An econometric study of the impact of financial policy on economic growth in Algeria, 1990-2021

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Abstract:

    This study focuses on the possibility of applying an econometric model of the economic relationship between financial policy tools and economic growth over the period 1990-2021 in order to explain the economic relationship between the variables of financial policy instruments and domestic production using Granger's causality and the VAR self-regulatory vector model. The study found a positive impact of public spending and public revenues on long-term economic growth in Algeria.

Keywords: public spending or,dinary tax revenue; economic growth, financial policy, VAR

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I- Introduction:

Economic growth can be defined as the expansion of real output or the expansion of per capita real national product, and thus relieves the burden of scarcity of resources.[1] It is required by economists that this increase is greater than population growth[2] In addition, the economy of any country is exposed to the waves of the economic cycle (recession / recovery), which contributes to the impact on economic growth rates from one wave to another and from one economic cycle to another.[3] Financial policy is known idiomatically:Fisc" stands for money box or safe[4] The old idea of financial policy has changed radically, as classical economists used to look at financial policy in a neutral way that has no effect on the economic activity of the state, until the idea of functional public finance appeared.[5] It is the policy of using public financial tools such as spending programs and public will to move quantitative economic variables such as national product, employment, savings, and investment, in order to achieve desired effects and avoid undesirable effects on each of the national income and output, the level of employment, and other economic variables.

Financial policy is also defined as that policy according to which the government uses its programs of expenditures and revenues to create desirable effects and avoid undesirable effects on income, production and employment, and in short, the use of financial policy tools such as taxes, expenditures and the general budget in development and economic stability.[6]

There are many and increasing studies on the relationship between fiscal policy and economic growth. Through government spending and taxes, fiscal policy can have lasting effects on economic growth over the long term average and the long one[7] through several major channels. However, the appropriate policy mix will depend on the circumstances, capabilities and preferences of each country (IMF)

International Monetary Fund (IMF) (2015b). Financing for development: Revisiting the Monterrey consensus. World Economic Outlook. Washington D.C.

1. The theoretical framework of the study. (Times New Roman, size 12)

I.1-Research problem

Fiscal policy plays a key role in influencing the performance of economic growth through its tools, public spending, tax collection, or the general budget, positively or negatively affecting the achieved growth rates, and to know the reality and performance of fiscal policy in Algeria in the period between1990-2021 We pose the following problem:

What is the impact of financial policy on economic growth in Algeria during the period between1990-2021?

In order to address this problem, some sub-questions can be asked, as follows:

−What is the reality of the financial policy tools in Algeria during the study period?

−What is the impact of financial policy tools on economic growth in Algeria during the study period?

−Is there a statistically significant relationship between the tools of financial policy and economic growth in Algeria during the study period?

I.2- research hypothesis :

The study hypothesis can be formulated as follows:

Financial policy tools affect economic growth in Algeria in the long term.

I.3.- research aims :

The study is an important topic, which constitutes one of the most important issues that developed or developing countries seek to achieve, which is recording high growth rates using financial policy tools by estimating an econometric model that reflects the relationship between the study variables, deducing results, and coming up with recommendations to be added to previous studies related to the subject of our research. And highlighting the directions of financial policy in Algeria based on the development programs and plans that it launched.

I.4.- research importance :

The importance of this study appears through the role played by fiscal policy in influencing economic growth, especially with the developments witnessed by the growth theory. The study is of particular importance in Algeria, as it came to show the extent of the effectiveness of the expansionary financial policy pursued in promoting the economic growth of the country and providing a scientific reference that represents an additional building block in the field of scientific research to be added to the efforts of those who preceded us in research in this economic field, and the importance of research increases, especially for what the world knew in this period because of the pandemic (COVID 19) which caused the economic recession for developed countries, while Algeria was affected by a significant decrease in its income due to the collapse of oil prices, thus obstructing development programs.

I.5.Study methodology:

In order to enrich this study, we will resort to use the standard approach in order to identify the variables that contribute to determine the economic growth and influence it through a time series extending from 1990 to 2021 and based on the approach of self-ray regression models that allow the analysis of financial policy, and the database of the study variables was obtained from the website of the National office of Statistics (ons), the World Bank, the reports and publications of the Algerian Ministry of Finance.

