

The Impact of Public Spending on Economic Growth  
in Algeria: A Standard Study for the Period  
1988-2016

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## The impact of public spending on economic growth in Algeria- A standard study for the period (1988-2016)

أثر الإنفاق العام على النمو الاقتصادي في الجزائر - دراسة قياسية للفترة

(2016-1988)

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### Abstract:

This study aims to determine the direction and the relationship between the public spending and the economic growth in Algeria from 1988 till 2016, by way of applying the autocorrelation method. The study result shows that there is one way causal relationship starting from the internal output to public spending than management expenses and the effect on each of the .also the result shows that there is a common integration for the long term between independent variables and the GDP

**Key Words:** Public Spending, Cointegration, Economic Growth, Spending management, equipment Expenditures.

**JEL Classification:** I21, G24, C13.

### ملخص:

تهدف هذه الدراسة إلى تحديد اتجاه وطبيعة العلاقة بين الإنفاق العام والنمو الاقتصادي في الجزائر خلال الفترة (1988-2016)، من خلال تطبيق منهجية الارتباط الذاتي. حيث بينت نتائج الدراسة على وجود علاقة سلبية أحادية الاتجاه من الناتج الداخلي إلى الإنفاق العام ونفقات التسيير ونفقات التجهيز والتأثير على كل منها، كما بينت النتائج أن هناك تكامل مشترك على المدى الطويل بين المتغيرات المستقلة والناتج الداخلي

**الكلمات المفتاحية:** الإنفاق العام، التكامل المشترك، النمو الاقتصادي، نفقات التجهيز، نفقات التسيير.

**تصنيف JEL:** I21, G24, C13

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## **1. Introduction :**

The economic oil crisis in 1986, which demonstrated the fragility of the Algerian economy, made this recent change of its economic policy, after the huge losses incurred and the low living standards of the citizens because of the dependence of its economy of fuel by about 97% . This led to the adoption of new development programs in various economic sectors, which was intended to revive the national economy and improve the rates of economic growth, which is the so-called policy expansionary spending power embodied by three development programs and of supporting economic recovery program (2001- 2004) and the supplementary program to support economic growth (2005- 2009) and in the last Five-Year development program (2010-2014).

The government spending prominent role in achieving development goals, which represents a form of state intervention in economic activity so that the financial policy plays a major role in achieving stability and balance in the absence of a strong monetary policy, this was the duty of the state to play an important role in guiding economic activity towards the desired direction and planned through the infusion of funds in the economic cycle, public investments to achieve the objectives of its ruler, is the most important means of public expenditure which depend on the state to improve all economic and social aspects.

The study focuses on the problem of knowing whether there are expenses for processing, management and other public expenditure impact on economic growth in Algeria, where the latter was represented in the domestic product, the study relied on the period from 1988 to 2016.

This study was based on the following assumptions:

- There is cointegration between public expenditure and economic growth in Algeria relationship.
- The processing expenses and investment have a positive impact on domestic output.

- High volume of public expenditures positively affect the internal output.
- There is a one-way relationship from economic growth to public expenditure.

The objective of this study is to analyze the impact of spending Economic growth in Algeria, as well as to know whether the management and processing expenses of the expenses of support, especially in this period experienced by Algeria's economic growth and to emphasize the importance of the role played by the State in improving economic activity and to show the relationship between the public expenditure in general economic growth.

The importance of this study is the fact that Algeria, like other countries need to achieve economic growth to reduce its dependence on the main sector for economic growth, which fuels and the oil sector, adding to the fundamental role of fiscal policy in the lifting of the economic growth and the increase in public expenditure.

#### **Previous and literatures studies:**

Among the most important studies that have attempted to clarify the relationship between public expenditure and economic growth in recent years are:

- a study jaouad OBAD et Youssef JAMAL (2016): Which was entitled

#### **L'impact des dépenses publiques sur la croissance économique au Maroc: Application de l'approche ARDL**

Researchers tried through this study, knowledge of the relationship between public spending and economic growth by applying the estimation method ARDL In the State of Morocco during the period between 1980 to 2014.

