



# ECONOMIC AND ECONOMETRICS ANALYSIS OF THE MOST IMPORTANT FACTORS AFFECTING THE INVESTMENT ALLOCATIONS FOR AGRICULTURAL RECLAMATION IN IRAQ FOR THE PERIOD 1990 - 2017

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## Abstract

In this research, the study of (the standard and economic analysis of the investment allocations for agricultural land reclamation in Iraq for the period between 1990-2017) has been conducted and the aim of the research is to assess the effect of the investment allocations In the reclamation of agricultural land in Iraq, knowing the affecting factors during the study period, making an economic analysis for the size of investment in reclamation and specifying a number of the affecting factors in it such as the gross national product, the agricultural product and the reclaimed lands, the results and discussion include, describing the methods used in the econometrics model after testing the stability of time series of the study variables by using statistical program (E views 9), the estimation of the regression model of investment customization by using the distributing delay self-regression (ARDL). The study reached several conclusion that the product variable was positive, *i.e.*, the increase in agricultural product in the rate of (1% ) the investment allocations in the rate of (20.85%) in the short - term, that is by the increase of the agricultural product in the long - term in the rate of (10.97%). The gross nation product GDP variable showed a negative and moral effect in the short and long term. it is contrary to the economic logic that (ei) is by increasing gross national product (GDP) the investment allocations decrease in the short term in the rate of (-0.90%) and in the long term decrease in the rate of (-0.22%). While the variable of the reclaimed area in the short term has been negative and non-significant increase in reclaimed areas in the rate of (1%) investment allocations fall in the short term in the rate of (- 0.0066%). As for the long-term, it has been positive effect conform to economic logic. It increases in the rate of (0.0279%). After one year, it will become significant but negative effect. The error equation has been negative and significant (has met the necessary and sufficient condition); meaning that there is a long-term balanced relationship among the variable of the study.

**Key words:** Economic, investment, agricultural reclamation.

## Introduction

The agricultural sector is one of the important and vital economic sectors and it occupies the third place after the oil and service sectors through its participation in the gross national product. The importance of the agricultural sector in the gross national product constitutes (23%) during the period of study. Investment in the agricultural sector works on increasing the productivity of the agricultural sector that is developing the productive power, providing new job chances, renewing buildings and agricultural establishments and the addition of land resources through the reclamation, use of agricultural mechanization and modern method agriculture as well as

developing animal, plant agricultural productive potentialities. Investment works to increase the capital reserves, which is one of the basic props of economic growth and than correction of structural imbalances by raising the percentage contribution of productive sectors, including the agricultural sector in gross domestic product (GDP) (Hamza *et al.*, 2017). Investment is the main factor and the engine is the foundation of the wheel of economy and development in any society. Therefore, all countries of the world, In different political and economic systems and the degree of economic progress and wealth of investment are very careful, always strive to achieve high and continuous rates of investment. The continuation of investment and at a rising rates is the only one that

can accelerate the growth and achieve the objectives of the society and its economic and social ambitions, especially with regard to expanding its productive base and increasing production. Thus increasing national income levels and average per capital income, so as to achieve the ambitions of individual human or groups in life for the better and to improve the quality and level of life in general (Morocco, 2011: 19). Investment in reclamation land is considered of the activities conducted by the general sector in most countries of the world. Sums of money are allocated and spent on various economic sectors to develop the gross national product. In 1992 the area of the reclaimed lands by the Iraqi ministry of irrigation and ministry of agriculture reached 2.5 million hectares which caused the agricultural land to develop (Al-Samurai, 1995: 1). The total area of Iraqi territory is (438.320) square kilometers. It consists of the alluvial plain of the lands of Mesopotamia between the Tigris and the Euphrates (Foods and agriculture organization 2012), to the east and north mountains surround this plain of (3.550) kilometers above sea level, to the south and west there are desert lands which form (40%) of the agriculture lands and more than (90%) of the lands of the country are arid and semi - arid areas (Quraishi *et al.*, 2015). The total geographic area of Iraq is (45) million hectares, (34) million hectares shape ratio (78%) of it are not arable lands in the current circumstances. According to the estimations of the Organization of Foods and Agriculture, the cultivated lands in Iraq are (6) million hectares, (50%) of these lands are located to the north of Iraq which depend on rain while the rest are irrigated. Surface irrigation methods are used on a large scale to irrigate crops (Organization of Foods and Agriculture, 2012).

