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Estimation of the supply function of corn crop in Iraq for the period (1990-2019)

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ABSTRACT

The corn crop is one of the main crops in Iraq and is of great importance in terms of food and industry, as it is used in the manufacture of corn flakes, starch, oil, etc., and is used as animal feed. The research aimed to estimate the supply function of the maize crop in Iraq for the period (1990 - 2019) and to determine the factors affecting the production of the crop, represented by the price and non-price factors. The Nerlov partial adjustment model was used for a set of explanatory variables, namely, corn production as a dependent factor, the price of the crop for the current and previous years, rains, corn production in the previous year, price risk, technology variable, and the qualitative variable represented by the economic blockade as independent factors. The method of least squares was used in the analysis of several functions including linear, double logarithmic, half logarithmic and inverse logarithmic. The results indicated that the double logarithmic function is the best in terms of its conformity with the logic of economic theory and statistical criteria. The value of the coefficient of determination R^2 was (0.89), and this indicates that the independent factors affect by (89%) the dependent variable, and that (11%) are due to other factors outside the model whose impact is absorbed by the random variable. The results of all parameters appeared significant according to the t-test at a level of significance (1%) to express the relationship between the dependent variable and the independent variables, and that the calculated F value is greater than the tabular F value, which amounted to (76.69), which indicates the significance of the model as a whole. The results indicated that corn supply is elastic in the short-run and inelastic in the long-run, which indicates that corn growers are less sensitive to price changes. And it was found that the supply of corn increases by (0.14, 0.19, 0.27) when the cultivated areas and prices of the current and previous year increase by one unit in order, and the research concluded that the supply of corn depends on several factors, the most important of which are prices in the current and previous year and the areas planted with the crop and to a lesser extent on the amount of rain. And the production of corn in the previous year and the technological factor and other factors despite their positive impact on the production of the crop. The study recommends adopting policies that focus on non-price factors as a means to stabilize and increase corn production.

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INTRODUCTION

Corn crop is considered as perhaps the most generally developed harvests around the globe since it is devoured by people both in immediate and circuitous manners (Dhla, 2008). Additionally, corn flour extricated from maize seeds can be incorporated inside the essential wheat flour at a level of (5-15%) to be utilized for human nourishment. This corn flour is removed from maize seeds, the last has a sugars level of (70-80%). Same seeds can be utilized to deliver vegetable oil since they contain (4%) of liquid oil that is credited for its nutritious and favorable to wellbeing highlights, not to miss upon its suitability as a green or potentially dried domesticated animals feed (Ali, 2008).

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Concerning the cobs of maize, they contribute to the creation of mash for paper creation (Al Obeidi, 2013).

The worldwide significance of maize is obviously showed through the worldwide pattern of generating environmentally friendly power using maize to fabricate biofuel (specifically; ethanol) realizing that the high paces of this harvest are the thing is really remaining against its wanted application. Talking just of the year 2006, the costs of maize soared to exceptional rates as the ethanol refining offices ate up fifth of the US maize all out creation (Ali, 2008).

With respect to Iraq, maize is viewed as one of not many major conservative yields of the nation, rating fourth close to wheat, grain and rice. The grounds misused for developing this crop vacillates all over starting with one year then onto the next. In 2013, an aggregate of 798,099 acres were misused, delivering around 831,299 tons of Yellow corn, however this figure soon dropped down in 2014 to 378,061 sections of land while the creation size leaped to 289,288 tons (FAO,2014). Out of every Iraqi region, Babylon starts things out according to the acreage utilized for developing Corn crop (Mahdi, 2010). Getting all around recognized, all things considered, and features of any affordable wonders or issue is a pivotal arrangement for an appropriate insight and treatment, be those angles immediate or roundabout, positive or negative. Along these lines, this investigation is ordered to incorporate the implications and ideas of both inventory capacity and supply reaction for pertinence issues.

