K	6	5%	2.45	3.61
		2.5%	2.75	3.99
		1%	3.15	4.43

Source: Prepared by the researcher based on the outputs of Eviews10

As for the ARDL model (error correction model), the significance of the variables was (X1, X4, X5, X6, X7) (the volume of agricultural production, agricultural investment, agricultural exposure, and agricultural support) respectively after conducting statistical and standard tests, and it was possible to interpret (87 %) of the changes brought about by the independent variables in the dependent variable through the value of the adjusted coefficient of determination R^{-2}, and the remaining percentage (7%) was outside the model variables and they are included under the so-called random variable, and the sign of the parameters that reflects the nature of the relationship between the dependent variable and the independent variables in In the short run, it can be explained: Since (X1) the quantity of production for the wheat crop, the sign of its positive parameter was inconsistent with the logic of the economic theory, as the direct relationship between it and the dependent variable reflected the size of the food gap, and

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the elasticity of the parameter indicates that with an increase of (X1) by (1%) The food gap will increase by (0.35%) and this is due to the large population increase in Egypt and that the production, no matter how increased, does not keep pace with the large population increase that was in large increases during the research period.

As for (X2) the size of agricultural loans, it was dropped from the equation due to its lack of morality and its negative impact on the morale of the function as a whole.

The significance of (X3) of the exchange rate did not appear in the equation, and this may be due to the policy of floating the exchange rate adopted by the Egyptian government. Therefore, the significance of this variable did not appear in the overall policies in general and the exchange rate policies in particular.[6]

In front of the change (X4) of agricultural investment, it showed the insignificance of this variable due to the lack of equipment for land reclamation and cultivation and the lack of capital in Egypt.

The results of the variable (X5) showed the economic exposure rate that the sign of its parameter is negative indicating the inverse relationship between it and the size of the nutritional gap of the wheat crop, as the flexibility of its parameter indicates that by increasing the rate of exposure by (1%), the gap will decrease by (-1.2%), by increasing Dealings with the outside world in the field of foreign trade may adversely affect the competitiveness of the agricultural sector and reduce the cost schedules as a result of the increase in local support and giving economic freedom that stimulates agricultural producers to increase their production, including the wheat crop, because there are opportunities to achieve higher income levels and achieve competitive advantages in global markets.

With regard to the variable ((X6) the average per capita income whose positive parameter sign indicates the direct relationship between it and the size of the food gap from the wheat crop, where flexibility indicates that with an increase in the purchasing power of the individual, that is, with an increase in purchasing power by (1%), the food gap will increase by (- 0.48%), which is considered normal, due to the increase in local demand for this necessary crop.

As for the agricultural subsidy (X7), the results showed its significance and positive indication of the positive and positive relationship between it and the dependent variable (the food gap), and this is logical from the point of view of economic theory, that is, by increasing agricultural subsidies by 1%, it will increase investments and agricultural output, which in turn will It works to reduce the food gap by(0.65)%.

Table (4) Estimation of the error correction model and the short- and long-run relationship Phillips-Beron model

Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-14262496	6359153.	0.000000	0.0000
Y2(-1)*	-0.655108	0.118091	-5.547491	0.0001
X1**	2.066732	0.402296	5.137344	0.0002
X3**	-3839755.	1213201.	0.000000	0.0000

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X4**	-8413617.	4810767.	0.000000	0.0000
X5**	-3716.142	1226.354	-3.030236	0.0097
X6(-1)	-1040.088	667.9975	-1.557023	0.1435
X7(-1)	2251990.	894001.0	2.519002	0.0257
D(X6)	-13564.41	4643.393	-2.921228	0.0119
D(X7)	296049.7	697354.6	0.424532	0.6781

ARDL Long Run Form and Bounds Test

Dependent Variable: D(Y2)

Selected Model: ARDL(1, 0, 0, 0, 0,1,1)

Case 3: Unrestricted Constant and No Trend

Date: 10/2/22 Time: 17:2

Sample: 1995-2020

Included observations: 21

* p-value incompatible with t-Bounds distribution.

** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	3.154796	0.789071	3.998114	0.0015
X3	-5861257.	2241468.	-2.614919	0.0214
X4	-12843103	7816035.	-1.643174	0.1243
X5	-5672.565	2166.898	-2.617827	0.0213
X6	-1587.659	908.2384	-1.748064	0.1040
X7	3437587.	1599918.	2.148602	0.0511

EC = Y2 - (3.1548*X1 -5861256.7604*X3 -12843103.4245*X4 -5672.5653 *X5 -1587.6587*X6 + 3437586.7707*X7)

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Source: Prepared by the researcher based on the outputs of Eviews10

-2The function of rice in Egypt

The unit root is tested for the stability of the time series of the rice crop in Egypt for the period (1995-2020) for the variables (y,x1,x2,x3,x4,x5,x6,x7), and the results indicate the instability of the time series of the variables (Y,X2, X4, X6) at the level, and the chains of those variables became stable at the first difference I(1) at the level of significance (1%), while the rest of the variables X1, X3, X5) for the function under study were stable at the level I(0), And at the level of significance (5%), which indicates the possibility of rejecting the null hypothesis (H0:b=0) and accepting the alternative hypothesis (H1:b≠0), meaning that the function variables chains are stable and do not contain a unit root, and for this the regression model was adopted ARDL.[7]