Where the results of this study showed that there is a negative impact on public expenditure on economic growth in the long term and in the short term, and these results have been interpreted by scholar

non-productive nature of public spending and increasing debt burden and a sharp decline in investment spending the Which was not in favor of economic growth, and also interpreted this result to flow overhead on private investment and private spending is hindering economic growth in the long term. (Obad Jaouad, 2016)

- Study of Laura Varela – Candamio, Gohar Samvel Sedrakyan year 2017: which was titled:

### **The Impact of Public Expenditures on Economic Growth in Two Very Different Countries : A comparative Analysis of Armenia and Spain.**

VAR For the analysis of annual data for years (1996- 2014), this study indicate that there is some relationship between public expenditure and economic growth in both countries, and confirm causality tests results for Granger Also that public expenditure (defense, health care, education) have a strong impact on economic growth in Armenia on the one hand, and on the other hand, health care and at the expense of economic affairs affecting economic growth in Spain, in addition, the real GDP has an impact strong on all public expenditures in Armenia and on public services, health care and social protection in Spain. Analysis shows that these expenditures can promote economic growth and economic growth enhances these expenditures in return. (Varela Laura, 2017)

- Ben Azza Hana Study (2017):Entitled "The impact of government spending on economic growth in Algeria (1990/2014)"

This study aimed to explore **the impact of government spending (consumption and investment) on economic growth in Algeria during the period 1990-2014**, where the study found that consumer government spending has a negative impact and significant economic growth only in the short term, to become this insignificant impact in the medium and long term, but with regard to the impact of government

investment spending on GDP has been shown to have a positive and significant effect on economic growth only in the short term, this is becoming a significant impact in the medium and long term. (هنا، 2017)

## **2. The concept of public expenditure and its pillars:**

Known as alimony as "the amount of money is to be spent in a person with a view to satisfying the general arguments". (القيسي، 2017، ص36)

We conclude from this definition that there are elements of the public's expense are (ابراهيم، 2011، ص107)

### **Amount of cash and not in kind:**

In modern times, public expenditure has become the only form of cash and in-kind system which was used in ancient times ended.

- The issuance of this public institution affiliated to the government:**

Even considered public alimony must be issued by a company or person in general are not considered alimony if issued from a private party even if the objective of public interest.

- Gratification General need:**

From here we note that there is a close relationship between public spending and public needs such as security and protection ... so you must distinguish between special needs and general needs.

### **2.2 Operating expenses and expenses of processing:**

Based on the organizational law of financial laws, the appropriations under the financial law, including management expenses and investment expenses(دادن، 2002، ص21) . For the expenses of management (current), Those expenses allocated to the normal and natural state of activity, which will allow the conduct of the state's activities and decent application of ongoing missions. Which are the ones that pay for public and administrative interests, (درواسي، 2005، ص5)

As it branched into four chapters, namely: the burden of public debt and expenses deducted from revenues, allocations of public authorities,

which is necessary for the functioning of the political institutions of state expenditure, as well as necessary for the functioning of the various departments of public expenditure and finally state interventions in various areas of economic and social.(دادن، 2002، ص24)

- The processing expenses represent those expenses that have investment, which is generated when the increase in the gross national product character (PNB) Thus increasing the country's wealth. The processing is called the name of the budget processing or investment budget expenditures and these expenditures from the social and administrative structural economic investments, They are divided into three sections: the investments carried out by the State, investment subsidies granted by the State and other capital expenditures.

### **2.3 Economic growth:**

Economic growth is the quantitative increase economic indicator is often gross domestic product(PIB) Or national GDP (PNB) Whether total or per capita, and hence economic growth represents the amount of the phenomenon is measured by average (Hamidi ,2009 ,p36 )

It can be said that economic growth is the increase in the wealth produced by a State or group of States within a certain period of time. (Jiménez, 1992, p 43)

Economic growth is also considered a means of development for the elimination of poverty and unemployment.

### **3. Methods and Materials:**

Cointegration If an OLS regression is estimated with non-stationary data and residuals, then the regression is spurious. To overcome this problem the data has to be tested for a unit root (i.e. whether it is stationary). If both sets of data are I(1) (non-stationary), then if the regression produces an I(0) error term, the equation is said to be cointegrated.