Supply addresses the partner and free of interest with respect to determining the costs of merchandise on the lookout. Supply addresses is a type of a relationship connecting the amounts of merchandise that the makers can give and the various equal costs. This relationship is about an exchanging, fractional and minimal nature. As for the exchanging side of this relationship. This is on the grounds that supply identifies with the approaches of makers in the creation exchanging stage. This relationship is incomplete too since supply relates two essential parameters to one another: the amounts delivered and provided to the market on one side, and the costs on another. With respect to the third portrayal, this is on the grounds that supply is connected to the maker's conduct. A maker sees the products cost as a minor pay in the event that of complete free rivalry. A maker at that point compares the minor pay to the minimal expense to choose the best quantity to produce (Al Wardi, 2008).

Research Problem

Iraq is one of the developing countries that import maize in gross amounts to cover the local needs of this crop although its global prices are high. It is worth noting that the areas used to grow this crop had been seeing a lot of decrease due to price factors and non-price factors fluctuation and Statistics have been reflecting that the areas of plantation of this product increase in some year's and decrease in others.

Research objective

The research aims, in general, to estimate the supply function of the corn crop in Iraq for the period (1990-2019) by identifying the factors that affect the production of the crop, which are represented by price factors such as corn prices in the current and previous year, and non-price factors represented by the areas planted with the crop, the amount of rain, the technology variable and price risk In addition to the dummy variable represented by the economic blockade that the country is going through, and the derivation of short- and long-term flexibilities as a good indicator when making decisions that help in drawing agricultural policies related to the corn crop.

Research hypothesis

The research assumes that the supplied quantities of corn are negatively or positively affected by a number of price and non-price factors such as prices, the areas planted with the crop and other factors mentioned above.

MATERIALS AND METHODS OF WORK

The partial adjustment lagged model is considered appropriate for crop producers and is widely used by researches like Rao (1989), Belete (1995), Leaver (2004), Wasim (2005), Mythili (2008), to measure the producers behaviour.

Madlul et al(2020) showed that the Basic supply function, where quantity supply of maize is the function of price of maize and other factors, as follows:

$$Y = F(P,Z) \quad (1)$$

where: P = The price

Z = Other factors such as non-price variable and other.

Log linear transformation of equation (1) becomes:

The expected supply Y_t^* is:

$$\text{Log}Y_t^* = \alpha + \beta_1 \ln P_t^* + \beta_2 \ln Z_t + \dots + \beta_n \ln Z_{nt} + \varepsilon_t \quad (2)$$

where:

t = time period

P_t^* = expected price.

Nerlove introduces the expected price P_t^* into the model, in equation (3.2):

$$P_t^* = P_{t-1}^* + \lambda(P_{t-1} - P_{t-1}^*) \quad (3)$$

where:

P_t^* = expected price in period t .

P_{t-1}^* = expected price in period $t-1$.

P_{t-1} = real price in period $t-1$.

The current supply, Y_t

$$Y_t = Y_{t-1} + \delta(Y_t^* - Y_{t-1}) \quad (4)$$

Use equations (3.2) and (3.3) into equations (3.4) to get the reduced form of Nerlove model of supply response:

$$Y_t = a_0 + a_1 \ln P_{t-1} + a_2 \ln Y_{t-1} + a_3 \ln Y_{t-2} + \varepsilon_t \quad (5)$$

where:

a_0 = Intercept

$a_1, \dots, a_3$ = The coefficient of the factors.