Table (5) Unit root test using Dickey Fuller (ADF) method

UNIT ROOT TEST RESULTS TABLE (ADF) Null Hypothesis: the variable has a unit root At Level

		LNY	LNX1	LNX2	LNX3	LNX4	LNX5	LNX6
With Constant	t-Statistic	-0.4653	-3.6199	-0.9230	-3.6914	-1.3748	-0.6447	-1.8113
	Prob.	*0.8806*	*0.0134*	*0.7621*	*0.0115*	*0.5764*	*0.8400*	*0.3659*
		nO	**	nO	**	nO	nO	nO
With Constants.Trend	t-Statistic	-2.6204	1.7251	-2.9635	-3.6018	-5.2676	-3.8815	-2.2497
	Prob.	*0.2753*	*1.0000*	*0.1646*	*0.0520*	*0.0024*	*0.0309*	*0.4424*
		nO	nO	nO	*	***	**	nO
Without Constant & Trend	t-Statistic	-0.1314	-0.8570	1.9816	0.0342	-0.1425	1.8129	1.7930

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	Prob.	*0.6271*	*0.3315*	*0.9857*	*0.6836*	*0.6237*	*0.9790*	*0.9789*
		nO	nO	nO	nO	nO	nO	nO
	At First Difference							
	d(LNY)		d(LNX1)	d(LNX2)	d(LNX3)	d(LNX4)	d(LNX5)	d(LNX6)
With Constant	t-Statistic	-7.8385	-3.9630	-3.1312	-5.9258	-4.5376	-2.1577	-5.3134
	Prob.	*0.000*	*0.0076*	*0.0388*	*O.OOO1*	*0.0018*	*0.2261*	*0.0003*
		***	***	**	***	***	nO	***
With Constants.Trend	t-Statistic	-8.0316	-6.5320	-3.1009	-5.7617	-4.5103	-2.5266	-3.6610
	Prob.	*0.000*	*0.0002*	*0.1304*	*0.0006*	*0.0087*	*0.3132*	*0.0485*
		***	***	nO	***	***	nO	**
Without Constant S. Trend	t-Statistic	-7.8077	-7.9247	-2.7561	-6.0851	-4.6267	-1.8579	-4.5341
	Prob.	*0.000*	*0.0000*	*0.0082*	*0.0000*	*O.OOO1*	*0.0614*	*O.OOO1*
		***	***	***	***	***	*	***

Notes:

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a: (*)Significant at the 10%; (**)Si g n ifi ca nt at the 5%; (***) Significant at the 1 % and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values.

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(Eviews10). Source: Prepared by the researcher, based on program outputs

After ensuring the stability of the time series of the variables at the level and at the first difference, we perform the initial estimate of the Autoregressive Distributed Deceleration (ARDL) model using the statistical program Eviews10), which automatically determines the optimal deceleration period according to the AIC criterion. We noticed from Table (6) that The value of the Adjusted Determination Coefficient (R^2) is equal to (0.94), meaning that the independent variables included in the estimated model explain about (94%) of the changes in the dependent variable, and this is an indication that the explanatory factors have the greatest impact on the function, but they are not explained, which is responsible for them. The variables that are not included in the model and are represented by the random variable. As for the calculated value of the (F) test, it is equal to (89.17) This means the significance of the function as a whole.[8]

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Table (6) Results of the initial estimation of the ARDL modle

Dependent Variable: LNY

Method: ARDL

Date12/02/21 Time: 01:14

Sample (adjusted): 1995-2020

Included observations: 21 after adjustments

Maximum dependent lags: 1 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (2 lags, automatic): LNX1 LNX2 LNX3 LNX4 LNX5 LNX6

Fixed regressors: C

Number of models evaluated: 729

Selected Model: ARDL(1, 2, 2,2, 2, 2,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob*
LNY(-1)	0.817942	0.140440	5.824142	0.0101
LNX1	-582668.1	110052.4	-5.294462	0.0131
LNX1(-1)	1067596.	208829.8	5.112280	0.0145
LNX1(-2)	-3687624.	355849.3	-10.36288	0.0019
LNX2	1510672.	2409984.	0.626839	0.5752
LNX2(-1)	16400448	2921971.	5.612803	0.0112
LNX2(-2)	-19606300	3571429.	-5.489764	0.0119
LNX3	-9641405.	1420068.	-6.789397	0.0065
LNX3(-1)	-8562069.	1307695.	-6.547449	0.0072
LNX3(-2)	-9335958.	1388838.	-6.722135	0.0067
LNX4	-1324179.	744495.8	-1.778625	0.1734
LNX4(-1)	4093567.	831381.5	4.923813	0.0161
LNX4(-2)	-3774602.	903087.4	-4.179664	0.0250
LNX5	1845709.	2223815.	0.829975	0.4674
LNX5(-1)	39056770	6165917.	6.334300	0.0080

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LNX5(-2)	-47882984	7083521.	-6.759771	0.0066
LNX6	22888817	3917493.	5.842720	0.0100
LNX6(-1)	17150114	3219186.	5.327469	0.0129
C	-44440648	8664883.	-5.128823	0.0144

