

*The impact of fiscal policy on economic growth in Algeria, an
econometric
study during the period 1990-2022
using the ARDL model*

Mayssa meslem*

Economic strategies and policies in
Algeria Msila- Algeria

Mayssa.meslem@univ-msila.dz

Imane lazazi

Laboratory of development
policies and prospective studies-
Bouira- Algeria

i.lazazi@univ-bouira.dz

Fella djerbal

Economic strategies and policies
in Algeria Msila- Algeria

Fella.djerbal@univ-msila.dz

Abstract

The study aims to measure the extent of the impact of fiscal policy on economic growth in light of the current economic transformations in Algeria, and the role that fiscal policy plays in achieving the desired objectives through addressing crises and activating economic activity. This is done using the Autoregressive Distributed Lag (ARDL) model. The study concluded the following results: operating expenses and capital expenditures have a positive and significant impact on per capita gross domestic product, while tax revenues have a negative impact on it.

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* mayssa meslem

1. Introduction

The evolution of the role of the state has led to an increase in its financial activity, providing justification for expanding its expenditures and obtaining the highest possible revenues to cover these expenses. When the state uses its revenues and expenditures to influence economic activity, it employs one of its important policies, namely fiscal policy. The latter is considered one of the most important tools of economic policy on which the state relies to achieve its economic and social objectives.

It is an economic truism that economic development cannot be achieved without achieving a significant rate of economic growth. Economic growth is the fundamental factor in measuring the progress and advancement of countries. Developed countries are characterized by high rates of economic growth, unlike developing countries, which are characterized by low growth rates, except for some oil-producing countries where their growth rates are influenced by oil revenues.

Since the industrial revolution, many countries have achieved tremendous economic and social progress. This economic and social progress is what is referred to as economic growth. Based on this, economic growth can be defined as the most important policies for any country, whether advanced or developing, due to its comprehensive treatment of the economy on both the domestic and international levels. This policy plays a crucial role in establishing the basic components of economic growth.

Problematic:

How did fiscal policy affect economic growth in Algeria during the period 1990-2022?

The importance of our research is evident in the fact that Algeria, like other developing countries, needs to achieve sustainable economic growth in addition to its main source of economic growth (the hydrocarbon sector). Furthermore, the role that fiscal policy can play in increasing and preserving economic growth when used effectively is crucial. Its importance also lies in the fact that Algeria has significant financial resources in recent years, resulting from the rise in oil prices. This enables the state to intervene and have a greater impact on economic activity in order to achieve the necessary economic growth for economic development.

Objective of the study : this study aims the extent of the impact of fiscal policy on economic growth in Algeria during the period (1990-2022), as well as to identify the key aspects of the budget that affect growth. Additionally, the research aims to propose some mechanisms through which this policy can be activated to achieve economic growth.

First: the theoretical framework of economic growth and financial policy

I. The concept of economic growth and its types

Economic growth has become the focus of many studies, both theoretical and applied, and it includes several types, including natural, intensive, expanded, transient and planned growth.

2. Definition of economic growth

Economic growth has become the focus of many studies, both theoretical and applied, and it includes several types, including natural, intensive, expanded, transient and planned growth.

2.1 Definition of economic growth

Economic growth is the increase in the percentage ratio of overall production, calculated at constant prices, i.e. the real increase in national income. A country that relies on the production and export of oil, gas, coal, coffee, and iron can achieve economic growth by increasing the production of these resources, provided that the prices of these resources do not decrease in the global markets. (charkaoui, 2015, p. 46)

Economic growth refers to the continuous increase in the Gross Domestic Product (GDP) or real national income, which results in an increase in the average per capita income (ajmia, imane , & ali , 2008, p. 77)

Economic growth can also be defined as the increased ability of an economy to provide goods and services over a period of time, regardless of the source of this provision locally or externally (houchiar, 2005, p. 347)

As Bonnet says: "economic growth is nothing but a process of spontaneous economic expansion, carried out under fixed and specific social organizations, measured by the magnitude of the quantitative changes taking place According to Schumpeter, " economic growth is a gradual change that occurs over the long term as a result of a quantitative increase in resources « (MOSTAPHA & SOUHIR , 1999, pp. 39-40)

Economic growth is defined as the increase in the productive capabilities in a country resulting from an increase in the quantity or improvement in the use of economic resources, or through the development of technology used in production. The overall output of the economy is achieved with the increase in population growth, which leads to an increase in the labor supply, as well as with the accumulation of capital through savings and investment. Additionally, growth occurs with the discovery of additional resources and, finally, in the case of technological advancement

(ALAOUI, HASSAN, & KADEM, 2009, p. 281)

2.2 Types of economic growth

There are several types of economic growth: extensive growth, intensive growth, natural growth, transient growth, and planned growth.