### Importance of the Research

Productive investment in the reclamation of the Iraqi agricultural lands represents a priority of the basic priorities for economic growth and the developing the main structures of the agriculture sector *via* vertical and horizontal expansions or both of them. Horizontal expansion aims at increasing the cultivated land by the addition of new lands that can produce crops. Vertical expansion means increasing the productive excellence of the cultivated lands *via* improving the quality of the cultivated lands and achieving higher rates and desalinating the Iraqi lands.

### Problem of the Research

The fall in the participation of the agricultural sector in the gross national product and the fall in the rates of the agricultural product in Iraq and the bad productivity level represent an indicator for the decrease in the rates

of investment which practises a main role in achieving the material accumulation that is necessary for the agricultural product.

### Aims of the Research

1. Estimating the effect of the investment allocations in the reclamation of the Iraqi agricultural lands and knowing the affecting factors in it throughout the study period (2017-1990).

2. Conducting an economic and econometrics analysis of the investment size in the reclamation of and specifying some factors that affect it such as the gross national product, agricultural product and the reclaimed lands.

### The Hypothesis of the Research

Independent variables affect of the agricultural product by the fixed prices and the reclamation lands (donam) affect positively on the investment allocations for the projects of reclaiming agricultural lands and independent variables of the gross national product with fixed prices affect negatively on the investment allocations.

### Research Methodology

1. The quantitative and descriptive style is employed. And by using the distributing delay self-regression (ARDL) after testing the extent of the stability of time series of the variables of the study by using statistics program (E views 9).

2. Conducting statistic tests and the related standard economic tests *via* considering the investment allocations of the projects of agricultural land reclamation as a related variable (Y) dependent variable and the independent factors are represented by:

$X_1$  = the value of the agricultural product with fixed prices (million dinars).

$X_2$  = the gross national product with fixed prices (million dinars).

$X_3$  = reclaimed areas (donams).

## Materials and Methods

### Notion of Investment

Investment is the employment of funds available in a variety of assets to obtain more financial flows in the future and these flows is compensation received by the investor instead of using these funds by other investors for the length of time that the investor abandons the capital. Taking into account the achievement of returns covering the value of the required compensation as well as the risks arising from the uncertainty in obtaining expected future inflows and exceeding the rate of inflation Investment is defined as employing the product for the

capital *via* directing savings towards usages that lead to the production of commodity or services that meet the economic needs for the society and increase its welfare. It is that part of income that is not yet consumed and reinvested in the production operations for the purpose of increasing or expanding or preserving the product to makes it achieve in a real addition to the economy of the country (Shabeeb, 2009: 15-17).

Investment is based on sacrifice by satisfying the wish of the consumer for the time being not to be postponed in order to get a greater satisfaction in the future or it is to abandon sums of money one has in a certain period of time and a specific period of time to get some money that compensates the current value of the invested money as well as the expected shortage of the purchasing value due to the inflation factor with providing reasonable returns in return for bearing the risk element represented in the possibility of the absence of these flows (Mutar, 2013: 22).

### Reclamation of Agricultural Lands

This notion is a collection of measures and preservations that improve the soil and reserve and increase the fertility of the soil. Reclamation of agricultural lands aims at exploiting the soil as a medium to grow agricultural crops and dealing with the problems of the soil so as to increase the agricultural product and make the soil arable. Reclamation of lands is necessary in order to increase the agricultural lands *via* horizontal or vertical expansion in the cultivated lands (Al-Zubaidi, 1994: 26). Projects of reclamation of Iraqi agricultural lands started during the 1950s with the establishment of the building council in 1950 and the integral reclamation was implemented for Al-musaib project (Ministry of Water Resources, 2007).

## Results and Discussion

### • Stability Testing of Time Series:

Time series according to the stability feature is divided into:

1. Stable chains: chains that change over time, without changing the average over a relatively long period of time, *i.e.*, there is no general tendency to increase or decrease both (does not contain the root of the unit).

2. Unstable chains: chains whose average is constantly changing, increasing or decreasing (containing the root of the unit).

The following steps can be followed to estimate the ARDL model

1. Testing the stability of the time series and

determining the rank of integration. There are many ways (tests) to do this test and the expanded test of Diki-Foler extended (ADF) and that of Philips-Beron (PP), were selected and the criterion of Schwarz (SIC) was relied on in the test operation and Pesaran views it as the best criterion in the stability test.

2. Initial test of model (ARDL) for the short term by using (OLS).

3. Conducting a test to whether there is a long-term relationship of common integration by using (Bound Test) in the (ARDL) sample (Gebrehiwot, 2014: 70).