If we include the non-price factors into the model, then the new model becomes short- run model of supply response:

$$\text{Ln}Y_t = a_0 + a_1 \ln P_t + a_2 \ln P_{t-1} + a_3 \ln Y_{t-1} + a_4 \ln A_{t-1} + a_5 \ln \hat{p}_t + a_6 \ln R_t + a_7 T_t + a_8 D_t \quad (6)$$

where:

Y_t = Production of maize in time t (dunum)

P_t = Maize price (dinar/kg)

P_{t-1} = One year lag price of maize (dinar /kg)

y_{t-1} = Yield of maize with one year lag (ton/ dunum)

R_t = Average rainfall in mm with one year (mm)

A_{t-1} = Area under maize with one year lag (dunum)

∂P_t = Price risk

D_t = Dummy variable (the siege)

T_t = Technology

$\ln$ = Natural log

For the long run price elasticity of the model could be adduced as follows:

$$E = \beta_1 \frac{\bar{P}}{\bar{Y}} = \frac{a_1}{1 - a_2 - a_3} \cdot \frac{\bar{P}}{\bar{Y}} \quad (7)$$

Research Data Resources

Multiple resources contributed to providing access for databases pertaining to prices, acreage, production taken from the ministry of agriculture and total annual rainfall taken from environment.

RESULTS AND DISCUSSION

Estimating functions supply response to the Corn crop in Iraq during the period from (1990 – 2019)

Studying the relationship between the total production of the Corn as the dependent variable and explanatory factors that impact on this variable is thought such special crop the same farm in the previous and current year Price cultivated area in the current year and the amount of rainfall and the amount of production of corn in the previous year and Price risk, technology and variable economic blockade as a variable qualitative using a form Nerlov

Showing Corn crop in Iraq using a form Nerlov and explanatory variables for the crop using different formulas Function

Table data show (1) to display the results of estimating functions Corn crop using a form Nerlov next to standards and standard tests that show a lack of measurement problems in the estimated models during the study period (1990-2019) It has been estimated functions supply response as total Production of Corn on the in this year's function in the cultivated Corn area, as well as variable farm Price in the current year and the period of delay of one year and the amount of rain and the amount of production of Corn a period of delay of one year and Price risk, technology and variable economic blockade as a variable qualitatively using Ordinary Least Square formats and different Function included linear formula and formula logarithmic and double logarithmic formula half and found that the double logarithmic formula is the best formulas to estimate the response function display Corn crop in terms of compatibility with economic and statistical standards

The results of the above table that the coefficient of determination R^2 of the relationship logarithmic double explains about (89%) of the changes in the dependent variable (total Corn production), and that the value of F calculated for the sample as a whole is greater than the value of F spreadsheet which confirms the moral model fully and t calculated explanatory variables in model larger than the value t spreadsheet in the abstract level of (0.01) that is, all the explanatory entering variables in the model significantly, but it is clear that the value of Durbin Watson coefficient less than the value of the coefficient of determination that would cause there is a possibility of the existence of a false correlation between the model variables, which requires a test of independence

Table (1) the results of the statistical estimation of multiple regression equations between the production of the Corn crop as the dependent variable and the variables under study independent variables using various formulas Function

D.W	F	R ²	Formula	Function
0.759	62.26**	0.82	Y = 22.3 + 0.13 X + 0.17 P + 0.21 P _{t-1} + 0.09 R + 0.12 PR _{t-1} + 0.07 PD - 0.05 D + 0.08 T (5.36**) (5.19**) (6.36**) (4.56**) (4.66**) (4.69**) (4.36**) (3.96**)	Linear
0.852	76.69**	0.89	LN Y = 23.9 + 0.14 LN X + 0.19 LN P + 0.27 LN P _{t-1} + 0.1 LN R + 0.08 LN PR _{t-1} + - 0.06 LN D + 0.06 LN T 0.11 LN PD+ (4.69**) (5.36**) (5.96**) (5.69**) (4.86**) (4.56**) (3.86**) (5.38**)	double logarithmic
0.815	55.69**	0.85	Y = 23.5 + 0.12 LN X + 0.17 LN P + 0.22 LN P _{t-1} + 0.11 LN R + 0.09 LN PR _{t-1} + - 0.05 LN D + 0.08 LN T 0.11 LN PD+ (5.66**) (4.99**) (4.62**) (6.59**) (5.29**) (3.99**) (4.25**) (3.26**)	half logarithmic In the independent variable
0.808	68.29**	84.0	- 0.07 D + 0.09 T 0.09PD+ LN Y = 22.8 + 0.11 X + 0.15 P + 0.23 P _{t-1} + 0.13 R + 0.11 PR _{t-1} (4.26**) (4.56**) (3.26**) (5.46**) (4.96**) (3.52**) (4.66**) (3.59**)	Half logarithmic In the dependent variable