2.2.1 Extended economic growth: consists in the fact that the income growth is equal to the population growth rate and therefore the per capita income is static‘

(KADOUR, 2013, p. 65)

2.2.2 Intensive economic growth: in this particular type, we find that income growth exceeds the growth of the population, and therefore individual income increases‘

2.2.3 Natural economic growth: or what is called spontaneous growth, which means that it occurs in the economy of a country without any prior scientific planning, and this type is characterized by being slow and gradual in the form of objective processes in successive historical paths, and it is known that the phenomenon of spontaneous growth occurred historically by moving from the Society of capitalism, and these processes can be accomplished in four stages as follows:

The first process: means sequentially in the social division of labor, that is, to move from the stage of Agriculture to

Manual industry and then to the major mechanized industry.

- **The second process:** it is related to the initial accumulation of capital, at first it was focused on serving

Foreign trade of the state was subsequently transformed into industry.

- **The third process:** it concerns the wide spread of the production process not only to satisfy the needs of the product, but also

To go beyond it for the purpose of exchange and this is what has driven the growth of communities historically.

- **The fourth process:** its main objective is the formation of the internal market, where each product has a market with supply and demand for it, and this market also ensures the preparation for the establishment of a wide national market.

Through a closer examination of these processes and a comparison between the economies of developed and emerging countries, it can be said that the latter went through these processes in part, which resulted in underdevelopment and lack of development, both economically and socially, as for the developed capitalist countries, their sectors have experienced accelerated growth with high flexibility, especially in the social and cultural sphere.

-Transient growth: it is a non-permanent growth that disappears with the disappearance of the causes, that is, it is a growth that appears due to factors, whether internal or external, and this type of growth is characterized by instability and extinction once these factors are gone, and the best example of it is specifically the Arab countries (growth without development):

-Planned growth: it is the opposite of natural growth that occurs spontaneously, as this type occurs as a result of comprehensive scientific planning of the country's resources and needs, and the strength and effectiveness of planned growth depends on the capabilities of planners and the realism of the plans drawn, in addition to the effectiveness of implementation and follow-up and the participation of the people in the planning process at all levels. (Placeholder2)

3. Fiscal policy and its objectives

Fiscal policy is defined as a set of measures taken by government authorities to adjust the size of expenditures or tax revenues in order to serve certain economic goals, such as addressing inflation and unemployment.

3.1 Definition of fiscal policy

The financial policy of the state concerns the methods by which the government seeks to achieve its financial goals, and both government expenditures and revenues represent both sides of the government's financial policy, which is summarized in the general budget of the state, on the basis of which the aspects and size of public expenditures are determined and how to cover these expenses from state revenues or borrowing from the domestic or foreign market. (KHALIFA, 2010, p. 23)

According to Paul Samuelson fiscal policy is a process in which taxes and government spending are used to help smooth out fluctuations in the economic cycle to maintain economic growth and a high degree of employment free from hyperinflation or deflation. Thus, fiscal policy along with monetary policy is one of the basic components of the economic policy pursued by public authorities, this policy uses budget tools such as budget

expenditures and revenues, with the aim of reviving slow growth and maintaining the main macroeconomic balances. (Bouthevillain, Dufrénot,, Frouté, & Paul, 2013, p. 20)

Fiscal policy is one of the most important and prominent means that the state relies on to influence economic activity in order to achieve the goals it seeks, such as economic and social goals, it is part of economic policy, which depends on the use of public expenditures and public revenues in order to influence economic activities to promote the national economy. (DARDOURI & LGHLITI, 2018, p. 13).

3.2 Objectives of fiscal policy

Fiscal policy aims to achieve the goals of the magic square: full employment, price stability, economic growth and external balance. It also targets many social, cultural, educational and health goals.

3.2.1 Fiscal policy and short-term goals:

This type of fiscal policy is inspired by Keynesian policy, which considers that demand is the determinant of the level of production and the organization of economic activity, actions should be taken on the various components of aggregate demand (private consumption, public consumption, investment and exports).