4. Estimating long-term and short-term coefficients (fault correction sample) which can be estimated according to the following form (Pradhan *et al.*, 2013: 914):

$$\Delta(Y_t) = c + \lambda Y_{t-1} + \beta X_{t-1} + \sum_{i=1}^n a_1 \Delta(Y_{t-i}) + \sum_{i=0}^m a_2 \Delta(X_{t-i}) + \mu_t$$

Whereby:

$\Delta$ : represents the first difference

c: represents the fixed limit

n, m: represent the highest limits of the periods of time delay of the independent variables and the dependent variable.

$\lambda$ : represents the coefficient (sign) of fault correction (amendment or adaptation) (Coint Eq (-1)) which is the percentage of the faults of the short-term kind that can be corrected in the unit of time and so as to return to the position balance. There are two conditions for this coefficient (sign) so as to correct the short-term faults, that is a negative and significant value (the sufficient and necessary condition).

$\beta$ : represents the coefficients (signs) of long-term sample

$a_1, \dots, a_2$ : long-term coefficients (signs)

i: time

$\mu_t$ : represents the random fault

5. The Test of a model with no self-correlation problem via test (Breusch-Godfrey Serial Correlation LM Test).

6. Testing contrast with no analogy by using (Heteroskedasticity Test: Breusch - pagan - Godfrey)

7. Testing the safety and stability of the model *via* test (CUSUM Squares), (Gebrehiwot, 2014: 70).

### General description of the study variables using the ARDL model

In this analysis, the multiple regression model that has been applied to the investment allocations as a

**Table 1:** The results of the Extended Decryler test of the time series stability.

The expanded test of Diki Foler (ADF)									
Vector	Testing	At the first difference				At the level			
		X <sub>3</sub>	X <sub>2</sub>	X <sub>1</sub>	Y	X <sub>3</sub>	X <sub>2</sub>	X <sub>1</sub>	Y
Only interrupting	t-Statistic	8.2149	7.0985	6.9232	7.4122	3.5861	0.7440	2.5732	1.6032
	Prob.t	0.0000	0.0000	0.0000	0.0000	0.0130	0.8187	0.1107	0.4668
	Stationarity	***	***	***	***	**	NO	NO	NO
Segmentation and general direction	t-Statistic	8.0754	6.9557	7.4568	7.7283	3.5301	3.7752	1.3855	2.0066
	Prob.t	0.0000	0.0000	0.0000	0.0000	0.0561	0.0340	0.8402	0.5717
	Stationarity	***	***	***	***	*	**	No	No
Without cutting and general direction	t-Statistic	8.3751	6.4268	6.9308	7.5366	0.7741	0.5937	0.5484	0.5621
	Prob.t	0.0000	0.0000	0.0000	0.0000	0.3710	0.8384	0.8277	0.4639
	Stationarity	***	***	***	***	no	no	No	No

Source: Prepared by the researcher depending on the outputs of the program (Eviews.9)  
 Note: (\*) At a significant level of 10%, (\*\*) at a significant level of 5%, (\*\*\*) at a significant level of 1%, (no) is insignificant.

dependent factor has been taken into account in which the independent variables, agricultural product, gross national product GDP and reclaimed areas, are affected. The general form of this model is as follows:

$$b_3x_3+u_{i-2}Y=a_0+b_1x_1+b_2x_2$$

Where:

Y = dependent variable (investment allocations).