The most basic non-stationary time series is the random walk, the Dickey-Fuller test essentially involves testing for the presence of a random walk..

$$y_t = y_{t-1} + u_t \dots \quad (1)$$

Although this has a constant mean, the variance is non-constant and so the series is non-stationary. If a constant is added, it is termed a random walk with drift. To produce a stationary time series, the random walk needs to be first-differenced:

$$\Delta y_t = u_t \dots \quad (2)$$

### 3.1 Augmented Dickey-Fuller (ADF) Test

The Dickey-Fuller test is used to determine if a variable is stationary. To overcome the problem of autocorrelation in the basic DF test, the test can be augmented by adding various lagged dependent variables. This would produce the following test:

$$\Delta y_t = (\rho - 1)y_{t-1} + \alpha_i \sum_{i=1}^m \Delta y_{t-i} + u_t \dots \quad (3)$$

The correct value for  $m$  (number of lags) can be determined by reference to a commonly produced information criteria such as the Akaike criteria or Schwarz-Bayesian criteria. The aim being to maximize the amount of information. As with the DF test, the ADF test can also include a drift (constant) and time trend.

Common criticisms of these tests include a sensitivity to the way the test is conducted (size of test), such that the wrong version of the ADF test is used. The power of the test may depend on:

- The span of the data, rather than the sample size. (This is particularly important for Financial data)
- If  $\rho$  is almost equal to 1, but not exactly, the test may give the wrong result.
- These tests assume a single unit root I(1), but there may be more than one present I(2).
- If the time series contains a structural break, the test may produce the wrong result.

### 3.2 Engle-Granger test for Cointegration

To test for cointegration between two or more non-stationary time series, it simply requires running an OLS regression, saving the residuals and then running the ADF test on the residual to determine if it is stationary. The time series are said to be cointegrated if the residual is itself stationary. In effect the non-stationary I(1) series have cancelled each other out to produce a stationary I(0) residual.

$$y_t = \beta_0 + \beta_1 x_t + u_t \quad \dots \quad (4)$$

Where  $y$  and  $x$  are non-stationary series. To determine if they are cointegrated, a secondary regression is estimated:

$$\Delta u_t = -0.56 u_{t-1} \quad \dots \quad (5)$$

(0.10)

This produces a t-statistic of  $-5.60$ . If the critical value for this model is  $-2.95$  (for example), we would reject the null hypothesis of non-stationary time series and conclude the error term was stationary and the two variables are cointegrated.

### 3.3 The Granger Representation Theorem

According to this theorem, if two variables  $y$  and  $x$  are cointegrated, then the relationship between the two can be expressed as an error correction model (ECM), in which the error term from the OLS regression, lagged once, acts as the error correction term. In this case the cointegration provides evidence of a long-run relationship between the variables, whilst the ECM provides evidence of the short-run relationship. A basic error correction model would appear as follows:

$$\Delta y_t = \chi_0 + \chi_1 \Delta x_t - \tau(u_{t-1}) + \varepsilon_t \dots\dots\dots (6)$$

Where  $\tau$  is the error correction term coefficient, which theory suggests should be negative and whose value measures the speed of adjustment back to equilibrium following an exogenous shock. The error correction term  $u_{t-1}$ , which can be written as:  $(y_{t-1} - x_{t-1})$ , is the residual from the cointegrating relationship in (4)

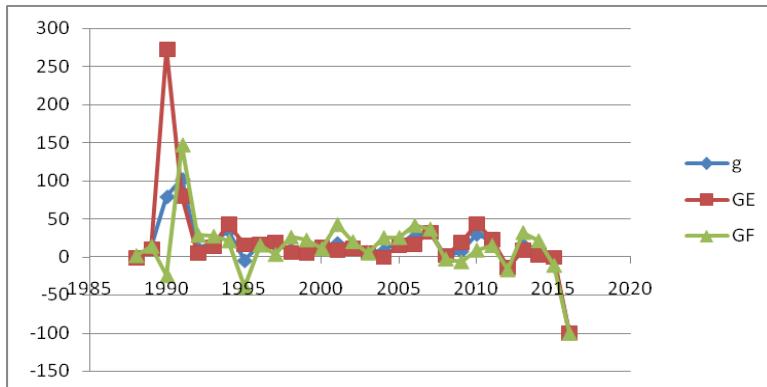
## 4. Results and discussion :

### **First: An analytical study of the evolution of the study variables in Algeria**

#### **4.1 The study of the evolution of public expenditure in Algeria:**

After that Algeria has adopted a policy expansionary spending power, public spending rates known as a dramatic rise, especially in the period that saw the rise in oil prices, which is the only source dependent upon the state.