In this study, we used Eviews 10 as a tool to show the impact of financial policy on economic growth in Algeria, which helped us in identifying the model to be used (autoregressive distributed time gaps RDL)) by employing a set of variables as follows:

1.6. Definition of study variables.

Independent variables:

PE overhead

G:Government spending

R:Revenues

Dependent variable:

PIB:gross domestic product

Study form:

The researchers Pesaran and Al (2001), Shinand and Sun (1998) combined Autoregressive Models and Distributed Lag Models.[8]. Where it can be applied ARDL regardless of the

properties of the time series whether they are stable at I(0) levels *for* integrated first orderI(1) or a mixture of the two but time series must not be quadratic integral $I(2)^9$, can be applied ARDL in the case of a small sample size, unlike most traditional cointegration tests that require a large sample size for the results to be more efficient. The equation for the base model is as follows:

$$PIB_t = \alpha 0 + \alpha 1\, R_t + \alpha 2\, G_t + \alpha 3\, PE_t + \text{\pounds}_t$$

2. The experimental framework for the study.
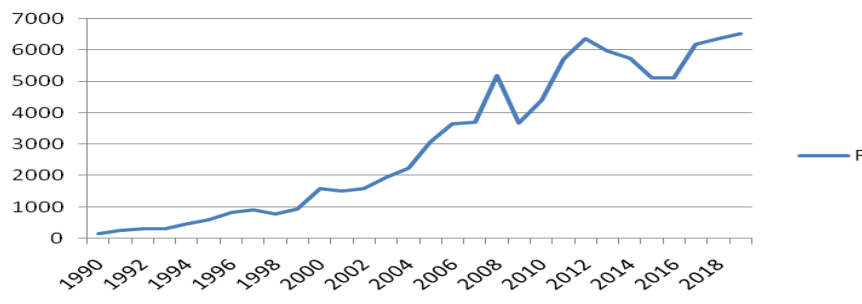
Results and discussion :

Figure (01): the evolution of public revenues in the period from 1990 to 2021
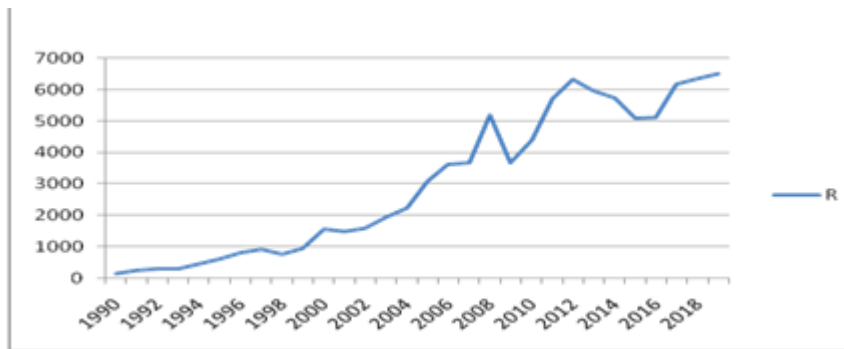
Source: Prepared by the researcher based on the outputs of Excel

The data indicates that Algeria's public revenues for the period from1990 to 2021 witnessed an increase, and this is due to the increase in oil revenues, which represent the most important source of Algeria's budget, as well as the increase in government investment income, which led to an improvement in the financial situation and an increase in the state's oil reserves. It is noted that there is a decrease in the value of revenues due to the crisis of low oil prices in 2008 and 2013, and due to the implementation of a set of reforms by the state, and public revenues continued to rise.