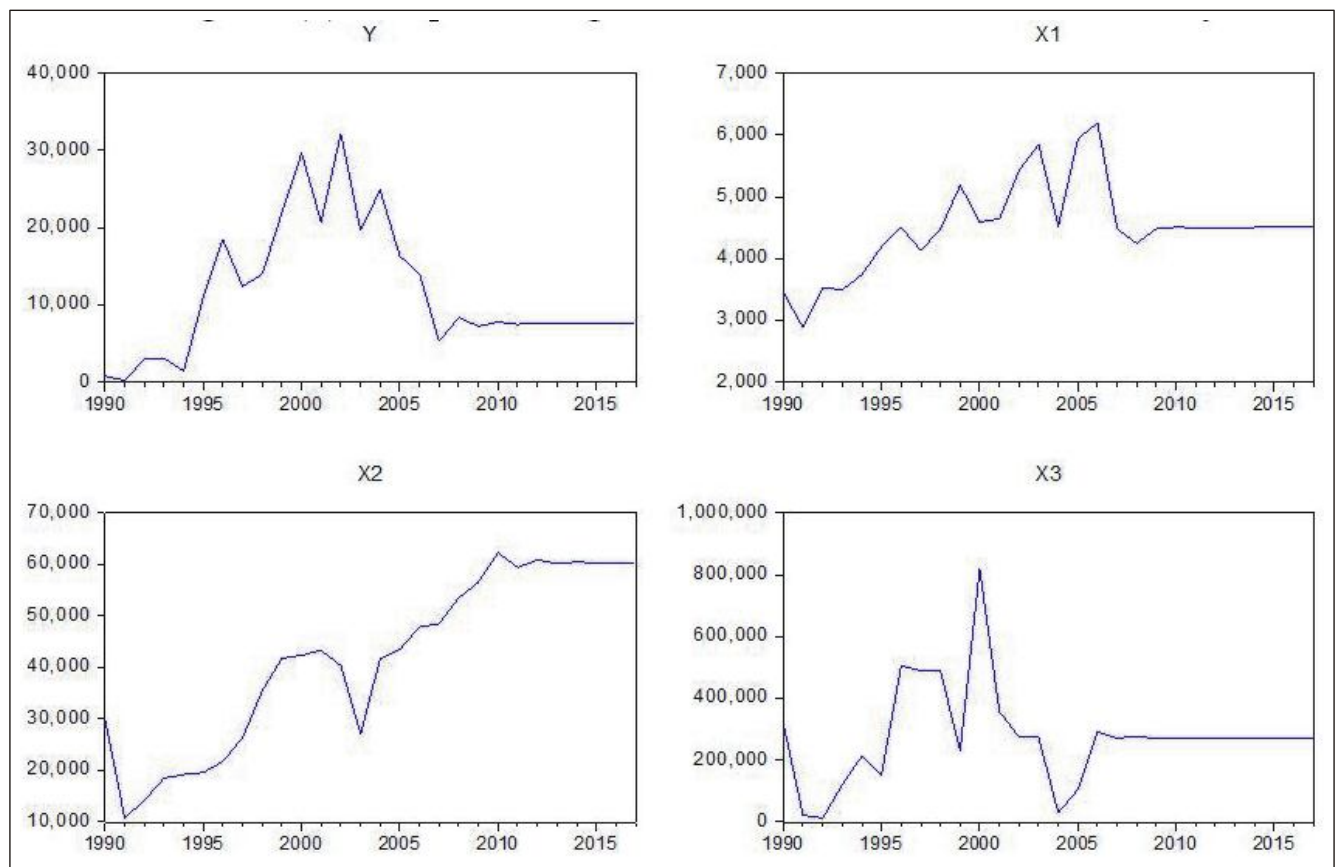
The independent variables are:

X<sub>1</sub> = Value of agricultural output (million dinars).

X<sub>2</sub> = Value of Gross Domestic Product (Million JD).

X<sub>3</sub> = Reclaimed areas (dunums).

U<sub>i</sub> = random variable (error limit).



**Fig. 1:** Graphic Diagram of the Variables of the Study.

Source: Prepared by the researcher depending on the outputs of the program (Eviews.9); Note: The vertical axis is the dependent variable (Y) and the independent variables (X3, X2, X1) for the study variables and for the four shapes in order from the top left to the lower right and the horizontal axis representing the years in duration (1990-2017).