R-squared	0.908195	Mean dependentvar	-488929.4
Adjusted R-squared	0.947365	S.D. dependentvar	1205990.
S.E. of regression	135558.8	Akaike info criterion	26.20704
Sum squared resid	5.51E+10	Schwarz criterion	27.14931
Log likelihood	-269.2775	Hannan-Quinn criter.	26.42901
F-statistic	89.17096	Durbin-Watson stat	2.336472

Source: Prepared by the researcher based on program outputs(Evwies 10)

As for the co-integration test, it is done by using the limits test, in which the estimated (F) statistic is compared with the tabular values suggested by (Pesaranet al., 2001) and not the normal F value, which is two tabular values, representing the upper bound value in the case that the model variables are integrated of degree The first is I(1) and represents the minimum value in the case of the zero degree integral, I(0). If the calculated value of (F) is greater than the minimum critical value, that is, we reject the hypothesis that there is no long-term equilibrium relationship, and we accept the alternative hypothesis that there is a joint integration between the variables of the study, but if the calculated value is less than the minimum critical values, the alternative hypothesis is accepted that there is no An equilibrium relationship in the long run, but if the value of (F) lies between the lower and upper limits, the results will be indeterminate, and this means that the inability to make a decision to determine whether there is a co-integration between the variables or not.

It is evident from Table (7) that the statistic F (10.36) was higher than the upper limit of the critical values in the model, which were obtained from the tables suggested by (Pesaran at al, 2001) at significant levels (1%, 2.5%, 5%, 10%), This means that we reject the null hypothesis (H0:b=0) and accept the alternative hypothesis (H1:b≠0) at the four levels of significance, that is, the existence of a long-term equilibrium relationship (co-integration) between the variables under study.[6]

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Table (7) Co-integration test results using boundary test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	KO)	Id)
			Asymptotic: n=1000	
F-statistic	10.36052	10%	2.12	3.23
K	6	5%	2.45	3.61
		2.5%	2.75	3.99
		1%	3.15	4.43

Source: Prepared by the researcher based on the outputs of the program(Eviews10)

As for the ARDL model, the significance of only four variables (X1, X3, X5, X6) (rice production volume, exchange rate, agricultural exposure degree, average per capita income) were shown, respectively, after conducting statistical and standard tests. Reflecting the nature of the relationship between the dependent variable and the independent variables, it can be explained in the short run:

With regard to (X1) the volume of production for rice, it was found through its previous parameter to the inverse relationship between it and the size of the food gap, and this is logical in terms of economic theory.

With regard to (X3) the exchange rate of the currency, which had an inverse relationship with the adopted variable, as it indicates its flexibility, as an increase in the exchange rate of foreign currencies against the local currency will lead to stimulating foreign trade, which stimulates the producer to increase production, and this increase will be proportional to the volume of domestic consumption and this leads to Reducing the size of the food gap.

As for (X5) the degree of agricultural exposure, where the negative sign showed the inverse relationship between it and this dependent variable, and the significance of (X2) the size of agricultural loans and (X4) agricultural investment did not appear.

Regarding (X6) the average income of the individual, the sign of its positive parameter, the positive relationship between this variable and the size of the nutritional gap of the wheat crop, where the flexibility indicates that the increase in the purchasing power of the individual is a normal thing because of the increase in the local demand for this necessary crop.

The agricultural support variable (X7) has been removed from the equation because of the negative impact it had on the equation as a whole.

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Table (8) estimating the error correction model and the short and long-term relationship according to the model ARDL

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-44440648	8664883.	0.000000	0.0000
LNY(-1)*	-0.182058	0.140440	-1.296340	0.2856
LNX1(-1)	-3202696.	571870.1	-5.600391	0.0112
LNX2(-1)	-1695180.	1298298.	0.000000	0.0000
LNX3(-1)	-27539432	3953300.	0.000000	0.0000
LNX4(-1)	-1005213.	482434.6	-2.083626	0.1286
LNX5(-1)	-6980504.	1117982.	0.000000	0.0000
LNX6(-1)	40038931	6506604.	0.000000	0.0000
D(LNX1)	-582668.1	110052.4	-5.294462	0.0131
D(LNX1(-1))	3687624.	355849.3	10.36288	0.0019
D(LNX2)	1510672.	2409984.	0.000000	0.0000
D(LNX2(-1))	19606300	3571429.	0.000000	0.0000
D(LNX3)	-9641405.	1420068.	0.000000	0.0000
D(LNX3(-1))	9335958.	1388838.	0.000000	0.0000
D(LNX4)	-1324179.	744495.8	-1.778625	0.1734
D(LNX4(-1))	3774602.	903087.4	4.179664	0.0250
D(LNX5)	1845709.	2223815.	0.000000	0.0000
D(LNX5(-1))	47882984	7083521.	0.000000	0.0000
D(LNX6)	22888817	3917493.	0.000000	0.0000

* p-value incompatible with t-Bounds distribution.