Significance in (0.01)**

Where:

Y = the production of corn

X = cultivated area of the corn crop

P = the price of the crop in the current year

P_{t-1} = price of the crop in the previous year

R = amount of rain in year

PR_{t-1} = production of corn in the previous year

PD = Price risk

D = variable economic blockade and takes values 0 or 1 (1 From 1990 – 2003)

T = Technology variable

Test stability of time-series supply of Corn in Iraq function:

We tested the stability of time-series variables function supply Corn each variable separately tested Dickey Fuller enlarged the roots of unity based on the following equation:

$$\Delta Y_t = b_0 + b_1 T + \delta Y_{t-1} + a \sum^m \Delta Y_{t-1} + \varepsilon_t$$

Where:

b0 constant equation, T Time trend, determine the number of periods and optimal appreciation delay ordinary least squares results were as follows:

Table (2) Dickey Fuller test for the enlarged supply function Corn

D.W	t tau	α	Delay Optimization	Variables
2.09	**6.11-	-1.52	3	Supply of Corn
2.07	-6.23**	-1.65	1	cultivated area
1.95	- 6.28**	-1.49	1	the Price of the crop in the current year
2.02	-6.11**	-1.69	1	Price of the crop in the previous year
1.95	-5.56**	-2.1	1	amount of rain this year
1.86	-6.02**	-1.7	1	Price risk
1.94	-5.69**	-1.61	1	production of Corn in the previous year
1.93	**5.26-	-1.49	1	Technology variable

Significance in (0.01) **

The results of the tests unit root using Dickey test - Fuller expanded (ADF) and by comparing the value of the Dyke Fuller t tau (Tau) calculated with Mackinnon table values, the results indicate rejection of the null hypothesis of the absence of time series of unit root when the difference.

As well as the free form of the autocorrelation problem by test d.w Therefore, the area and the current Price and the Price in the previous year and the amount of rain, productivity and Price risk in the previous year and technology are complementary top-tier So stable time series after taking the first difference.

Upon accepting the alternative hypothesis, we test the joint integration time series to Showing Corn function after estimating residuals in the equation we get the following results:

Table (3) joint integration testing to Showing Corn function

d.w	t tau	α	lag Optimization
1.79	-4.97**	-1.45	2

We reject the null hypothesis and accept the alternative theory any $\delta \neq 0$ because t tau calculated (4.97) was greater than the spreadsheet at the moral level of (0.05, 0.01) So the estimated Overstocks do not contain any static roots of unity In other words, the existence of a joint integration between the time-series variables any presence of a long-term relationship between the variables.

Spearman's Rank Correlation Test

The partial correlation coefficients between independent variables account Table (4) And shows a lack of self-correlation problem first-class between the independent variables.

Table (4) The partial correlation coefficients between the independent variables

T	PD	PR t-1	R	Pt-1	P	X	Variables
----	----	---	----	----	----	1	X
----	----	----	----	----	1	0.22	P
----	----	----	----	1	0.08	0.18	Pt-1
----	----	----	1	0.07	0.16	0.09	R
----	----	1	0.13	0.15	0.19	0.16	PR t-1
	1	0.13	0.26	0.16	0.25	0.11	PD
1	0.07	0.14	0.12	0.08	0.23	0.14	T

Significance in 0.05 Non

Detection Multicollinearity using variance inflation factor (VIF)

Multicollinearity was detected using the test (VIF) shows there is no problem of double paced between the independent variables where it was found that the value of (VIF) coefficient of less than (10).