**Figure (01) represents the evolution of public expenditure in Algeria**

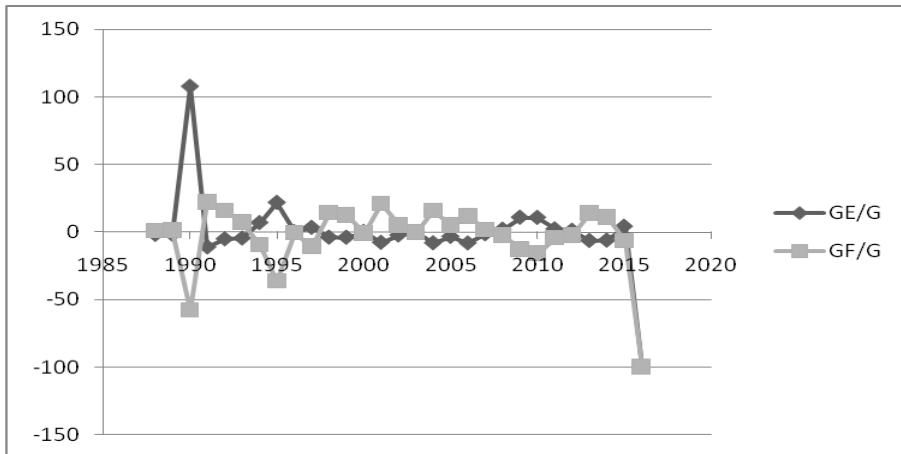


**Source:** prepared by researchers.

From the previous figure clearly note the continuing rise of various public expenditure, as this is due to the structural reforms that were between 1986 and 1998 that saw the period between 1988 until 1990 increase in operating expenses was estimated at 270 as the highest rise seen among other expenses, while the end of the nineties the beginning of the growing volume of overhead and expenses management and expenses of processing are closely and modest somewhat thanks to improved financial situation of Algeria thanks to high oil prices, which was launched to support the economic recovery plan (2001-2004), and after the adoption of the state large expansionary policy touched all sectors occurred in the spending of For the year reached its peak in 2009 to witness volatility and convergence among them to a sharp decline from 2013 to 2016 due to the decline in oil prices again.

#### 4.2 The study of the evolution of operating expenses and equipment for public expenditure:

Figure (02) represents the evolution of management and processing expenses for public expenditure:

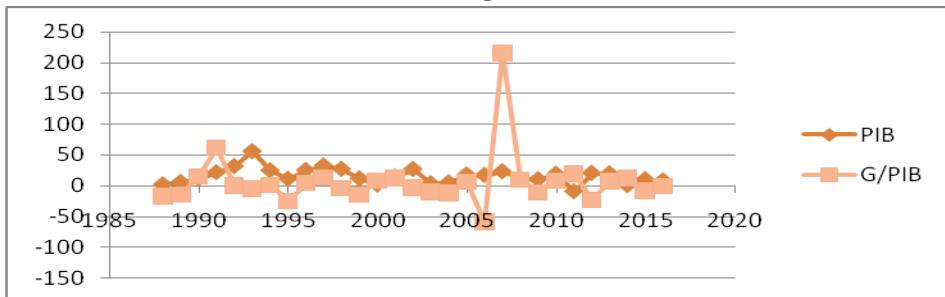


Source: prepared by researchers.

Through what is observed at the beginning of the previous figure there is a contradiction so that represented the management largest percentage of the total public expenditure expenses in 1990 was offset by the lowest value in that year for the expenses of the processing of the total public expenditure in the rest of the years have seen fluctuations in the volume of both the management and the expenses of expenses any processing between high and low somewhat modest, in line with the economic policy adopted by Algeria. While processing expenses have declined sharply since the year 2015.