-In case of economic recession aggregate demand is insufficient to allow the full employment of factors of production, the state can then practice increasing demand by pursuing an expansionary fiscal policy by increasing public spending, which affects the level of public consumption and Public Investment

- In a boom, the level of aggregate demand is very high in relation to the total supply, and the economy faces inflationary trends. In this case, the state practices a policy of reducing aggregate demand by following a deflationary fiscal policy by reducing public spending and increasing taxes.

3.2.2 Fiscal policy and structural objectives:

Structural fiscal policy aims to bring about profound changes in the economic structures and the productive apparatus of the country, it affects only the investment decisions of companies (i.e., the supply side) and its effects appear only in the long term. The state can encourage the creation of new companies by granting subsidies or tax exemptions, and it can also support and enhance the long-term competitiveness of local companies by partially financing research and development to improve the quality of production (Fiscal Policy and long-term growth, june 2015, p. 21)

Social transfers are meant as a redistribution of income, which consists of taking a larger part of the incomes of economic agents who are in a better position and transferring it to less wealthy economic agents. As an example, we mention: family compensation, pensions, health and maternity insurance benefits, housing assistance, Student Assistance... (DARDOURI & LGHLITI, 2018, p. 14)

Fiscal policy has a major role in the income distribution process by using its tools of expenses and revenues to initially influence the initial distribution of income, i.e., setting the wage ceiling, profit and interest rates and determining the prices of factors of production. After all these stages, the state redistributes income for the benefit of the disadvantaged classes by directing public spending to establish and establish service facilities and providing subsidies of various kinds, High taxes are also imposed on high-income earners and on low-wage and low-wage earners. The state attaches great importance to the distribution of income and influences this process using fiscal policy in order to achieve the greatest fairness in the income distribution process (DARDOURI & LGHLITI, 2018, p. 14)

3.3 Financial policy instruments:

The instruments of fiscal policy are represented by three main instruments: public expenditures, public revenues and the general budget, used in order to achieve the main goals of the state.

The fiscal policy is to ensure and work to increase public revenues and direct public spending, so that there is a balance between the two sides, which is what we have the general budget of the state (DARDOURI & LGHLITI, 2018, p. 8)

3.3.1 General expenses:

Public expenditures are defined as those amounts of money spent by a public authority (government and local communities) or it is a monetary amount spent by a public person with the intention of achieving a public benefit. It can also be defined as a monetary amount by a public body with the aim of satisfying a public need. (MOHRAZI, 2005, p. 65)

Economic division of general expenses:

Previously, public expenditures were limited and directed to the provision of certain services carried out by the state. However, with the development of the role of the state and its transformation from the Guardian state to the intervening state, the importance of Dividing expenses has increased due to the diversity and increasing public expenditures.

The Algerian legislature divides the public expenditures of the state into operating expenses and investment expenses.

Type of operating expenses: administrative expenses related to the disbursement of salaries and operating expenses such as wages

The rent of the factory, management, water, etc. are necessary to ensure the functioning of the government. This type of spending represented the basic expenses of the state at the stage of the economic neutrality of the state and the economic freedom of the units, however, this type of spending does not lead to an increase in the national wealth of the national economy only in the narrowest limits, namely, an increase in effective aggregate demand. (hassan, p. 62)

The executive authorities must work to reduce management expenses as long as they are unproductive and destroy the wealth obtained through taxes. However, the increase in this type of expenses cannot be avoided, as it ensures the normal and proper functioning of various public interests that must remain and be guaranteed compulsorily (MOHRAZI, 2005, pp. 77-78)

Processing expenses: are called investment or capital expenses and is the expenditure on equipment

Equipment and productive goods (fixed capital), which affects the economic structure, it produces an increase in national wealth. For example, we find that the construction of a certain dam to store water leads to the generation of electricity, which creates a new economic resource for the national economy resulting from increased public spending. (hassan, pp. 62-63)

The British economist John Maynard Keynes proved that in a recession, investment expenditures restore the overall economic balance through the role played by the investment multiplier. If we assume that the state has completed a certain investment (construction of a highway) during a period of economic crisis, the investment public expenditure is by distributing wages to workers and making requests for raw materials from suppliers. Customers and suppliers then direct the income earned to purchase consumer goods or replenish their stocks, thereby giving new incomes to merchants and industrial producers, who in turn will use these incomes (MOHRAZI, 2005, pp. 78-79)

3.3.2 General revenue:

In order for the state to exercise its economic and social role and carry out public expenditures, it must determine the sources of public revenues, which are considered incomes for the state that enable it to cover its public expenditures in various economic and social aspects (AMARA, 2015, p. 32)