**Table 2:** Results of the preliminary test of the ARDL model for the study variables.

Dependent Variable: Y; Method: ARDL; Date: 08/01/18, Time: 11:33; Sample (adjusted): 1994 - 2017; Included observations: 24 after adjustments; Maximum dependent lags: 4 (Automatic selection); Model selection method: Akaike info criterion (AIC); Dynamic regressors (4 lags: automatic): X1 X2 X3; Fixed regressors: C; Number of models evaluated: 500; Selected Model: ARDL (3, 3, 4, 4).				
Variable	Coefficient	Std. Error	t-Statistic	Prob.*
Y(-1)	-0.685179	0.215918	-3.173324	0.0192
Y(-2)	-1.393726	0.212386	-6.562224	0.0006
Y(-3)	-1.539537	0.186765	-8.243184	0.0002
X1	20.85461	2.272066	9.178702	0.0001
X1(-1)	8.631198	1.559819	5.533463	0.0015
X1(-2)	13.85577	1.690782	8.194888	0.0002
X1(-3)	7.348850	0.960939	7.647572	0.0003
X2	-0.900916	0.151513	-5.946126	0.0010
X2(-1)	-0.013846	0.138087	-0.100269	0.9234
X2(-2)	-0.062415	0.143241	-0.435733	0.6783
X2(-3)	0.210941	0.121067	1.742343	0.1321
X2(-4)	-0.286099	0.070854	-4.037852	0.0068
X3	-0.006645	0.004634	-1.433988	0.2016
X3(-1)	0.019810	0.005500	3.601816	0.0113
X3(-2)	0.043910	0.004600	9.545597	0.0001
X3(-3)	0.015235	0.003969	3.838985	0.0086
X3(-4)	0.056546	0.006026	9.384265	0.0001
C	-164821.1	19586.98	-8.414827	0.0002
R-squared	0.996191	Mean dependent var		13260.78
Adjusted R-squared	0.985399	S.D. dependent var		8072.730
S.E. of regression	975.4744	Akaike info criterion		16.71743
Sum squared resid	5709302.	Schwarz criterion		17.60097
Log likelihood	-182.6092	Hannan-Quinn criter.		16.95183
F-statistic	92.30614	Durbin-Watson stat		2.212851
Prob (F-statistic)	0.000008			
*Note: p-values and any subsequent tests do not account for model selection. Source: Prepared by the researcher depending on the outputs of the program (Eviews.9).				

existence of a cutter, the existence of a cutter and a general trend at a significant level (5% and 10%) and they settled at the first difference at a significant level (1%), whether in the presence of a categorical and a cutter and a general and without abreaker and a general trend, As for the two variables (investment allocations and agricultural product) they are stable at the first difference at a significant level (1%) whether in the presence of a categorical and a general direction and without a breaker and a general trend.

**• Two: Initial Test of the model (ARDL):**

After ensuring the stability of the time series of variables at the level and at the first difference, we estimate (ARDL) of the study variables.

Table 2, shows the results of the initial test of the model (ARDL) of the study variables which shows that the value of (R<sub>2</sub>) reached (0.99), that is the independent variables illustrate about (99%) of the changes that happen in the dependent variable;

And the remaining (1%) are random errors that the model did not take into consideration. As to the significance of the model as a whole, the statistical value of (F) reached (92.3) and the level of significance was 0.000

which is less than (1%). This means that the model is essential, important and may be reliance on the future, As in the following mathematical equation :

$$Y = -164821.1 + 20.85461X_1 - 0.900916X_2 - 0.006645X_3$$

$$t = (-8.414827) (9.178702) (-5.946126) (-1.433988)$$

$$R^2 = 0.996; \bar{R}^2 = 0.985; F = 92.306; D.W = 2.212$$

**• Three: Testing the Common and Long-Term Integration Relationship by Using Bound Test:**

After testing the (ARDL) sample in the short-term among the study variables, we test the boundaries to discover the common integration relationship among these variables by using (bound test).

Table 3, illustrates the results of (bounds test) to uncover the common integration relationship among the

a<sub>0</sub> = Fixed limit

b<sub>1</sub>, b<sub>2</sub>, b<sub>3</sub> = Form parameters

**• One: Testing the Stability of the Variables:**

1. The Graphic Diagram of Time Series: Before making the series of time submit to any test, it is necessary to represent it graphically by time to know the kind and nature of this series; the graphic curve of the series of time is considered as an initial sign about the possible nature of the series, for instance, if this curve shows a general vector (upwards or downwards) then that would indicate that the time series is unstable and its average varies across time.

2. The expanded test of Diki-Foler (ADF): The results of The table 1, below, it has become clear that the two variables (the reclaimed lands and the gross national product) have become stable at the level, with the

**Table 3:** The results of common integration relationship among study variables.

K (Number of independent variables)	Value	Test Statistic
3	52.66091	F-statistic
I1 Bound	I0 Bound	Significant level
3.77	2.72	10%
4.35	3.23	5%
4.89	3.69	2.5%
5.61	4.29	1%

Source: Prepared by the researcher depending on the outputs of the program (Eviews.9)

study variables. It has been revealed that the statistic value of (F) has reached (52.6) and it is greater than the table value which is (5.61) at the significant level of (1%). This means that there is a strong common integration relationship among the variables of study in the long-term.