The most important crop corn and affecting production and economic variables

The results contained in Table (5), which describes the simple production of Corn in the current year regression variable equations continued with the study subject of independent variables to Corn production significantly affected by both the cultivated area of the Yellow corn, the Price of the crop in the current year, the Price of the crop in the previous year, the amount of rain this year, the amount of production in the previous year, the risk of Price, technology, economic blockade, reaching the coefficient of determination about (0.59, 0.73, 0.76, 0.56, 0.68, 0.61, 0.63, 0.51) each, respectively, which indicates the influence of these variables the dependent variable.

Table (5) the results of the statistical estimate of the simple regression equations between the current output as the dependent variable and changes the subject The study as independent variables

F	R ²	T	β	α	independent variable	dependent variable
**10.24	0.59	**3.2	0.43	23653.2	x	Y
**21.61	0.73	**4.6	0.69	45236.3	P	
**18.49	0.76	**4.3	0.75	45623.2	P_{t-1}	
**23.04	0.56	**4.8	0.49	56235.3	R	
**12.96	0.68	**3.6	0.45	14562.3	PR_{t-1}	
**27.04	0.61	**5.2	0.41	23653.3	PD	
**16.81	0.63	**4.1	0.46	12565.3	T	
**13.69	0.51	**3.7	-0.07	21546.3	D	

Significance in (0.01) **

Flexibility transactions also estimated at (0.43, 0.69, 0.75, 0.49, 0.45, 0.41, 0.46, -0.07) each of them, respectively, which already indicates by estimating functions to respond to change these factors one unit leads to a change of cultivated Corn in the current years' worth of space this flexibility / ton, which means that Corn production greatly affected the price of the Corn crop in the previous year Indicate the equation No. 1 in Table No. (5) that about (59%) of the changes in Corn production due to changes in the acreage of the crop and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing the acreage of Corn acres consequent increase in Corn production in the next year by (0.43) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (5) to be flexible in response to supply the Corn has reached in both the short and long about (0.69, 0.39) respectively. This shows that the increase in the area planted by (1%) leads to increase production by (0.69% , 0.39%) respectively as (0.57) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (1.75) years starting from next year for agriculture.

Indicate the equation No. 1 in Table No. (5) that about (73%) of the changes in Corn production due to changes in The Price of the crop in the current year and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing Increase the Price per ton of Corn crop one dinar consequent increase in Corn production in the next year by (0.69) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (0.00063, 0.00019) respectively. This shows that The increase in the Price of the crop by (1%) leads to increase production by (0.00063%, 0.00019%) respectively as (0.31) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (3.23) years starting from next year for agriculture

Indicate the equation No. 1 in Table No. (5) that about (76%) of the changes in Corn production due to changes in The Price of the crop in the previous year and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing Increase the Price per ton of Corn crop in the previous year and one-dinar consequent increase in Corn production in the next year by (0.75) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (0.00068, 0.00017) respectively. This shows that The increase in the p_{corn} of the crop in the previous year by 1% leads to increase production by (0.00068%, 0.00017%) respectively as (0.25) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (4) years starting from next year for agriculture.

Indicate the equation No. 1 in Table No. (5) that about (56%) of the changes in Corn production due to changes in The amount of rain this year and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing Increase the amount of rain one mm consequent increase in Corn production in the next year by (0.49) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (0.00471 , 0.00240) respectively. This shows that The increase in the amount of rain by 1% leads to increase production by (0.00471% , 0.00240%) respectively as (0.51) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (.196) years starting from next year for agriculture.

Indicate the equation No. 1 in Table No. (5) that about (68%) of the changes in Corn production due to changes in Production in the previous year and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing Increase production in the previous year to one-ton consequent increase in Corn production in the next year by (0.45) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (0.44863, 0.24675) respectively. This shows that The increase in production in the previous year by (1%) leads to increase production by (0.44863%, 0.24675%) respectively as (0.55) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (1.82) years starting from next year for agriculture.