**Figure (02): Evolution of public expenditures 1990-2021**

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

An econometric study of the impact of financial policy on economic growth in Algeria, 1990-2021   **30**

The data indicates that Algeria's public expenditures for the period from1990 to 2021 witnessed an increase due to the increase in current and capital spending, a decline in the financial budget deficit, and an increase in public revenues, meaning an increase in spending on public services, education and health expenditures, and both security and economic affairs expenditures, as well as on social sectors by fighting poverty and Achieving justice among members of society. And the decrease in the value of public expenditures is due to the oil price crisis, as the state budget experienced a deficit, which affected its revenues.
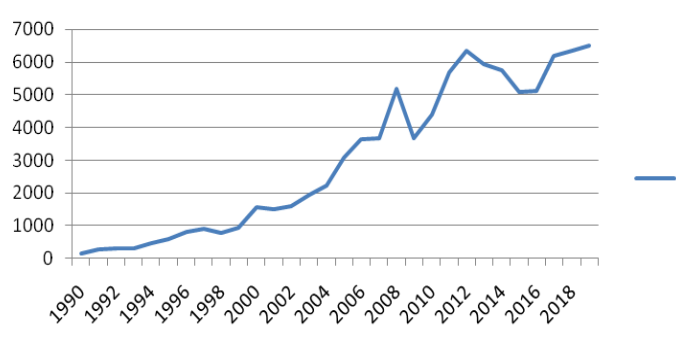
Figure (03): GDP Evolution 1990-2021
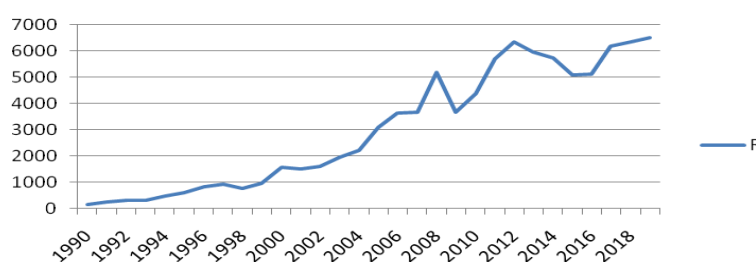
Source: Prepared by the researcher based on the outputs of Excel

The data show that the gross domestic product for the period from1990 to 2021 witnessed an increase, and this is due to the availability of a suitable climate for investment and an increase in the flow of capital to the local economy. The decline in GDP is due to the slowdown in domestic demand for services, the continued financial and administrative independence of a number of public institutions, and the cessation of diverting their resources to the budget.

Figure (04): Evolution of government spending 1990-2021

Source Prepared by the researcher based on the outputs of Excel

Data show that government spending for the period from 1990 to 2021 witnessed a great rise and development.

I-2 stability test
-$H0$: the presence of a unit root
 -$H1$: No root module.

Table (01): Stability test for the variables of the model under study using (pp):

At Level					
		R	PIB	G	PE
With Constant	t-statistic	-0.0585	0.6496	-1.6030	1.1686
	Prob.	0.9451	0.9887	0.4683	0.9971
		n0	*	n0	n0
With Constant & Trend	t-statistic	-2.8911	-2.0883	-1.8558	-1.7157
	Prob.	0.1797	0.5305	0.6511	0.7183
		n0	*	n0	n0
Without constant and trend	t-statistic	1.9472	3.3640	0.0108	3.2094
	Prob.	0.9854	0.9995	0.6780	0.9993
		n0	n0	n0	n0
At First Difference					
		d(R)	d(PIB)	d(G)	d(PE)
With Constant	t-statistic	-7.1217	-4.5644	-3.9001	-5.6883
	Prob.	0.0000	0.0012	0.0060	0.0001
		***	***	***	***
With Constant & Trend	t-statistic	-7.0686	-4.5836	-3.8093	-6.1794
	Prob.	0.0000	0.0055	0.0311	0.0001
		***	***	**	***
Without constant and trend	t-statistic	-5.3816	-2.9571	-3.9680	-4.5256
	Prob.	0.0000	0.0046	0.0003	0.0001
		***	***	***	***

Source: Prepared by the researcher based on the outputs of Eviews 10

Through the table (01) we note the following:

An econometric study of the impact of financial policy on economic growth in Algeria, 1990-2021　　　　　　　　　　　　　　　　　　　　　　　　**32**

At the level: we note that the probability is greater than the degree of significance (5%) for all variables, which means accepting the null hypothesis H0 (the existence of a unit root) ie each of the G .PE. PIB R series. unstable at zero.