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Levels Equation

Case 3: Unrestricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNX1	-17591629	13020013	-1.351122	0.2695
LNX2	-9311210.	11925693	-0.780769	0.4919
LNX3	-1.51E+08	1.07E+08	-1.411008	0.2531
LNX4	-5521392.	5212380.	-1.059284	0.3672
LNX5	-38342205	26323498	-1.456577	0.2413
LNX6	2.20E+08	1.63E+08	1.348212	0.2703

Source: Prepared by the researcher based on the outputs of(Eviews10)

Second: Morocco

1-The function of wheat in Morocco

The unit root test is used for the stability of the time series of the wheat crop in Morocco for the period (1995-2020), and the results indicate the instability of the time series of the variables (Y, X2, X3, X4, X1) at the level, and the series of these variables became stable at the first difference I (1) At the level of significance (5%), while the variables, X6)X5 of the function under study were stable at the level I(0), and at the level of significance (1%, 5%), which indicates the possibility of rejecting the null hypothesis (H0:b=0) and accepting the alternative hypothesis (H1:b≠0), that is, the chains of function variables are stable and do not contain a unit root, and for this reason, the Phillips-Perron (PP) model was adopted.[5]

Table(9) Unit root test using Phillips-Perron (PP .) method

UNIT ROOT TEST RESULTS TABLE (PP) Null Hypothesis: the variable has a unit root At Level

	Y	**X1**	**X2**	***X3***	**X4**	***X5***	***X6***	**X7**
With Constant	**t-Statistic -1.9020**	**-2.8586**	**-2.5882**	**-0.1779**	**-1.4179**	**-2.9852**	***0.0670***	**-1.8030**
	Prob.0.3256	***0.0659***	***0.1097***	***0.9285***	***0.5557***	***0.0513***	***0.9557***	***0.3697***
	nO	*****	**nO**	**nO**	**nO**	*****	**nO**	**nO**
With Constants.Trend	**t-Statistic -3.4300**	**-3.1046**	**-2.6355**	**-1.5307**	**-2.3253**	**-3.5294**	**-2.2831**	**-2.3498**
	Prob.0.0719	***0.1286***	***0.2694***	***0.7885***	***O.4O51***	***0.0597***	***0.4258***	***0.3934***

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	*	nO	nO	nO	nO	*	nO	nO
Without Constant & Trend	**t-Statistic -1.1274**	**-0.5240**	**-1.7607**	**1.0222**	**0.4283**	**-2.8071**	**1.7269**	**-0.8989**
	Prob.0.2281	***0.4786***	***O.O745***	***0.9139***	***0.7981***	***0.0072***	***0.9759***	***0.3161***
	nO	**nO**	*	**nO**	**nO**	***	**nO**	**nO**
	At First Difference							
	d(Y)	**d(X1)**	**d(X2)**	**d(X3)**	**d(X4)**	***d(X5)***	**d(X6)**	**d(X7)**
With Constant	**t-Statistic -9.1161**	**-11.5949**	**-6.5047**	**-5.3298**	**-5.5044**	**-8.2284**	**-4.8605**	**-6.2038**
	Prob.0.0000	***0.0000***	***0.0000***	***0.0003***	***O.OOO2***	***0.0000***	***0.0009***	***0.0000***
	***	***	***	***	***	***	***	***Icicle***
With Constants.Trend	**t-Statistic -11.3234**	**-11.7870**	**-6.3660**	**-5.6230**	**-5.3974**	**-8.4022**	**-5.0913**	**-6.1836**
	Prob.0.0000	***0.0000***	***0.0002***	***0.0008***	***0.0014***	***0.0000***	***0.0026***	***0.0003***
	***	***	***	***	***	***	***	***Icicle***
Without Constant S. Trend	**t-Statistic -7.3307**	**-11.0389**	***-6.6557***	**-5.0993**	***-5.6265***	**-7.4238**	**-4.5639**	**-6.3444**
	Prob.0.0000	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***0.0000***	***O.OOO1***	***0.0000***
	***	***	***	***	***	***	***	***Icicle***

Notes:

a: (*)Significant at the 10%; (**)Si g n ifi ca nt at the 5%; (***) Significant at the 1 % and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values.

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Source: Prepared by the researcher, based on program outputs(Eviews10)

After ensuring the stability of the time series of the variables at the level and at the first difference, we perform the initial estimation of the model using the Phillips-Peron method (pp). Using the Eviews10 statistical program, which automatically determines the optimal delay time according to the (AIC) criterion, we noticed from Table (10) that the value of the corrected determination coefficient (R2 -)) is equal to (0.90), meaning that the independent variables included in the estimated model explain about (90 % of changes in the dependent variable, This is an indication that the explanatory factors have the greatest impact on the function. As for the unexplained percentage, that is, the variables not included in the model are responsible for it and are represented by the random variable. The calculated (F) test value is equal to (18.45) and with a significant score equal to (0.0061), which is less than (0.05).), and this means that the estimated model is moral as a whole and can be relied upon in the future planning and forecasting process.