Indicate the equation No. 1 in Table No. (5) that about 61% of the changes in Corn production due to changes in Risk p_{corn} and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing the p_{corn} risk by the unit consequent increase in Corn production in the next year by (0.41) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about 0.00171 , 0.00101 respectively. This shows that The increase in the p_{corn} of risk by (1%) leads to increase production by (0.00171% , 0.00101%) respectively as (0.59) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (1.69) years starting from next year for agriculture

Indicate the equation No. 1 in Table No. (5) that about 63% of the changes in Corn production due to changes in Technology and the rest of the changes to factors other than the measured model, has proved to be significantly model statistically at (1%). The results show that increasing Increase technological progress consequent increase in Corn production in the next year by (0.46) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (0.00002 , 0.00001) respectively. This shows that Increase technological progress by 1% leads to increase production by (0.00002% , 0.00001%) respectively as (0.54) years annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (1.85) years starting from next year for agriculture.

Indicate the equation No. 1 in Table No. (5) that about (51%) of the changes in Corn production due to changes in Economic blockade and the rest of the changes to factors other than

the measured model, has proved to be significantly model statistically at (1%). The results show that increasing the duration of the economic blockade by the year reduces consequent decreases in Corn production in the next year by (0.07) tons, assuming other factors firming at a certain level.

The results indicate estimate the elasticity of supply response in Table No. (6) to be flexible in response to supply the Corn has reached in both the short and long about (-0.000001, -0.000001) respectively. This shows that Increase the range of economic blockade by the year by 1% leads to decreases production by (0.000001% , 0.000001%) respectively as (1.07) year's annual response coefficient as well as the required period amounted to achieve full response to the farmer reached about (0.93) years starting from next year for agriculture.

Table (6) elasticity of supply response short and long term and the coefficient and the full response of the explanatory variables for the Corn crop in the period from (1990 – 2019)

Models								Variable
D	T	PD	PR _{t-1}	R	P _{t-1}	P	X	
1.07	0.54	0.59	0.55	0.51	0.25	0.31	0.57	The annual coefficient of response 1- B
0.93	1.85	1.69	1.82	1.96	4.00	3.23	1.75	Full respon period 1 / (1 –B
-0.000001	0.00002	0.000171	0.44863	0.00471	0.00068	0.00063	0.69	Pcorn elasticity i the short te E1 = B * X
-0.000001	0.00001	0.000101	0.24675	0.00240	0.00017	0.00019	0.39	Pcorn elasticity in the Lon term E2 = E1 * (B)

Show that there was a significant response statistically in Corn production to the changes occurring in the space variables planted Yellow corn, the price of the crop in the current year, the price of the crop in the previous year, the amount of rain this year, the amount of production in the previous year, the risk of price, technology, economic blockade and that a longer period was in response to the price of the crop in the previous year, and the price of the crop in the current year, followed by the amount of rain this year, and technology, production in the previous year, the cultivated area of the Corn crop in the previous year, the risk of price and finally the economic blockade.

CONCLUSION AND RECOMMENDATION

The research concluded that the supply of corn depends on several factors, the most important of which are prices in the current and previous year and the areas planted with the crop and to a lesser extent on the amount of rain and the production of corn in the previous year and the technological factor and other factors despite their positive impact on the production of the crop.

Based on the above limits, future experimental examination is called for to extend the investigation. The current investigation structure might be added to and reached out to strengthen the discoveries and beat the limits. The examination factors might be used in various yields like the wheat, grain and rice.

Besides, the discoveries may contrast when considered in other conduct gatherings. This indicates a requirement for future investigations to lead cross-conduct examination to decide whether or not ranchers have a similar conduct everywhere on the globe, or whether Iraqi ranchers are special because of their conduct.