At the first difference: we notice that the probability is smaller than the degree of significance (5%) for all variables, which means rejecting the null hypothesis H0 (there is no unit root) ie each of the PIB. PE.G.R series. Stable at the first difference (Al-Mosbeh, 2006). The stability test can be summarized in the following table:

Table No. (02): the degree of integration of the variables of the model under study

PIB	G	PE	R	variants
I(1)	I(1)	I(1)	I(1)	degree of integration

Source: prepared by the researcher based on the outputs of Eviews

Statistical results and critical values are shown 5% for the Phillips-Berron test at the first difference, that the null hypothesis claims the existence of a unit root (i.e. the instability of the time series) for each variable of the study. It is clear that all of them (gross domestic product, public expenditures, government spending, revenues) are stable and do not contain a unitary root, as the null hypothesis was rejected. This means that the variables are integrated of the first degree. I(1) and these results fit into standard theory Which assumes that most of the macroeconomic variables are not static in the level, but become static in the first difference. Since all variables are integrable of the first degree, the test application condition is thus fulfilled ARDL. The ARDL model can be written as follows:

$$\Delta PIB_t = a_0 + \sum_{j=1}^{p1} \beta_j \Delta PIB_{t-j} + \sum_{j=0}^{p2} \gamma_j \Delta R_{t-j} + \sum_{j=1}^{p3} \delta_j \Delta PE_{t-j}$$
$$+ \sum_{j=0}^{p4} \lambda_j \Delta G_{t-j} + \pi1\, PIB_{t-1} + \pi2\, R_{t-1} + \pi3\, RE_{t-1}$$
$$+ \pi4\, G_{t-1} + \pounds_t$$

Δ The first difference.

a_0: Fixed .

$\pi1 \dots \pi5$ The estimates of the independent variable slow down for one year at the level.

1-2-3- A test that improves the cointegration relationship in the long run:

Demonstrates a model ARDL that economic growth can be explained by its lagging values, and the lagging values of the independent variables. According to the Pesaran and Al cointegration of the ARDL model is based on Test the following hypothesis:

$H0: \pi1 = \pi2 = \pi3 = \pi4 = \pi5 = 0$

: There is no long-term relationship $H0$

$H1: \pi1 \neq 0, \pi2 \neq 0, \pi3 \neq 0, \pi4 \neq 0, \pi5 \neq 0$: A long-term H1 relationship exists

The test is based on a statistic F-statistics, the resolution is as follows:

✓ If the value F-stat is greater than the upper bound of the critical values, we reject the null hypothesis that there is no cointegration relationship in the long run.

✓ As for if F-stat is less than the minimum critical values, then we accept the null hypothesis that there is no cointegration relationship in the long run.

✓ As for if the calculated value is statistical F-stat lies between the upper and lower limit of the critical values proposed by Pesaran and Al (2001), then we cannot decide. The statistical value of cointegration is F = 6.477358, and the limits of the critical values at different degrees of significance proposed by Pesaran and Al (2001) are shown in the following table:

Table (03): Boundary tests

F = 6.477358		
critical values		
Moral levels	bottom border	upper limit
10%	2.37	3. 2
5%	2.79	3.67
2.5%	3.15	4.08
1%	3.65	4.66

Source Prepared by the researcher based on the outputs of Eviews

The F-stat is greater than the upper limit of the critical value at various significant degrees, meaning that the sum of the variables (gross domestic product, public expenditures, government spending, revenues) explain economic growth, and therefore we reject the null hypothesis and accept the alternative hypothesis of the existence of a long equilibrium relationship term.

1-2-4- Estimating the Autoregressive Distributed Time Lapse Model:

depending on Akaike Info Criterion (AIC) Hysteresis periods were determined, and ARDL (4.3.4.3) was found to be the optimal model.