#### 4. 3 The study of the evolution of public expenditure for economic growth:

**Figure (03) represents the evolution of public expenditure for economic growth.**



**Source: prepared by researchers.**

Under the policy and spending power expansion of new development programs pursued by Algeria, which was aimed at improving economic growth rates that were three development programs in the form of:

- Support the economic recovery program for the period 2001-2004, which has been allocated a financial envelope is estimated at \$ 525 billion.
- Supplementary program to support economic growth for 2005-2009 was allocated a financial envelope is estimated at \$ 140 billion.
- The third and last program which is the five-year development program 2010-2014 with a budget of \$ 286 billion.

From the previous figure we note that the increase in the size of both public expenditure and economic growth was modest and convergent, where public expenditures for domestic output peaked in 1991 and the domestic product in 1993, returning to rise medium pace during the period between 1995 and 2005 for the general expenses of the highest her height in the study period

in 2007, and return the rest of the medium pace of the study period. As for the internal output Fassar medium pace the length of the study period.

### **Second: standard study**

Before carrying out assessment of the model under study must study the stability of the time series of variables that have been adopted since it is the following variables:

G Represents public expenditure

GE : Represents operating expenses

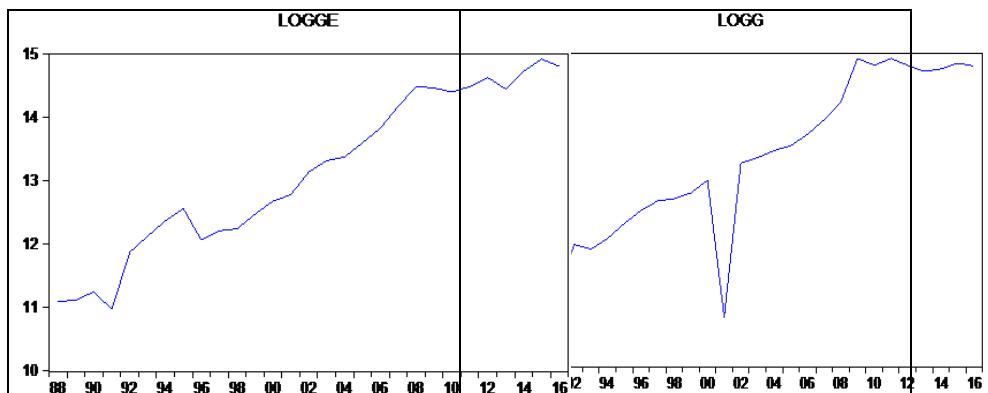
GF : Represent processing expenses

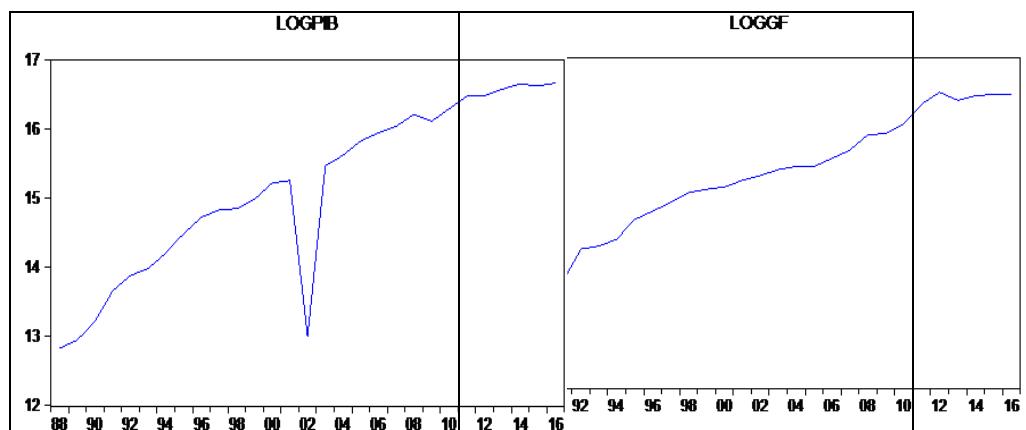
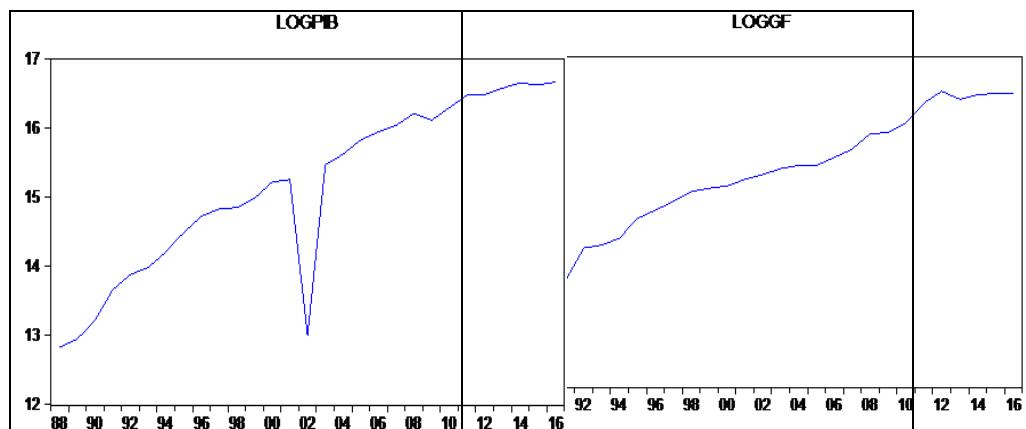
PIB : Gross domestic product