Table (10) results of the initial estimation of the ARDEL model

Dependent Variable: Y

Method: ARDL

Date: 20/2/21 Time: 17:31

Sample (adjusted): 1995-2020

Included observations: 21 after adjustments

Maximum dependent lags5 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (1 lag, automatic): X1 X2 X3 X4 X7 X6

Fixed regressors: C

Number of models evaluated: 128

Selected Model: ARDL(5, 0, 1, 1, 0,0,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y (-1)	-1.380812	0.293405	-4.653297	0.0119
Y(-2)	-2.412322	0.417526	-5.325879	0.0002
Y(-3)	-2.554625.	0.538126	-4.365879	0.0075
Y(-4)	-0.213657	0.290154	-1.748914	0.1039
Y(-5)	-1.326589	0.365489	-3.030236	0.0097
X1	-13564.41	0.326598	-3.921228	0.0119
X2	-1825461	541.2360	-3.462356	0.0285

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X2(-1)	-2389541	747.3652	-3.424532	0.6781
X3	3398651	8867.320	3.150690	0.0509
X3(-1)	5540986	11131.20	4.242830	0.0430
X4	-3562410	2920564	-1.365890	0.2365
X7	6.021543	2596351	0.325781	0.2658
X6	2824975	7026359	4.695874	0.6635
X6(-1)	1197012	3894580	3.004152	0.2121
C	2275374	2322126	0.979659	0.3583
R-squared	0.951651	Mean dependentvar		1321745
Adjusted R-squared	0.901256	S.D. dependentvar		1604577
S.E. of regression	420324.5	Akaike info criterion		28.3265
Sum squared resid	7.80E+11	Schwarz criterion		29.3654
Log likelihood	-258.1843	Hannan-Quinn criter.		28.3214
F-statistic	18.45112	Durbin-Watson stat		2.444737
Prob(F-statistic)	0.006125			

'Note: p-values and any subsequent tests do not account for model selection.

Source: Prepared by the researcher based on program outputs

As for the integration test, it is done by using the limits test, in which the estimated (F) statistic is compared with the tabular values suggested by (Pesaranet al., 2001) and not the normal F value, which is two tabular values, representing the upper bound value in the case that the model variables are integrated of the first degree I(1) represents the minimum value in the case of zero degree integration I(0). If the calculated value of (F) is greater than the minimum critical value, that is, we reject the hypothesis that there is no long-term equilibrium relationship, and we accept the alternative hypothesis that there is a joint integration between the study variables, but if the calculated value is less than the minimum critical values, we accept the alternative hypothesis that there is no An equilibrium relationship in the long run, but if the value of (F) lies between the lower and upper limits, the results will be indeterminate, and this means that the inability to make a decision to determine whether there is a co-integration between the variables or not.

It is clear from Table (11) that the F-statistic (12.60) was higher than the upper limit of the critical values in the model, which were obtained from the tables proposed by (Pesaran at al, 2001) at significant levels (1%,

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2.5%, 5%, 10%), and this It means that we reject the null hypothesis (H0:b=0) and accept the alternative hypothesis (H1:b≠0) at the four levels of significance, that is, the existence of a long-term equilibrium relationship (co-integration) between the variables under study.

Table (11) The results of the co-integration test using the boundary test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	KO)	Id)
			Asymptotic: n=1000	
F-statistic	12.60986	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

Source: Prepared by the researcher based on the outputs of(Eviews10)

As for the ARDL model (error correction model), it showed through the ARDL model the significance of four variables (X1, X2, X3, X6)) which are (the volume of domestic production, agricultural loans, exchange rate and agricultural support) after conducting a T-test under the level of significance (0.05) and it was possible to explain (90%) of the changes caused by the independent variables in the dependent variable through the value of the coefficient of determination R^2, and the remaining percentage (10%) was from outside the model variables and they are included under the so-called random variable, while there was no significant (X7) , X4) (investment and average per capita income) respectively, while (X5) the degree of agricultural exposure has been excluded from the equation, and the sign of the parameters that reflects the nature of the relationship between the dependent variable and the independent variables in the short term can be explained: Since (X1) is a quantity The production of wheat crop, its negative parameter sign was consistent with the logic of the economic theory, as the inverse relationship between it and the dependent variable reflected the size of the food gap, and the elasticity of the parameter indicates that by increasing (X1) by (1%), the food gap will decrease by (-0.39%), and this increase will encourage Investments from this crop in the Syrian agricultural sector And then the food gap will decrease from the crop, we find that (X2) the size of agricultural loans, the sign of its negative parameter shows the inverse relationship between it and the size of the food gap from the wheat crop, which is a semi-logical relationship that agrees with the economic theory, where the elasticity of the parameter indicates that the decrease in the size of loans will reduce of agricultural production, and then the food gap from the crop will increase by the amount of the decrease and in a similar manner in proportions.

As for the exchange rate (X3), its positive sign showed a direct relationship between it and the dependent variable (the nutritional gap of the wheat crop), meaning

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that with an increase in the exchange rate by (1%), the gap will increase by (0.75%).

As for (X4) agricultural investment, it showed the insignificance of this variable, i.e. investment in the agricultural sector of wheat crop with a poor economic return compared to the rest of the high-yielding vegetable crops that are grown throughout the year.

As for (X5) the degree of agricultural economic exposure, the variable was dropped from the equation due to its lack of morality and its negative impact on the morale of the function as a whole.

With regard to (X6), the average per capita income was also not significant, and the reason for this is that the average per capita income of the Syrian is insufficient and considered low, and the average per capita income in Morocco is not large.

As for (X7) agricultural support, it showed the significance of this variable, and it is a logical relationship, as the flexibility indicates that by increasing the support by (1%), the gap of the wheat crop will decrease by (0.51%), meaning that by increasing the support, the output of wheat will increase in proportion to the increase The increasing domestic consumption in Morocco will reduce the food gap of this crop.