3.3.3. Taxes:

A tax is a monetary levy that an individual forcibly pays to the state or one of the local public bodies as a final contribution from him to bear public costs and burdens without having a special benefit for him in return for paying the tax, and this definition is close to the most famous definition, which is the definition given by Professor Gaston GEZE GASTON GEZE, as a tax is a monetary performance imposed by the authority on individuals in a final way and free of charge in order to cover public burdens (HACHICH, 1985, p. 161)

It is characterized as an effective tool used in the redistribution of income and wealth, maintaining the general level of prices and financing the general budget, in addition to being an important source of government income, it is an effective tool in achieving economic stability and directing the economy and attracting investment (KHELIFA, 2010, p. 27)

3.3.4 Public debt:

The government needs to borrow from various sources when current revenues are below the level of public expenditures and therefore public debt refers to loans incurred by the government to finance its activities when other sources of public income fail to do so. Since the debt must be repaid with interest, it does not constitute income, but public spending.

The state generally borrows to meet three types of expenses:

- Public debt to meet the budget deficit
- Public debt to meet emergencies such as war
- Public debt for development (ahmed & khelifa al ziyadat, p. 27)

3.3.5 General budget:

The state budget is a financial organization that corresponds between public expenditures and public revenues, determines the relationship between them and directs them together to achieve fiscal policy.

In other words, the budget, in its strict sense, consists of details related to various types of revenues (in particular, taxes) and various types of expenditures proposed by the executive branch (government) to the legislative branch (represented in the Houses of Representatives), The general budget can be viewed as a financial plan that appears in the budget document, which is a detailed estimate of state revenues and expenditures for a future period, which is usually a year (HACHICH, 1985, pp. 29-30)

4. Econometric study: studying the impact of fiscal policy on economic growth

4.1 Definition of study variables:

In this axis, the impact of fiscal policy on economic growth in Algeria during the period between 1990-2022 will be presented, and through several theoretical and experimental considerations mentioned, our general model of the equation of economic growth will take the following form:

$$\text{GDP} = \alpha + \beta_1 \text{GR} + \beta_2 \text{GE} + \beta_3 \text{RE} + \varepsilon$$

Table 1. Description of study variables

Variables	Description	source
GDP	Dependent variable: We used this index as an expression of economic growth and we symbolized it with a GDP expressed in billion to the current prices of Algerian dinars.	World Bank data
GR	Operating expenses	World Bank data
GF	Tax revenues	World Bank data
GE	Processing expenses	World Bank data

Source: Prepared by the researchers

4.2 Study the stability of variables

To find out whether the time series is stable or not, there are several tests, the most important of which is the unit test by phillips-perron, and it aims to examine the properties of the time series, confirm the extent of its stillness and determine the rank of integration of each variable, and this test is based on the following hypothesis:

H0: there are a unit root in the series, that is, the series is unstable.

H1: there are no unit root in the series, that is, the series is stable.

So that this test is done on the original time series (at the first level), if it does not stabilize at the level, we go for the first differences and so on until it stabilizes and the null

hypothesis that there is a unit root is rejected if the absolute value calculated for the test is greater than the critical absolute value at the level of a significant 5% or if the probability value

Table2. Results of unit root tests using the pp test

variables	Test PP		integration
	First difference	level	
GDP	-4.484014 0.0012	0.245296 0.9713	I(1)
GR	-3.041927 0.0420	2.016739 0.9998	I(1)
GF	-5.639895 0.0001	-0.290181 0.9157	I(1)
GE	-8.876034 0.0000	-0.144476 0.9358	I(1)

Source: prepared by researchers using the program Eviews 12.

The values between the brackets represent the values of probability (p- value)

We note from Table No. (02) that the probabilities Ts for the variables GDP, processing expenses, management expenses, revenues are less than 5%, i.e. rejects the null hypothesis and accepts the alternative hypothesis H1 there is no unit root and the series is stable at the first difference.

4.3 Joint integration test (boundary test)

The existence of a common integral between the variables is verified by applying a boundary test, which is based on a test and to reveal the equilibrium relationship in the equation through the following assumptions

$H_0 : \sigma_1 = \sigma_2 = \dots = \sigma_n$.(There is not a common integration)

$H_1 : \sigma_1 \neq \sigma_2 \neq \dots \neq \sigma_n$ (There is a common integration)

This test is carried out by means of a non-standard Fisher F distribution, so the rejection or acceptance of the null hypothesis depends on the comparison of the calculated Fisher value and the results of this test are shown by the table

4.4 ARDL Bounds test estimation results:

Test of cointegration using Test Bounds:

To determine the existence of long run relationship among the variables of the study the Bound test procedure was used. The bound test results were presented in Table 3 below. (parasan.M, SHIN Y, & Smith R, 2001)

Table 3.