#### **1. Study time series Stability :**

To find out whether the time series is stable or not, we will adopt in our study graphic representation of the time series variables study Ballegareetm ( (Log G, log GE, log GF, log PIB, Which represents pro-forms:

**Figure (04): a graphic representation of the logarithm of the study variables**





**Source:** prepared by researchers on the adoption of outputsEviews08

- Through the graphic representation of the various time series variables logarithm note that all time series are not stable at the level.
- After using the unit root test shows that all the time series of different variables have the same degree of differences which is given in the pro table:

**Table (01): shows the unit root test results**

Log PIB	Log GF	Log GE	Log G	Variables
I (1)	I (1)	I (1)	I (1)	The degree of differences

**Source: prepared by researchers.**

So: Since all time series variables under study have stabilized at the same level, it is possible for a common integration of relations between them, and to detect that we use test Johansson By testing the “impact” test “Great self-value”, but before that it must determine the appropriate period of delay for it.

**2. Determine periods of delay:** To determine the appropriate periods of delay in this study, we will rely on the standard AIC And Schwarz Which was explained in the pro table:

**Table (02): shows the degree of delay**

Sample: 1988						
2016						
<b>Included observations: 26</b>						
Lag	LogL	LR	FPE	AIC	SC	HQ
<b>0</b>	-76.36299	NA	0.005687	6.181768	6.375321	6.237504
<b>1</b>	5.250223	131.8367	3.73e-05	1.134598	2.102365	1.413280
<b>2</b>	24.27992	24.88498	3.26e-05	0.901545	2.643525	1.403172
<b>3</b>	58.62005	34.34013	1.05e-05 *	-0.509234	2.006959	0.215338
	*		*	*	*	*

**Source: prepared by researchers on the adoption of outputsEviews08**

Through the table above it is clear that the appropriate delay period according to a standard AIC And Schwarz she ( $P = 3$ )

**3. Cointegration test :**

After some delay periods and select three periods we will try to akhtbarahatmal a joint integration relationship study variables in the long run, as test “Johansson”, which explains the next table:

**Table (3): Johansson test results**

Unrestricted Cointegration Rank Test (Trace)				
Hypothesized	Trace	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
<b>None *</b>	0.850504	93.37491	47.85613	0.0000
<b>At most 1 *</b>	0.705071	45.86275	29.79707	0.0003
<b>At most 2</b>	0.426183	15.33727	15.49471	0.0528
<b>At most 3</b>	0.056394	1.451152	3.841466	0.2283

**Trace test indicates 2 cointegrating eqn(s) at the 0.05 level**

\* denotes rejection of the hypothesis at the 0.05 level

\*\*MacKinnon-Haug-Michelis (1999) p-values

Unrestricted Cointegration Rank Test (Maximum Eigenvalue)				
Hypothesized	Max-Eigen	0.05		
No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
<b>None *</b>	0.850504	47.51217	27.58434	0.0000
<b>At most 1 *</b>	0.705071	30.52548	21.13162	0.0018
<b>At most 2</b>	0.426183	13.88611	14.26460	0.0573
<b>At most 3</b>	0.056394	1.451152	3.841466	0.2283