**• Four: Estimation of error correction model and short and long term relationship (ARDL):**

After ensuring the existence of a long-term balanced

**Table 4:** The Short and Long-Term Relationship and the Equation of Error Correction among the Study Variables.

ARDL Cointegrating and Long Run Form; Dependent Variable: Y; Selected Model: ARDL (3, 3, 4, 4); Date: 08/01/18 Time: 12:01; Sample: 1990 - 2017; Included observations: 24.				
<b>(Short-term relationship) Cointegrating Form</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	2.933263	0.335197	8.750874	0.0001
D(Y(-2))	1.539537	0.186765	8.243184	0.0002
D(X1)	20.854613	2.272066	9.178702	0.0001
D(X1(-1))	-13.855766	1.690782	-8.194888	0.0002
D(X1(-2))	-7.348850	0.960939	-7.647572	0.0003
D(X2)	-0.900916	0.151513	-5.946126	0.0010
D(X2(-1))	0.062415	0.143241	0.435733	0.6783
D(X2(-2))	-0.210941	0.121067	-1.742343	0.1321
D(X2(-3))	0.286099	0.070854	4.037852	0.0068
D(X3)	-0.006645	0.004634	-1.433988	0.2016
D(X3(-1))	-0.043910	0.004600	-9.545597	0.0001
D(X3(-2))	-0.015235	0.003969	-3.838985	0.0086
D(X3(-3))	-0.056546	0.006026	-9.384265	0.0001
Coint. Eq(-1)	-4.618442	0.449159	-10.282415	0.0000
Cointeq = Y - (10.9757×X1 -0.2279×X2 +0.0279×X3 -35687.5967)				
Correct error equation				
<b>(Long-term relationship) Long Run Coefficients</b>				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1	10.975656	0.222253	49.383535	0.0000
X2	-0.227855	0.004630	-49.217800	0.0000
X3	0.027900	0.001365	20.443710	0.0000
C	-35687.527	1042.057123	-34.247256	0.0000

Source: Prepared by the researcher depending on the outputs of the program (Eviews.9).

relationship (common integration relationship) among the variables of the study, the next step follows to determine the long and short-term relationship among these variables and that is done by estimating the sample of error correction and which is an important one in the tests (ARDL) and in this test the error correction parameter (Coint Eq(-1)) is depended on to show the correction of the relationship between the short-term and the long-term; if the error correction parameter (CointEq(-1)) is negative and significant then this would implicitly indicate that there is a common integration relationship among the variables that is the deviations in the short-term correct the direction or the deviations of the long-term balance value during the same year or the same semester.

The above table illustrates the results of the short and long-term relationship and the error correction equation, as for the short-term relationship it has become clear that the independent variable ( $X_1$  the agricultural product) is connected by significant and ejective relationship with the dependent variable (Y the investment allocations), that is the increasing the independent variable ( $X_1$ ) by one unit leads to increasing the dependent variable (Y) by (20.85) unit in the short-term; as for the relationship between the independent variable ( $X_2$  the gross national product) and the dependent variable (y investment allocations), it is reversive and significant, that is increasing the independent variable ( $X_2$ ) by one unit would lead to a decrease in the dependent variable (Y) by (-0.90), As for the relationship between the independent variable ( $X_3$ ) the reclaimed lands and the dependent variable (Y investment allocations) it is reversive and not significant that is increasing the independent variable by one unit would lead to decreasing the dependent variable (Y) by (-0.00664) and after a year it would be significant, that is increasing the independent variable by one unit would lead to decreasing the dependent variable by (-0.043), as for the equation of error correction (CointEq(-1)) it is negative and significant that is has met the sufficient and necessary condition. This means that there is a long-term balance relationship among the study variables. As shown in the following short-term equation :

**Table 5:** Results of Autocorrelation and Heteroscedasticity test of the Relationship among Study Variables.

Breusch-Godfrey Serial Correlation LM Test			
0.8833	Prop . F	0.128021	F- statistic
0.4858	Prob. Chi-Square	1.443835	Obs*R-squared
Heteroscedasticity Test: Breusch-Pagan-Godfrey			
0.9883	Prob. F	0.252695	F-statistic
0.9030	Prob. Chi-Square	10.01373	Obs*R-squared
Source: Prepared by the researcher depending on the outputs of the program(Eviews.9)			

$$Y = -4.618442 + 20.85461X_1 - 0.900916X_2 - 0.006645X_3$$

$$t = (-10.282415) (9.178702) (-5.946126) (-1.433988)$$

As for the long-term relationship, the independent variable ( $X_1$  the agricultural product) is directly connected with the dependent variable ( $Y$  investment allocations), that is increasing the independent variable by one unit would lead to an increase in the dependent variable by (10.9) due to the role of agriculture policy in applying the concepts of production economics and using economic resources in a scientific way so that checks together with them, to maximize the volume of agricultural product, Whereas, the relationship between ( $X_2$  the gross national product) and ( $Y$  investment allocations), it is inverse and significant in the long-term, this means that increasing the independent variable ( $X_2$ ) by one unit would decrease the dependent variable ( $Y$ ) by (-0.22). This reflects a decrease in investment allocations is due to the inability to spend the determined allocations in the plans and the low efficiency of the executive bodies and the limited absorption capacity of this sector, as for the relationship