Table (12) Estimation of the error correction model and the short and long-term relationship according to the Phillips-Perron (PP) model

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2275374.	2322533.	0.000000	0.0000
Y(-1)	-9.118141	1.454939	-6.267027	0.0033
X1**	-1.100807	0.327196	-3.364362	0.0282
X2(-1)	-4208.263	938.0225	-4.486313	0.0109
X3(-1)	89049.18	14150.06	6.293201	0.0033
X4**	-3537472.	2920297.	0.000000	0.0000
X7**	6.088930	25.97507	0.234414	0.8262
X6(-1)	40213361	6164181.	0.000000	0.0000
D(Y(-1))	6.757325	1.207939	5.594095	0.0050
D(Y(-2))	4.345158	0.889633	4.884216	0.0081
D(Y(-3))	1.791567	0.401021	4.467519	0.0111
D(Y(-4))	1.262127	0.366930	3.439698	0.0263
D(X2)	-1818.581	541.1204	-3.360771	0.0283

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D(X3)	33641.29	8867.718	3.793680	0.0192
D(X6)	28242975	7026192.	0.000000	0.0000

* p-value incompatible with t-Bounds distrib

** Variable interpreted as Z = Z(-1) + D(Z).

Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	-0.120727	0.028023	-4.308079	0.0126
X2	-461.5264	56.52337	-8.165232	0.0012
X3	9766.155	464.1229	21.04217	0.0000
X4	-387959.8	307528.8	-1.261540	0.2757
X7	0.667782	2.863836	0.233177	0.8271
X6	4410259.	320198.3	13.77352	0.0002
C	249543.6	244061.2	1.022463	0.3644

EC = Y-(-0.1207*X1 -461.5264*X2 + 9766.1551*X3 -387959.8010*X4+ 0.6678*X7 + 4410258.9337*X6 + 249543.6335)

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Source: Prepared by the researcher based on program outputs

-2The function of rice in Morocco

The unit root is tested for the stability of the time series of the rice crop in Morocco for the period (1995-2020) for the variables (Y,X1,X2,X3,X4,X5,X6,X7), and the results indicate the instability of the time series of the variables (Y,X2,X3 , X6, X4, X5) at the level, and the chains of those variables became stable at the first difference I(1) at the level of significance (5%), while the variable X1) for the function under study was stable at the level I(0), and at the level of Significant (5%), as this indicates the possibility of rejecting the null hypothesis (H0:b=0) and accepting the alternative hypothesis (H1:b≠0), meaning that the series of function variables are stable and do not contain a unit root. Delayed or Distributed Time Lapses (ARDL).

Table (13) unit root test using Dickey Fuller (ADF) method

UNIT ROOT TEST RESULTS TABLE (ADF) Null Hypothesis: the variable has a unit root At Level

	LNY	LNX1	LNX2	LNX3	LNX4	LNX5	LNX6
With Constant	t-Statistic -2.3475	-2.2444	-3.4469	-1.6021	-1.3215	-2.2800	-3.0581
	Prob.0.1667	0.1972	0.0196	0.4655	0.6016	0.1862	0.0443
	No	nO	**	nO	nO	nO	**
With Constants.Trend	t-Statistic -2.4065	-5.4609	-3.3745	-3.0201	-1.1628	-2.2949	-3.8140
	Prob.0.3668	0.0017	0.0797	0.1525	0.8946	0.4200	0.0344
	nO	***	*	nO	nO	nO	**
Without Constant & Trend	t-Statistic -1.9514	-0.1219	0.3637	-0.5254	-1.3533	1.3157	0.6033
	Prob.0.0505	0.6309	0.7813	0.4780	0.1582	0.9476	0.8394
	*	nO	nO	nO	nO	nO	nO
	At First Difference						
	d(LNY)	d(LNX 1)	d(LNX2)	d(LNX 3)	d(LNX 4)	d(LNX 5)	d(LNX 6)
With Constant	t-Statistic -6.2250	-5.2687	-5.7410	-6.3008	-4.2448	-4.6897	-6.4735
	Prob.0.0000	0.0003	O.OOO1	0.0000	0.0035	0.0013	0.0000
	***	***	***	***	***	***	***

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With Constants.Trend	t-Statistic -5.2946	-5.1766	-5.6831	-6.3358	-4.4504	-4.7456	-6.2873
	Prob.0.0019	O.OO22	0.0007	0.0002	0.0098	0.0053	O.OOO2
	***	***	***	***	***	***	***
Without Constant S. Trend	t-Statistic -6.3830	-5.3828	-5.8175	-6.4993	-4.3487	-4.4488	-6.5087
	Prob.0.0000	0.0000	0.0000	0.0000	O.OOO1	O.OOO1	0.0000
	***	***	***	***	***	***	***

Notes:

a: (*)Significant at the 10%; (**)Si g n ifi ca nt at the 5%; (***) Significant at the 1 % and (no) Not Significant

b: Lag Length based on SIC

c: Probability based on MacKinnon (1996) one-sided p-values.