**Max-eigenvalue test indicates 2 cointegrating eqn (s) at the 0.05 level**

\* Denotes rejection of the hypothesis at the 0.05 level

\*\* MacKinnon-Haug-Michelis (1999) p-values

**Source: prepared by researchers on the adoption of outputsEviews08**

- Through the previous table, we note the existence of a common integration relationship between the studied variables Ballegareetm (LogG, log GE, log GF, log PIB), And which we estimated error correction model on the final stage Vthsalna the following equation.
- D (LOGPIB) = -0.025630) \* (LOGPIB (-1) – 1.47623069679 \* LOGG (-1) + 14.5655033077 \* LOGGE (-1) -18.4016860095 \* LOGGF (-1) + 68.9396258235) + 0.001586) \* D (LOGPIB (-1)) + -0.034269) \* D (LOGPIB (-2)) + 0.048637)) \* D (LOGPIB (-3)) + 0.996423D (LOGG (-1)) 0.051272) \* D (LOGG (-2) ) + 0.096414D (LOGG (-3)) + 0.146632D (LOGGE (-1)) + 0.296335) \* D (LOGGE (-2)) + 0.099505D (LOGGE (-3)) + 0.082589) \* D (LOGGF (-1)) + 0.330285D (LOGGF (-2)) + 0.378346D (LOGGF (-3)) + -0.167622

Through this equation, it is clear that the greater public expenditure by one unit when the delay period of one will increase gross domestic product by 1.47 As for the expenses of processing it is the higher one unit will increase output by 14.56 when late one period, while operating expenses, they lower the b 18:40 will decrease gross domestic crude by 0.03.

### **5. Causality test:**

that Values end The first error vector common integration was negative and spirits and this indicates the existence of a joint integration of long-term relationship Which means that he There is the influence of the independent variables in the variable in the long term, either with regard to the impact of independent variables in the variable in the short term we note that the parameters were positive and insignificant And With regard to the coefficient of determination BOnce there are more than two variables, it is better Use The debugger selection as the value of this parameter coefficient 91% where this ratio shows that the change in the dependent variable, see Log PIB to change in these independent variables As for winning 9% of the change in the dependent variable due to other factors. The F value of the calculated estimated at 18.68 is greater than the scheduled and this indicates the acceptance of a statistical model.

- The results of this test shows that there is a causal relationship between the direction of one-two variables Log GE and G log that is affecting the Log GE is log G. is confirmed by the calculated value of F are greater than the value of F scheduled and this is what supports the value of the probability is less than 5%.
- As well as the results show that there is a causal relationship between the two variables one-way and log G Log GF ie G log affects in which Log GF shown in the value of F are greater than the calculated value of F scheduled at the level of 5% probability value is less than 5%.
- There is a causal relationship between the two variables And Log G log PIB that there is no unilateral effect of the direction of the log G log PIB This is illustrated by the calculated value

of F is greater than the value of F desorption Dr Ululation And the probability value is less than 5%

- The proportion of the two variables log GE And log PIB There is a causal relationship in direction One that is log GE affects a log PIB F value is greater than the calculated value of F scheduled at the level of 5%.

## **6. Conclusion:**

- Public expenditure represents a basic tool that is used in public finance and fiscal policy framework in order to achieve their objectives, and depending on the nature of the economic and social system, and the degree of development of the economy and its circumstances, resources, and needs, and return the importance of public expenditures as the means used by the state to achieve the role played by in various fields, ie public expenditure activity draws the limits of the state of economic and social, so they can accommodate when increasing the state's role in economic activity and narrowing when it is limited to this role.
- So we tried through this study knowledge of the impact of management and processing expenses and overhead expenses on economic growth in a The Algeria, during the period of 1988- 2016 Where he reached the Results to me A stable relationship between the variables for long (joint integration) Which It allows to know the direction of causality and analysis Response Random variables to shocks and give unwinding variance prediction error for each variable, This study also demonstrated On Validity of the model as well as the existence of a causal relationship towards one of The Output Internal The Ore to all of the expenses The And the conduct of The expenses of the Processing as well as the presence of direction One for each of The Output Raw internal to me The Expenses The General.

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