IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS)
e-ISSN: 2319-2380, p-ISSN: 2319-2372. Volume 11, Issue 10 Ver. I (October 2018), PP 18-22
www.iosrjournals.org

Response to the presentation of cultivated areas of the tomato crop in Iraq for the period (2015-198)

Hajer Bader Ahmed[*] Majid Abed Hamza[*]
Dept. of Agricultural Economics - College of Agriculture -University of Anbar
Corresponding Author: Hajer Bader Ahmed

Abstract: *The tomato crop is one of the main vegetable crops in Iraq and the most consumed, as it enters most of the cooked, fresh and canned foods. It is one of the most important vegetable crops economically and its nutritional and economic importance. It is grown in two winter seasons by covered agriculture , The study aimed at estimating the response of the presentation of cultivated areas with tomato yield using the joint integration tests and the error correction model (VECM) , The results indicated that the most important factors influencing the response to the presentation of the cultivated areas of the tomato crop are the area planted with the crop for the previous year, the previous year's crop price, the average summer vegetable price for the previous year, irrigation water, the Productive risk and the price risk) using the logarithmic formula , The results indicated a significant error correction at (5%) and a negative sign that is consistent with the economic theory and indicates a long-term equilibrium relationship in the model. The error correction coefficient (0.233185) indicates that the cultivated area of the crop takes about (4.3) Years in the direction of their equilibrium value after the impact of the shock in the model due to the change in explanatory variables , The study showed that the growth rates for area, production and productivity were positive(0.7 ,2.1 ,1.4) respectively.*

Date of Submission: 28-09-2018 Date of acceptance: 15-10-2018

I. Introduction

Tomato is one of the most important crops of summer vegetables and is ranked first among vegetables as a crop used in the manufacturing process. Tamata is also one of the important vegetables on the table. It is eaten as a salad in fresh condition. It is also included in the preservative industry and is used in the manufacture of sauces, Tamata in Iraq for the first time in (1916) and four varieties and give agricultural income ranging between (30-25) million dinars annually(5) , The area cultivated with tomatoes in the world about (1.2) million hectares and the average production of about (33.6) million tons per year and there are more than (700) varieties of tomatoes in the world are characterized by each leg, leaves, shape and size of fruits and color(2) , Although the tomato crop is an important food crop and is a major food for the population, the agricultural sector in the developing countries, including Iraq, suffers from the low cultivated areas and the fluctuation in the production of most agricultural crops, including tomatoes, which result in only a small part of the growing demand resulting from Population growth , The research aims at a set of objectives, which can be summarized by studying the status of tomato production and studying the growth rates during the study period and estimating the response of the width of cultivated areas with the tomato yield for the period 1980-2015 at the country level due to price changes and other important factors As well as estimating the elasticity of the supply of short and long-term self and short-term prices , Although the tomato crop is an important crop, the studies related to the response to the presentation of the cultivated areas with the tomato crop are few , Al-Qahtani and Subhi (1999) indicated that the response of the tomato producers in Saudi Arabia's protected houses is related to the production costs and prices and their ratio to yield, which affects the elasticity of the response and shows a decrease in the elasticity of the view of the protected tomato from (0.688) (1496) riyals to (0.407) at a farm price of (4000) riyals , In addition, the researchers evaluated the response to the changes in prices during the period (2013 - 1994) in Syria, and the use of the modified Nirvov model, The results showed that the changes in the area of each of the studied crops are due to the changes in the prices of the studied crops and the prices of the competing crops and the area planted with the crops studied for the previous year.

II. Materials and Methods

Data on the subject were obtained from the Ministry of Agriculture, the Ministry of Planning, FAO and the Agricultural Statistics Yearbook. Eviews.10 was used to analyze the data for the Tomato Crop Response Survey and used the Joint Integration Method and the VECM.

III. Results And Discussion

The function of the response of the width of cultivated areas of the tomato yield to the variables used in the model was described in logarithmic form during the study period (2015-1980) as follows:

$$lny = b_0 + b_1\, lnx_1 + b_2\, lnx_2 + b_3 lnx_3 + b_4\, lnx_4 + b_5\, lnx_5 + b_6\, lnx_6 + u_i$$

The test of stability of the variables by testing the function of self-correlation and partial and graph of the variables as well as the test of the Doki Fuller and Phelps Peron test and confirmed all these tests that the variables are unstable and contain a root unit at the original level and became stable after taking the first difference and the following table shows the results Phelps Peron test for variables at level and first difference.