Source: Prepared by the researcher based on the outputs of(Eviews10)

After ensuring the stability of the time series of the variables at the level and at the first difference, we first estimate the Autoregressive Distributed Deceleration (ARDL) model using the statistical program Eviews10), which automatically determines the optimal deceleration period according to the (AIC) criterion. We noticed from Table (14) that the value of the coefficient of determination Adjusted R2) equals (0.89), meaning that the independent variables included in the estimated model explain about (89%) of the changes in the dependent variable. The variables that are not included in the model are represented by the random variable, while the calculated value of the (F) test is equal to (23.98) and with a significant degree equal to (0.0033), which is less than (0.05), and this means that the estimated model is significant as a whole and can be relied upon in the process of planning and future prediction.[1]

Table (14) Results of the initial estimation of the ARDL model

Dependent Variable: LNY

Method: ARDL

Date: 06/03/21 Time: 15:49

Sample (adjusted): 1995-2020

Included observations: 21 after adjustments

Maximum dependent lags: 4 (Automatic selection)

Model selection method: Akaike info criterion (AIC)

Dynamic regressors (1 lag, automatic): LNX1 LNX2 LNX3 LNX4 LNX5 LNX6

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Fixed regressors: C

Number of models evaluated: 256

Selected Model: ARDL(4,1,1, 0,1,1,1)

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNY(-1)	0.488038	0.218424	2.234357	0.0892
LNY(-2)	1.980149	0.423286	4.678046	0.0095
LNY(-3)	1.285055	0.185433	6.930029	0.0023
LNY(-4)	1.206668	0.203310	5.935110	0.0040
LNX1	-83214.17	28644.05	-2.905112	0.0439
LNX1(-1)	409224.1	59137.86	6.919833	0.0023
LNX2	74050.51	149082.2	0.496709	0.6455
LNX2(-1)	-1071504.	263071.9	-4.073047	0.0152
LNX3	-1703872.	390916.5	-4.358661	0.0121
LNX4	-146039.4	38357.64	-3.807311	0.0190
LNX4(-1)	-49073.20	14661.82	-3.347005	0.0286
LNX5	-1027615.	484680.2	-2.120191	0.1013
LNX5(-1)	-1246547.	178445.6	-6.985584	0.0022
LNX6	-115496.7	75462.55	-1.530516	0.2006
LNX6(-1)	-104897.8	75420.04	-1.390847	0.2366
C	53545217	10591468	5.055505	0.0072
R-squared	0.939439	Mean dependentvar		-325563.3
Adjusted R-squared	0.899838	S.D. dependentvar		390504.4
S.E. of regression	87461.11	Akaike info criterion		25.58634
Sum squared resid	3.06E+10	Schwarz criterion		26.38292
Log likelihood	-239.8634	Hannan-Quinn criter.		25.74184
F-statistic	23.98466	Durbin-Watson stat		2.094094

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Prob(F-statistic)	0.003396			
*Note: p-values and any subsequent tests do not account for model				

Source: Prepared by the researcher based on the outputs of(Eviews10)

As for the co-integration test (border test), the F statistic was calculated in the light of the bounds testing, where the null hypothesis (H0:b = 0) which says that there is no co-integration between the model variables (there is no long-term equilibrium relationship) is tested against the hypothesis The alternative (H1:b≠0) which states that there is a long-term co-integration relationship between the levels of the model variables. Here, the estimated (F) statistic is compared with the tabular values proposed by (Pesaranet al., 2001) and not the normal (F) value, which is about Two tabular values, representing the upper bound value in the case of the model variables being integral of the first degree I(1), and representing the lower bound value in the case of the zero-degree integration I(0). The hypothesis of the absence of a long-term equilibrium relationship, and the alternative hypothesis is accepted that there is a co-integration between the variables of the study, but if the calculated value is less than the minimum critical values, the alternative hypothesis is accepted that there is no equilibrium relationship in the long run, but if the value (F) lies between The lower and upper bounds, the results will be indefinite This means that the inability to make a decision to determine whether there is a co-integration between the variables or not.

It is evident from Table (15) that the F-statistic amounting to (20.96) was higher than the upper limit of the critical values in the model, which were obtained from the tables proposed by (Pesaran at al, 2001) at significant levels (1%, 2.5%, 5%, 10%), and this It means that we reject the null hypothesis (H0:b=0) and accept the alternative hypothesis (H1:b≠0) at the three levels of significance, that is, there is a long-term equilibrium relationship (co-integration) between the variables under study.

Table (15) results of the co-integration test using the boundary test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	KO)	Id)
			Asymptotic: n=1000	
F-statistic	20.96136	10%	1.99	2.94
K	6	5%	2.27	3.28
		2.5%	2.55	3.61
		1%	2.88	3.99

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Source: Prepared by the researcher based on the outputs of the Eviews10

As for the ARDL model (error correction model), the significance of six variables was shown (the volume of agricultural production, the volume of agricultural loans, the exchange rate, agricultural exposure, average per capita income and agricultural support) respectively after conducting statistical and standard tests. It was possible to explain (94%) of the changes that It was brought about by the independent variables in the dependent variable through the value of the adjusted coefficient of determination, R^2, and the remaining percentage was from outside the model variables, and it involves under the so-called random variable, while the variable (agricultural investment) was dropped due to its insignificance and its negative impact on the morale of the function, while the parameter indication that reflects the nature of the relationship Between the dependent variable and the independent variables, it can be explained: Since (X1) the quantity of production for the rice crop, its negative parameter sign was consistent with the logic of the economic theory, as it reflected the inverse relationship between it and the dependent variable (the size of the food gap) and this is logical and consistent with the economic theory, as it led to an increase The produced quantities lead to a decrease in the food gap of Al-Razfi in Morocco, and we find that (X2) the size of agricultural loans shows the positive parameter sign of the positive relationship between it and the variable The gap depends, which is an illogical relationship and does not agree with the economic theory, where the flexibility of the parameter indicates that by increasing the size of the loans, the food gap will increase the yield. and increase the food gap.