between the independent variable ( $X_3$  reclaimed lands) and the dependent variable ( $Y$  investment allocations), it is direct and significant it means increasing the independent variable by one unit would increase the dependent variable by (0.02), the more the investment allocations for reclamation of agricultural lands the more increases the reclaimed lands. As described in the following long-term equation:

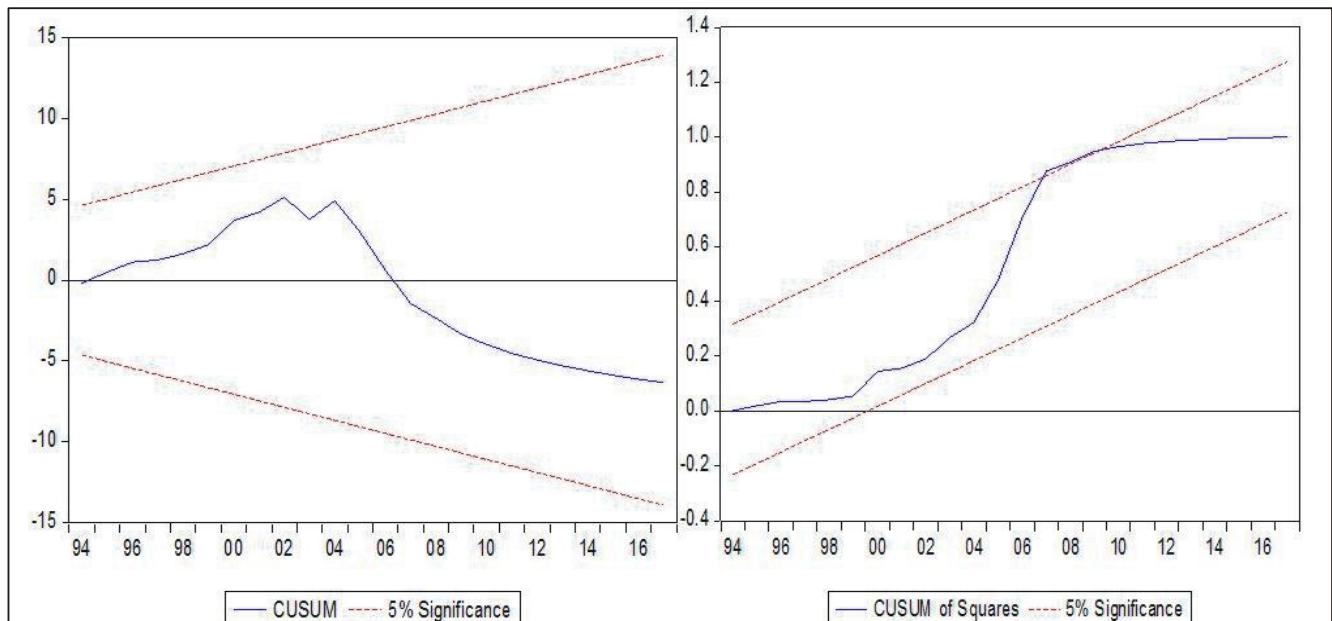
$$Y = -35687.527 + 10.975656X_1 - 0.227855X_2 + 0.027900X_3$$

$$t = (-34.2472) (49.383535) (-49.217800) (20.443710)$$

**• Five: Testing Autocorrelation and the Heteroscedasticity in the ARDL model:**

The estimated models are secured that they have no problem of Autocorrelation by using the test (Breusch-Godfrey Serial Correlation LM Test) and also using the test (Heteroscedasticity Test: Breusch-Pagan-Godfrey) to ensure that the estimated models have no Heteroscedasticity problem at the significance level (5%) for the relationship among the variables of the study.

From table 5, it is noticed that the estimated models (ARDL) for the relationship between study variables is free from the problem of Autocorrelation according to the test (Breusch-Godfrey Serial Correlation LM test). That is we accept the null hypothesis of which holds that there is no Autocorrelation problem, this is so because the value of (Prop.F) and (Prob. Chi-Square) is not significance at the level of significance (5%) for all the models and the alternative hypothesis is rejected, also the estimated models of (ARDL) have no problems of Heteroscedasticity and the values of (Prop.F) and (Prob.