Table (04): Estimating the distributed time-lag autoregressive model

Variable	Coefficient	std. Error	t-statistic	Prob
Short run: Dependent Variable: PIB				
CointEq(-1)*	-1.162740	0.172677	-6.733610	0.0001
Long-run: Dependent Variable: PIB				
G	19.5982	59.49771	3.220261	0.0092
PE	-0.121381	0.419683	-.289222	0.7783
R	3.250234	0.568027	5.721970	0.0002
C	-22,828	5.495433	-2.629582	0.0252
R-squared=0.976289 AdjustedR-squared=0.876849 SE=0.915198 SSR= 10.05104 Prob(F-statistic)= 0.000000 DW= 2.833039				

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

An econometric study of the impact of financial policy on economic growth in Algeria, 1990-2021

The results shown in the table indicate that the error correction limit represented by-1.162740= CointEq(-1) This negative sign confirms the convergence of equilibrium from the short run to equilibrium in the long run. And the test probability (0.0001) is significant, and this means that 84% of the short-term errors can be corrected in the unit of time (year) in order to return to the long-term equilibrium situation. That is, when the gross domestic product, public expenditures, and government consumption spending deviate The final and revenues in the short run (period t-1) from their equilibrium value in the long run, the equivalent of 84% of the deviation is corrected in the period (t). The results also show the following:

● Positive effect of government spending on economic growth in the long run, estimated by (19.5982)

This explains the state's implementation of an expansionary policy, whether in social services, health and education, in order to create public benefit, by expanding the productive capacity of national production, which creates total demand for consumer goods, which in turn stimulates investment, and this affects the level of employment, which prompts individuals to double their consumption. Because of the availability of income and the latter raises the national product. Which translates into positive growth rates for the country.

● A negative effect of public expenditures on economic growth in the long run, which was estimated by (-0.121381) and it is explained economically that the revenues of the whole country are based on only one sector (the fuel sector). If we follow the development of international fuel prices, we will realize that they directly affect Algeria's public revenues through petroleum taxation and, consequently, public expenditures, due to the absence of adjustments in the structure of public spending. This is confirmed by the equipment expenditures, which are programmed for investment allocated to the economic sectors of the state in order to reach sustainable development, but in this case - Algeria - the majority of its investments are allocated to one sector, which is the hydrocarbons sector.

● A positive effect of revenues on economic growth in the long run, estimated by (3.2502) This is due to the increase in oil revenues, which represent the most important source of the government in terms of contribution to budget resources, as well as the increase in the proceeds of tax revenues.

So the estimated equation becomes as follows:

PIB=19.5982*G-0.1214*PE+3.2502*R-22.828

1-2-5- Autocorrelation Test for Errors:

H0: No serial autocorrelation of errors

H1: There is a serial autocorrelation of errors

Table(05): Autocorrelation test for errors.

F-statistic	0.021188		0.9791
		F-statistic	
Obs*R-squared	0.136995	Probability	0.9338

Source Prepared by the researcher based on the outputs of Eviews

shown by test (Breusch-Godfrey (LM-Stat) There is no autocorrelation in the residual regression equation, so that the null hypothesis was accepted, and this is due to the fact that the test probability is greater than the different degrees of significance 1%, 5% and 10%. .

1-2-6-testARCH for unstable error variance:

H0: No variance error limit difference

H1: There is a serial autocorrelation of errors

Table (06): ARCH test for instability of error variance.

| F-statistic	3.236768		0.0851
		F-statistic	
Obs*R-squared	3.084191	Probability	0.0791

Source Prepared by the researcher based on the outputs of Eviews

shown by testing ARCH that the probability values are greater than the different degrees of significance 1%, 5% and 10%, means acceptance of the null hypothesis, therefore the model is acceptable in terms of the problem of instability of variance.

1-2-7- Testing the stability of the model(Stability Test (Recursive Estimates):

This test is used to find out that the data used in this model are free of any structural changes in it, and accordingly we will use the cumulative sum test for residuals (CUSUM).