As for (X3) the exchange rate, the sign of its positive parameter showed the direct relationship between it and the dependent variable, that is, by increasing the exchange rate, the food gap for the rice crop will increase, so the higher the exchange rate against foreign currencies, which increases the decrease in purchasing power and what increases the burdens of the state's general budget and the increase in the deficit in the general budget Thus, the imported quantities decrease, which increases the food gap.

As for (X4) the degree of agricultural economic exposure, its positive parameter sign showed the direct relationship between it and the dependent variable, that is, by increasing the degree of economic exposure and economic liberalization, the food gap will increase, and this is logical, because economic freedom gives dumping policies the widest scope in reducing production due to successive losses. The farmers and thus the reluctance to grow or switch to the cultivation of other crops, which leads to a decrease in production and an increase in the food gap for grain crops.

With regard to (X5) the average per capita income, the positive sign of its parameter showed the positive relationship between this variable and the size of the food gap of the rice crop, as the flexibility indicates that with the increase in the purchasing power of the individual and the state, especially after 2003 and the increase in national income at high rates, this led to a change in consumer tastes towards The new types of rice that invaded the Moroccan markets.

As for (X6) agricultural support, it showed the significance of this variable, and this is logical from the economic theory. The variable, the size of agricultural investment, was also dropped from the equation due to its lack of morale and its negative impact on the morale of the function. The reason for its lack of morale in Morocco is due to several things, including that agricultural investment was not good, due to the great commercial openness and large dumping policies, which often led to the loss of farmers, causing In their reluctance to cultivate this important strategic crop, as

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well as the transformation of not a few to other government jobs.

Table (16) Estimation of the error correction model and the short and long-term relationship according to the ARD . model

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	53545217	10591468	0.000000	0.0000
LNY(-1)*	3.959911	0.848824	4.665173	0.0096
LNX1(-1)	326009.9	54268.88	6.007309	0.0039
LNX2(-1)	-997453.7	299589.8	-3.329398	0.0291
LNX3**	-1703872.	390916.5	-4.358661	0.0121
LNX4(-1)	-195112.6	41237.87	-4.731395	0.0091
LNX5(-1)	-2274161.	442141.3	-5.143517	0.0068
LNX6(-1)	-220394.4	97347.06	-2.264007	0.0863
D(LNY(-1))	-4.471873	0.731132	-6.116367	0.0036
D(LNY(-2))	-2.491723	0.329200	-7.569018	0.0016
D(LNY(-3))	-1.206668	0.203310	-5.935110	0.0040
D(LNX1)	-83214.17	28644.05	-2.905112	0.0439
D(LNX2)	74050.51	149082.2	0.496709	0.6455
D(LNX4)	-146039.4	38357.64	-3.807311	0.0190
D(LNX5)	-1027615.	484680.2	-2.120191	0.1013
D(LNX6)	-115496.7	75462.55	-1.530516	0.2006

1 p-value incompatible with t-Bounds distribution.

2 * Variable interpreted as Z = Z(-1) + D(Z).

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Levels Equation

Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNX1	-82327.59	11521.25	-7.145717	0.0020
LNX2	251887.9	35989.26	6.998974	0.0022
LNX3	430280.4	98359.32	4.374577	0.0119
LNX4	49271.98	3361.016	14.65985	0.0001
LNX5	574296.1	44504.56	12.90421	0.0002
LNX6	55656.41	26286.54	2.117297	0.1017
C	-13521823	1280524.	-10.55960	0.0005

EC = LNY - (-82327.5893*LNX1 + 251887.8939*LNX2 + 430280.4282*LNX3 +
49271.9770*LNX4 + 574296.0766TNX5 + 55656.4112*LNX6
-13521823.1476)

Eviews10)) Source: Prepared by the researcher, based on program outputs

Conclusions and Recommendations

Conclusions:

1-It was found through the study that there is a production-consumer food gap for cereal crops in (Egypt and Morocco).

2-The study showed the weakness of the agricultural policies followed in Egypt and Morocco, due to the absence of a clear economic vision for the agricultural policies adopted.

3-The agricultural support was not sufficient in both Egypt and Morocco, which showed the great ineffectiveness.

4-The unbalanced distribution among the Arab countries of the resources and energies necessary for development from natural, human and financial resources, which is one of the reasons for the food deficit in the Arab countries in general and the countries under discussion in particular.

Recommendations:

1-Working on finding ways to reduce the food gap for cereal crops (wheat, rice) by relying on scientific methods and methods in preparing production plans and modernizing agriculture in order to achieve the goals set for it in order to reach self-sufficiency for these crops and then achieve food security.

2-Working on the application of policies and procedures for customs protection, especially for grain crops in the research sample countries, in order to obtain

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remunerative prices for local products and reduce dumping policies in the markets to be an incentive to increase agricultural production and reduce agricultural exposure.

3-Reconsidering the agricultural sector, supporting it, orienting in the right way, and following the formulas used by the developed countries to advance the achievement of economic development.

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