ARDL Bounds Test		
Null Hypothesis: No long-run relationships exist		
Test Statistic	Value	K
F-statistic	11,41	3
Critical Value Bounds		
Significance	I0 Bound	I1 Bound
10%	2,37	3, 2
5%	2,79	3,67
2,5%	3,15	4,08
1%	3,65	4,66

Results of cointegration test using Test Bounds method

Source: Prepared by the researchers based on the outputs of evIEWS 10

I (0) and I (1) represent the upper and lower boundaries of critical values, Previous results show a common integration or long-term balance between variables, as F-stat's=11,41calculated value is greater than the I (1) upper limit of scheduled value at a morale level, 2.5%, 10%, 5%, and so the imposition of nowhere is denied. (H0), alternative imposition H (1) is accepted, which confirms the study's hypothesis that there was a long-term balancing relationship with the model variables in Algeria during the period 1990-2022

4.5 Estimation of the ARDL model

Table 4. Estimate ARDL model

	Coefficient	Std_Error	t_statistic	Prop
LGDP(-1)	1.069797	0.055312	19.34105	0.0000
GE	0.474695	0.155900	3.044864	0.0077
GE(-1)	-0.540546	0.144912	-3.730159	0.0018
GE(-2)	-0.954968	0.224912	-4.24953	0.0006
GE(-3)	1.072388	0.368473	2.910359	0.0102
GE(-4)	-1.133151	0.289987	-3.907593	0.0013
GF	-0.256995	0.105448	-2.437175	0.0269
GF(-1)	0.295266	0.138042	2.138962	0.0482
GF(-2)	0.576715	0.188870	3.053496	0.0076
GF(-3)	-0.853611	0.163899	-5.208153	0.0001
GR	0.090484	0.181288	0.499116	0.6245
GR(-1)	0.513912	0.162104	3.170256	0.0059
C	-4.03211	4.900111	-0.821846	0.4232

Source: prepared by researchers using the program.Eviews 12.

It can be seen from the results of the estimation in the table above that the explanatory capacity of the model by the corrected determination coefficient amounted to 0.99, which It means that the explanatory variables were able to explain the GDP by a value of 99%, which is a good percentage for analysis and study, as for the overall morale of the model through the Fisher test, it reached 980.1997 with an accompanying probability (0.000 less than 5) This means rejecting the null hypothesis, that is, the model as a whole is statistically acceptable, as for the statistic $2.24 = DW$, which is an unreliable result because the model contains a dependent variable that is time-delayed as one of the independent variables, which contradicts the conditions for using the DW test, which means that alternative tests should be used to ensure that there is no self-correlation and to confirm the validity of the model.

4.6 Appreciating the relationship in the long and short-term:

After confirming the existence of a long-term equilibrium relationship between both independent variables and GDP, we estimated the long-term relationship and the results are shown in Table .5.

Table 5. The results of estimating a relationship in the long-term and short-term

	Coefficient	Std_Error	t_statistic	Prop
LGDP(-1)	-4.033311	4.900115	0.0000	0.0000
GE	0.069797	0.055312	1.261864	0.2251
GE(-1)	-1.081583	0.360877	-2.997092	0.0085
GE(-2)	-0.238626	0.094209	-2.532951	0.0222
GE(-3)	0.604396	0.146568	4.123665	0.0008
GE(-4)	0.474695	0.155900	3.044864	0.0077
GF	1.015732	0.274986	3.693761	0.0020
GF(-1)	0.060764	0.320541	0.189566	0.8520
GF(-2)	1.133151	0.289987	3.907593	0.0013
GF(-3)	-0.256995	0.105448	-2.437175	0.0269
GR	0.276896	0.132315	2.092703	0.0527
GR(-1)	0.853611	0.163899	5.208153	0.0001
C	0.090484	0.181288	0.499116	0.6245

Source: prepared by researchers using the program.Eviews 12.