Figure (05): CUSUM model stability test (4.3.4.3)ARDL
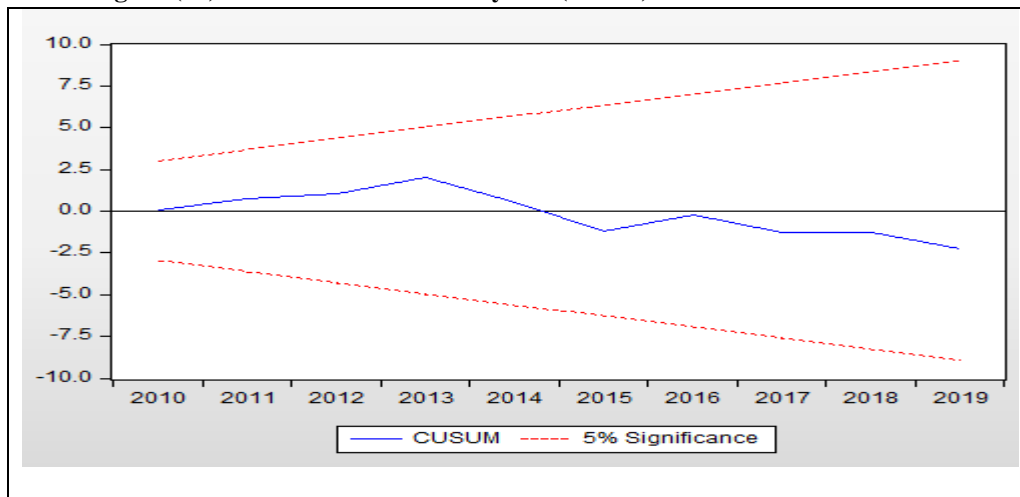
Source: Prepared by the researcher based on the outputs of Eviews

Through the figure, it became clear the extent of the stability of the variables over time, as the cumulative aggregate values fall within the confidence limits (between the two lines), i.e. the estimators are stable over the time period1990-2021.

1-2-8- Granger's causality test:

Granger test is used in ascertaining whether there is a feedback relationship or an exchange relationship between two variables, in the case of time series data:

- The results of the cue betweenPIB, and G:

An econometric study of the impact of financial policy on economic growth in Algeria, 1990-2021

Since the probability ((0.5283) is greater than the significance score (5%), which means we accept the null hypothesis, meaning that economic growth causes government spending, and since the probability is (0.4262) greater than the significance score (5%), we accept the null hypothesis, in other word GDP causes government spending . This is because the state intervenes by expanding government spending, which affects economic growth

- <u>The results of the cue betweenPE and PIB:</u>

There is a significant causal relationship at the level10% of the PE variable towards the economic growth rate, F stat, is greater than the critical values of the Fisher social PIB

- <u>The results of the cue betweenR and PIB:</u>

There is a significant causal relationship at the level1% and 5% of the R variable in the direction of the PIB indicator because the F stat is greater than the critical values of Fisher and the probability value is less than 0.05 and also 0.01

- <u>The results of the cue betweenR and G:</u>

There is a significant causal relationship at the level10% of the variable R towards the variable G.

- <u>The results of the cue betweenPE and R:</u>

There is a significant causal relationship at the level1% of the variable R towards the variable PE, because the Fstat statistic is greater than the critical values for Fasher, and this confirms the existence of a financial policy in Algeria

Conclusion

Through the study that we have done, we have shown the great importance that fiscal policy acquires, as it is the main engine for activating the economy and achieving economic growth. We have tried to show the extent of the impact of fiscal policy in Algeria during the period between1990-2021And we reached the following results:

Research results:

● Positive effect of government spending on economic growth in the long run, estimated by (19.5982),This explains the state's application of an expansionary policy, whether in social services, health and education, in order to create public benefit, by expanding the productive capacity of national production, which creates total demand for consumer goods, which in turn stimulates investment, and this affects the level of employment, which prompts individuals to double their consumption. Because of the availability of income and the latter raises the national product. Which translates into positive growth rates for the country.

● A negative effect of public expenditures on economic growth in the long run, which was estimated by (-0.121381 and it is explained economically that the revenues of the whole country are based on one sector only (the fuel sector). If we follow the development of global fuel prices, we will see that they directly affect Algeria's public revenues through petroleum taxation and thus on public expenditures due to the absence of modifications in the structure of public spending, and this is confirmed by the equipment expenditures that are programmed for investment allocated to the economic sectors of the state in order to reach sustainable development, but In this case - Algeria - the majority of its investments are allocated to one sector, which is the hydrocarbon sector.

- A positive effect of revenues on economic growth in the long run, estimated by (3.2502) This is due to the increase in oil revenues, which represent the most important source of the government in terms of contributing to the budget resources, as well as the increase in the proceeds of tax revenues.

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