**Fig. 2:** Results of Stability Test for the Estimated model among the Study Variables.

Source: Prepared by the researcher depending on the outputs of the program (Eviews.9).

Chi-Square) were not significant at the level of significance (5%) according to the test of (Heteroscedasticity Test: Breusch-Pagan-Godfrey).

• **Six: Testing the Stability of the Estimated models by Using the Test (CUSUM, CUSUM Squares):**

The test of stability of the (ARDL) estimated model is an important tests to ensure that the data used in the study is free of any skeleton changes in it and that is conducted by using the cumulative total residual test (CUSUM) and also the cumulative sum of the residual squares (CUSUM sum of Squares). These two tests are one of the most important tests in this field for they illustrate two important issues: to see whether there is any skeletal change in the data and the stability and harmony of long-terms Parameters with the short-term ones. Such tests always be accompanied methodology (ARDL). If the graph diagram of both tests (CUSUM/ CUSUM SQ) was inside the critical boundaries at the level of significance (5%), this would mean that all estimated Parameters are stable and there are no skeletal changes and *vice versa*. As shown in the fig. 2.

From fig. 2 and from part (CUSUM), we notice that the accumulated sum of residuals inside the boundaries of the critical values at the level of significance is (5%) and this shows the stability of estimated coefficient in the short-term. The part (CUSUM of Squares) illustrates the accumulated sum of the squares residuals was within the boundaries of the critical values at the level of significance is (5%). Illustrated from the two tests, CUSUM of Squares and CUSUM, it has been seen that there is a kind of stability and harmony in the model between the long-term and short-term results.

### Conclusions

1. The variable of the agricultural product was positive and signification in the two terms that is, by increasing the agricultural product by (1%); by this the investment allocations increase by (20.85) in the short-term and in the long-term increases by (10.9) and this corresponds to the logic of economic theory and it returns the role of the agricultural policy in applying the concepts of production economies and guided use of agricultural economic resources and using them in a scientific way so as to maximize the volume of agricultural product.

2. The value of the gross national product, it has shown a significant negative effect in the two terms contrary to economic logic, that is by increasing the gross national product by (1%) and the investment allocations fall by (-0.90) in the short-term, as for the long-term they

fall by (-0.22). This reflects the decrease in investment allocations due to the inability to disburse the allocated allocations in the plans, the low efficiency of the executive bodies and the limited capacity of this sector.

3. The reclaimed area variable in the short-term showed a negative and non-significant effect but became significant a year later; the investment allocations have fallen by (-0.043) in the short-term, as for the long-term period, it also has a positive and significant impact compatible for the economic logic. The more investment allocations to reclaim agricultural land, increase reclaimed areas.

4. It has been shown, through the results, that the equation of error correction is negative and significant, that is, it has achieved the sufficient and necessary condition in other words, there is a long-term equilibrium relationship between the study variables.

5. The results of the analysis showed that all-time series values of the variables are unstable by the Extended Dicky Fuller test. The values of the first difference should be used in order to stabilize them before starting the analysis. It was found that there is a strong co-integration relationship between the variables of the study in the long term and this confirms the validity of the selection of independent variables that affect investment allocations.

### Recommendations

1. An expansion should be done in using the up-to-date technological styles represented in the usage of modern production requirements such as using modern irrigation systems besides expanding the use of mechanization, fertilizers, insecticides and agricultural kinds of the high ranks that have a big role in raising the rates of the production of agricultural crops.

2. Reclaiming agricultural lands and desalinating them and providing irrigation nets and water drainage systems for these measures have a considerable role in increasing the arable lands and consequently increasing product.

3. Study the technical economic feasibility before starting to invest and cultivate salt-resistant varieties for the purpose of reclamation because some crops resist the proportion of salts in the soil and suitable for cultivation in those soils.

4. Increase investment in agricultural reclamation by increasing investment allocations to the public sector in the agricultural sector and employ them in projects that serve the improvement of agricultural land such as land reclamation and the extension of rural roads and rural electricity and other projects that serve the agricultural sector.



5. The use of organic materials that improve the physical and chemical properties of soils, laboratory and chemical analysis of the use of soil conditioners and their evaluation.

6. Knowledge of soil classification and land assessment before starting agricultural investment and the use of suitable irrigation water that is low in salt content.

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