This investigation was directed utilizing public authentic time arrangement information which can be restricting. It is, in this manner, crucial for future examinations to limit to cultivate level investigation to catch family unit aspects, for example, specialized productivity and financial portrayal of ranchers utilizing cross-sectional information. This examination did exclude input cost factors on account of inaccessibility of information. In this manner future investigations ought to incorporate more informative factors like expenses of compost, workforce and seed as they have the impact on maize supply. An institutional examination of components influencing maize creation ought to likewise be concentrated later on to accept issues, for example, market access to assess the effect of institutional exercises particularly in the post-attack period.

There is likewise need for additional investigation to zero in on the proportions of security and government assistance impacts of different rural approaches on maize creating family units. There is additionally need for additional investigations to quantify the level of incorporation utilizing high recurrence information instead of the yearly information utilized in this examination. The high recurrence information could be month to month or week by week exchange information which was found to give more exact flexibilities. Low recurrence information has been found in writing to overestimate value transmission flexibilities.

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تقدير دالة العرض لمحصول الذرة في العراق للمدة (1990-2019)

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الخلاصة

يعد محصول الذرة من المحاصيل الرئيسة في العراق وله أهمية كبيرة من الناحية الغذائية والصناعية، إذ تدخل في صناعة رقائق الذرة والنشا والزيت وغيرها وتستخدم كأعلاف للحيوانات. استهدف البحث تقدير دالة العرض لمحصول الذرة في العراق للمدة (1990 - 2019) وتحديد العوامل المؤثرة على إنتاج المحصول والمتمثلة بالعوامل السعرية وغير السعرية. تم استعمال نموذج التعديل الجزئي لنيرلوف لمجموعة من المتغيرات التوضيحية وهي إنتاج الذرة كعامل تابع وسعر المحصول للسنتين الحالية والسابقة والأمطار وإنتاج الذرة في السنة السابقة والمخاطرة السعرية ومتغير التكنولوجيا والمتغير النوعي المتمثل بالحصار الاقتصادي كعوامل مستقلة. تم استخدام طريقة المربعات الصغرى في التحليل لعدة دوال شملت الخطية واللوغاريتمية المزدوجة ونصف اللوغاريتمية ونصف اللوغاريتمية المعكوسة. أشارت النتائج أن الدالة اللوغاريتمية المزدوجة هي أفضل الدوال من حيث مطابقتها لمنطق النظرية الاقتصادية والمعايير الإحصائية. بلغت قيمة معامل التحديد R^2 (0.89) وهذا يشير إلى أن العوامل المستقلة تؤثر بنسبة (89%) على المتغير التابع، وإن (11%) تعود لعوامل أخرى خارجة عن الانموذج امتص أثرها المتغير العشوائي. ظهرت نتائج جميع المعلمات معنوية وفقاً لاختبار t عند مستوى معنوية (1%) لتعبر عن العلاقة بين المتغير التابع والمتغيرات المستقلة، وأن قيمة F المحسوبة أكبر من قيمة F الجدولية، إذ بلغت (76.69) إذ تدل على معنوية الانموذج ككل. وأشارت النتائج إلى أن عرض الذرة مرن على المدى القصير وغير مرن على المدى الطويل، مما يدل إلى أن مزارعي الذرة أقل حساسية لتغيرات الأسعار. وتبين أن عرض الذرة يزداد بمقدار (0.14، 0.19، 0.27) عند زيادة المساحات المزروعة وأسعار السنة الحالية والسابقة بمقدار وحدة واحدة حسب الترتيب، واستنتج البحث أن عرض الذرة يعتمد على عدة عوامل أهمها الأسعار في السنة الحالية والسابقة والمساحات المزروعة بالمحصول وبدرجة أقل على كمية الأمطار وإنتاج الذرة في السنة السابقة والعامل التكنولوجي وعوامل أخرى على الرغم من تأثيرها الإيجابي على إنتاج المحصول. توصي الدراسة باتباع سياسات تركز على العوامل غير السعرية كوسيلة لتحقيق الاستقرار في إنتاج الذرة وزيادته.

الكلمات المفتاحية:

دالة العرض ، محصول الذرة ، نموذج نيرلوف.