Shows (1) test of stability of the variables of tomato crops the results Phelps Peron test

UNIT ROOT TEST TABLE (PP)

		At Level						
		LNY	LNX1	LNX2	LNX3	LNX4	LNX5	LNX6
With Con...	t-Statistic	-1.2979	-2.2396	-1.0125	-0.8024	-4.3298	-5.4834	-2.1138
	Prob.	0.6196	0.1956	0.7380	0.8060	0.0016	0.0001	0.2407
		n0	n0	n0	n0	***	***	n0
With Con...	t-Statistic	0.1875	-1.0992	-1.1943	-1.3842	-4.5014	-5.3915	-2.5621
	Prob.	0.9671	0.9165	0.8862	0.8482	0.0053	0.0005	0.2987
		n0	n0	n0	n0	***	***	n0
Without C...	t-Statistic	-0.3629	0.1778	0.3507	1.0301	-0.5227	-0.6347	-2.2572
	Prob.	0.5467	0.7318	0.7888	0.9171	0.4830	0.4351	0.0245
		n0	n0	n0	n0	n0	n0	**

		At First Difference						
		d(LNY)	d(LNX1)	d(LNX2)	d(LNX3)	d(LNX4)	d(LNX5)	d(LNX6)
With Con...	t-Statistic	-5.6933	-6.6078	-4.8895	-3.2896	-18.7805	-14.9679	-8.0468
	Prob.	0.0000	0.0000	0.0004	0.0233	0.0001	0.0000	0.0000
		***	***	***	**	***	***	***
With Con...	t-Statistic	-6.3056	-7.4361	-4.9153	-3.2898	-21.4810	-14.7889	-11.6572
	Prob.	0.0000	0.0000	0.0018	0.0851	0.0000	0.0000	0.0000
		***	***	***	*	***	***	***
Without C...	t-Statistic	-5.7659	-6.7510	-4.2403	-2.5925	-16.7567	-15.1637	-6.1835
	Prob.	0.0000	0.0000	0.0001	0.0111	0.0000	0.0000	0.0000
		***	***	***	**	***	***	***

(%10) * , (%5) ** , (%1) ***

When the Johansen test was conducted, it turns out that there are two approaches to co-integration, that is, there is a long-term equilibrium relationship. Therefore, these variables should have the VECM model. Using the 10.Eviews program, we obtained the long-term equation, We can write it after turning the signals because the equation in the VECM analysis takes the implicit form and when it returns to normal the signal volatility(3)

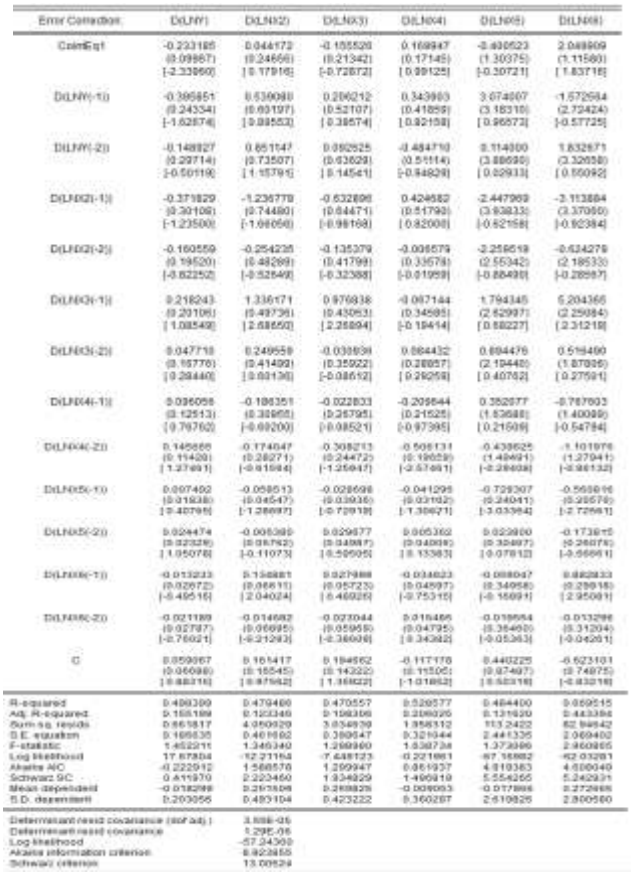
LNY=15.16905 + 0.666316LNX2(-1) - 1.098687LNX3(-1) +2.140315LNX4(-1) +0.104900LNX5(-1) +0.495682LNX6(-1)

t-statistics (2.22224) (-3.91474) (2.11384) (3.68846) (12.1499)

Shows (2) VECM short and long-term is variables (lny , lnx2 , lnx3 , lnx4 , lnx5 , lnx6)