4.7 Test of heteroscedasticity

The presence of varying variance is a systematic pattern of errors where the variance in errors is not constant. The results of the ARCH test indicate the stability of error variance through the probability value of the chi-square, which was 0.875270 and is greater than 0.05. With a probability estimate of 0.3495, we accept the hypothesis of homoscedasticity and the absence of heteroscedasticity issue.

As shown in the following table 6:

Table 6. Results of ARCH Test

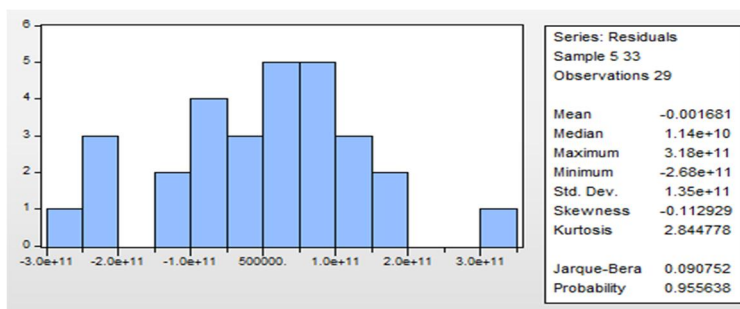
ARCH	F_statistic	Prop, F(1,26)	Obs*R-squared	Prob. Chi-Square(1)
	0.838977	03681	0.875270	0.3495

Source: prepared by researchers using the program.Eviews 12.

4.8 Normality Test: Jarque-Bera Test

The results of this test were as shown :

Fig. 1. Normality Test

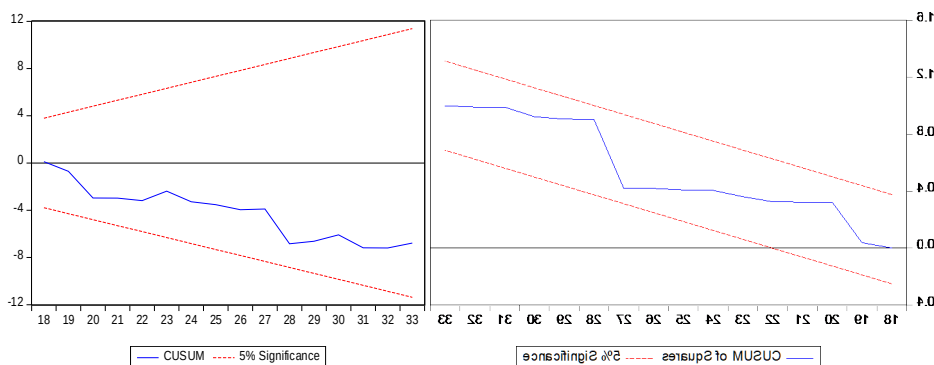


Source: prepared by researchers using the program Eviews 12.

From the table, we observe that the Jarque-Bera statistic is 0.09, which is greater than 0.05. Additionally, the probability value of 0.95 is greater than 0.05 at a significance level of 5%. Therefore, we accept the hypothesis of normality and conclude that the residuals follow a normal distribution.

4.9 Testing the structural stability of the ARDL model

Fig.2. Structural Stability Test Results



Source: prepared by researchers using the program.Eviews 12.

From the figure we can see that both the cumulative sum of the residuals and the cumulative sum of the squares of the residuals are an intermediate line located within the boundaries of the Critical Zone, which indicates the structural stability between the long-term and short-term results.

5. CONCLUSION

Through this study, which aimed to measure the impact of some fiscal policy instruments on economic growth in some countries in Algeria using the ARDL model, we came to the conclusion that the existence of a direct relationship between processing and operating expenses with economic growth, as for revenues, has a negative and significant impact on GDP per capita, according to the economic outlook.

Results:

-There is a statistically significant positive correlation between the variables, indicating a strong interrelationship between GDP and operating and processing costs. This is consistent with economic theory, as countries are highly focused on public spending due to economic fragility and deterioration. This shows that the country's expansionary fiscal policy has had a positive positive impact on the economy by strengthening economic growth through various support programs;

-Considering that general revenue comes mostly from oil revenue and is related to oil price fluctuations, there is a negative impact between general revenue and economic growth;

Based on the results obtained, some recommendations can be made to improve the efficiency of financial policies in achieving economic growth;

-Rationalizing public expenditures and financing investment projects to support economic growth;

-Activating tax revenues through restructuring the tax system and considering tax exemptions, especially in oil-exporting countries and their dependence on oil revenues;

-Investing in human capital through spending on education, research and development, which leads to economic growth.

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