Vector Error Correction Estimates
Date: 07/12/18 Time: 15:33
Sample (adjusted): 1983 2015
Included observations: 33 after adjustments
Standard errors in ( ) & t-statistics in [ ]

Cointegrating Eq:	CointEq1
LNY(-1)	1.000000
LNX2(-1)	-0.666316 (0.29984) [-2.22224]
LNX3(-1)	1.098687 (0.28065) [3.91474]
LNX4(-1)	-2.140315 (1.01252) [-2.11384]
LNX5(-1)	-0.104900 (0.02844) [-3.68846]
LNX6(-1)	-0.495682 (0.04080) [-12.1499]
C	-15.16905



We then estimate the short-term equation by using the OLS method and the VECM results as in Table (3)

Table Shows (3) test VECM variables (lny , lnx2 , lnx3 , lnx4 , lnx5 , lnx6)

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	-0.233185	0.099668	-2.339603	0.0304
C(2)	-0.395851	0.243341	-1.626736	0.1203
C(3)	-0.148927	0.297145	-0.501194	0.6220
C(4)	-0.371829	0.301076	-1.234998	0.2319
C(5)	-0.160559	0.195203	-0.822524	0.4210
C(6)	0.218243	0.201055	1.085489	0.2913
C(7)	0.047710	0.167757	0.284400	0.7792
C(8)	0.096056	0.125134	0.767621	0.4521
C(9)	0.145665	0.114282	1.274609	0.2178
C(10)	0.007492	0.018379	0.407650	0.6881
C(11)	0.024474	0.023291	1.050778	0.3065
C(12)	-0.013233	0.026724	-0.495160	0.6262
C(13)	-0.021189	0.027873	-0.760208	0.4565
C(14)	0.059067	0.066882	0.883155	0.3882

R-squared	0.498399	Mean dependent var	-0.018299
Adjusted R-squared	0.155199	S.D. dependent var	0.203056
S.E. of regression	0.186635	Akaike info criterion	-0.222912
Sum squared resid	0.661817	Schwarz criterion	0.411970
Log likelihood	17.67804	Hannan-Quinn criter.	-0.009293
F-statistic	1.452211	Durbin-Watson stat	1.634394
Prob(F-statistic)	0.223659		

Table (3) shows the significance of error correction at 5% and negative signal. This is in line with the economic theory and indicates a long-term equilibrium relationship in the model. The value of the error correction coefficient (0.233185) indicates that the area planted with the asphalt is adjusted to its equilibrium value A period of time approximately (23.31%) When the cultivated areas of the tomato crop deviate during the short term in (t-1) from their long-term equilibrium value, the equivalent of (23.31%) of the deviation in the current period (t)This indicates that the cultivated area of the crop takes about (4.3) years towards the equilibrium value after the impact of the shock in the model due to the change in explanatory variables , The results also showed that the price coefficient of the tomato crop, which represents the long-term price elasticity, is a positive sign and is consistent with the economic logic,While the negative and moral significance of the previous year's competitive crop price (-1.09868) reflects the competitive nature of the two crops. If the prices of the competing crops increase by 10%, the area planted with the tomato crop will decrease by 10.9% , As for

the elasticity of drainage of irrigation water, it came with a positive and moral signal (2.140315), indicating the relation between irrigation water and cultivated areas with a certain level of water. The signal of both production risk and price risk is positive and this is contrary to economic logic , (4) showed that the statistical value of F was (0.577329) at (0.5720) and x^2 (2.098840) at a probability level (0.3501) Therefore we will accept the null hypothesis that there is no problem of self-correlation as in Table (4)

Table (4) correlation LM test

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	0.577329	Prob. F(2,17)	0.5720
Obs*R-squared	2.098840	Prob. Chi-Square(2)	0.3501

The results revealed that the model was free from the problem of heterogeneity of variance using the Breusch-Pagan-Godfrey test. The multiple linear correlation problem was detected by using the VIF. If its value is greater than 10, 10 This indicates that there is no linear correlation problem. (6) It has been shown that there is no linear multiplication problem because the VIF value is equal to 1.96 and is less than 10 depending on the following law

VIF =1/ (1-R^2)

VIF= 1/ (1- 0.49)

= 1.96

The natural distribution of the Jarque-Bera booths was tested, indicating that the residues are distributed naturally because the probability value is greater than (5%) as shown in Figure (1).

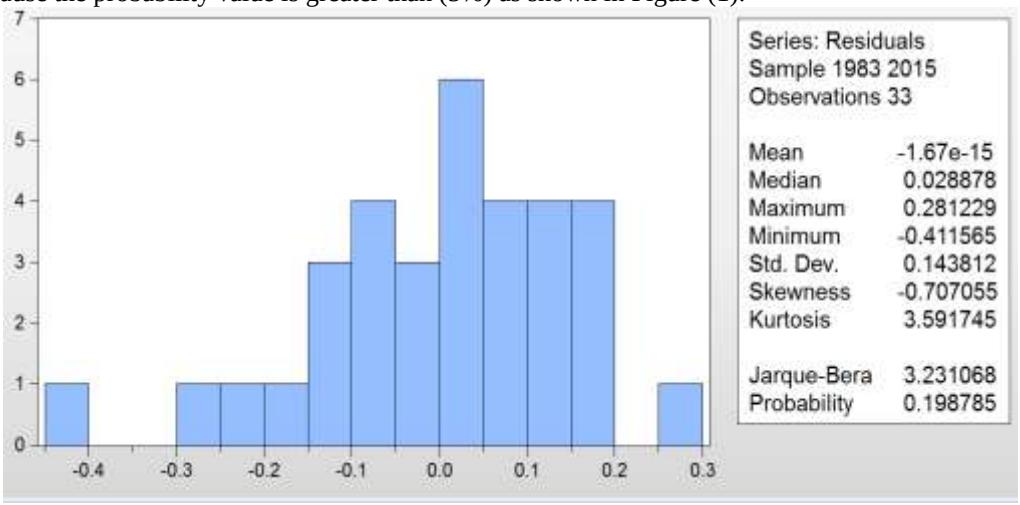


Figure (1) histogram – normality test

IV. Conclusions

1- There is an impact of the prices of crops competing for the crop of tomato and its impact was clear in the cultivated areas in the long term and this is consistent with the logic of economic theory.

2- It was clear through the study of the results of the unit root test that all the variables involved in the model were unstable at the original level and became stable after taking the first difference to them, as the ordinary methods of analysis of the false regression because it will not achieve the stability of variables and treatment of unstable, In order to avoid this, time series is analyzed using a common integration approach and error correction.

3- The value of the error correction coefficient (0.233185) indicates that the area cultivated by the tomato takes about 4.3 years towards the equilibrium value after the impact of the shock in the model due to the change in the explanatory variables.

V. Recommendations

1- Setting previous price policies to protect producers from fluctuating prices in order to increase cultivated areas and thus increase the production of the tomato crop.

2- For the purpose of increasing agricultural production, we must go to other aspects other than prices such as the manufacture of sauce, paste, pickles and others and thus work to encourage investment in the industrial field of agricultural crops.

3- the need to provide agricultural statistics for a long time series at the same pace and the same methodology and a degree of detail of the agricultural sector at the level of the provinces of the country, in terms of prices, areas, productivity and production.

Sources

[1]. Gujarati ,Damodar N. , 2004 , Basic Econometrics, 4th edition , The McGraw-Hill Companies.
[2]. Al-Qahtani, Safar and Subhi Ismail, 1999, Response of Protected Tomato Producers to Changing Market Conditions in the Riyadh Region, Saudi Arabia, MA Thesis, Department of Agricultural Economics, Faculty of Agriculture, King Saud University, Riyadh.
[3]. Gujarati ,Damodar N. , 2004 , Basic Econometrics, 4th edition , The McGraw-Hill Companies.
[4]. Mohammedi, FadelMusleh and Meshaal, Abdul JabbarJassim (1991) vegetable production, the Ministry of Higher Education and Scientific Research, Baghdad University College of Agriculture - Baghdad.
[5]. Rifai, Ahmed Hassan and Fayez JadallahMiqdad, 2016, Estimation of the response presentation of the most important vegetable crops in Syria, the Syrian Journal of Agricultural Research, No. 2, Volume 3.
[6]. Saleh, Muhammad Mahdi, 2016, Economic study to estimate the response and price fluctuations of maize corn in Iraq for the period (1980-2014), Master Thesis, Faculty of Agriculture, University of Baghdad. Unpublished .
[7]. shukr, Ali Salah, 2015, economic analysis to ensure the cost, profit and technical efficiency of the crop in the province of Diyala, University of Baghdad - Faculty of Agriculture - Department of Agricultural Economics, Journal of Agricultural Sciences of Iraq 46 (4).

Hajer Bader Ahmed. " Response to the presentation of cultivated areas of the tomato crop in Iraq for the period (2015-198)." IOSR Journal of Agriculture and Veterinary Science (IOSR-JAVS) 11.10 (2018): 18-22.