

The Impact of Government Spending on Algerian Economic Growth during the period 1999-2022: An Econometric Analysis

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Abstract :

The study aims to analyze the impact of government spending on economic growth in Algeria during the period (1999-2022), the study results demonstrate a strong positive correlation between government expenditure and economic growth in Algeria during the specified period. This finding highlights the crucial role of expansionary fiscal policies in stimulating economic activity and driving development. Furthermore, the study reveals that government spending has had a substantial positive impact on the Algerian economy and society, contributing to job creation, infrastructure development, and improved public services, ultimately enhancing citizens' living standards and reducing social disparities.

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Mot clé.1: Dépenses Publiques

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O4, H5, C01.

Abstract :

L'étude vise à analyser l'impact des dépenses publiques sur la croissance économique en Algérie au cours de la période 1999-2022. Les résultats de l'étude montrent une forte corrélation positive entre les dépenses publiques et la croissance économique en Algérie au cours de la période étudiée. Cette découverte souligne le rôle crucial des politiques fiscales expansionnistes dans la stimulation de l'activité économique et le développement. En outre, l'étude révèle que les dépenses publiques ont eu un impact positif substantiel sur l'économie et la société algériennes, contribuant à la création d'emplois, au développement des infrastructures et à l'amélioration des services publics, ce qui a finalement amélioré le niveau de vie des citoyens et réduit les disparités sociales.

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1- The introduction:

In the context of the debate on the public sector's impact on the economy and its growth rate, the issue of public expenditure composition has garnered significant attention in both theoretical and empirical literature. This body of work distinguishes between productive and unproductive public spending, where productive spending is generally defined as public investment, while unproductive spending is linked to public consumption (Bhatt & Sardoni, 2021).

The relationship between public spending and economic growth, which is a primary goal of any economic policy and a key indicator of societal well-being, has been a contentious topic in economics over the decades. It continues to spark discussions among policymakers and researchers to this day. Wagner argued that economic growth is the main driver of increased public spending, a view partially supported by various empirical studies (Wahyudi, 2020). Meanwhile, Keynesians contend that government spending stimulates the economy by boosting aggregate demand. However, the Keynesian model also notes that excessive or inefficient government spending can have negative effects on economic growth, such as inflation, rising public debt, and budget deficits. This perspective is supported by other studies (Okunlola, Sani, Ayetigbo, & Oyadeyi, 2024). The study of (Nyasha & Odhiambo, 2019) highlighted that this relationship is not consistent, as it ranges between positive, negative, and neutral effects. However, the general trend leans toward a positive relationship between public spending and economic growth.

In the case of Algeria, the country's economic growth has experienced fluctuations due to global economic crises, prompting the government to adopt effective measures to address these challenges and stimulate the economy. Based on numerous studies indicating a strong relationship between public spending and economic growth, the Algerian government implemented various strategies, including economic recovery initiatives. These include the Economic Recovery Program (2001–2004), the Complementary Program to Support Economic Growth (2005–2009), the Five-Year Program (2010–2014), and the Growth Enhancement Program (2015–2019). However, these policies were suspended on December 31, 2016, due to declining oil prices and the government's shift toward fiscal consolidation. The stated aim of these programs was to stimulate the national economy and boost the economic growth rate (Bouketir, 2019).

- **The problem of the study:**

The research question can be formulated as follows:

How does government spending affect economic growth in Algeria during the period 1999-2022?

To address this research question, it has been divided into several sub-questions as follows:

1- How has government spending evolved in Algeria from 1999 to 2022?

2- What is the relationship between government spending and economic growth during the specified period?

These sub-questions aim to provide a comprehensive understanding of the relationship between government spending and economic growth in Algeria over the specified period.

- **Hypotheses:**

Based on the posed problem and in pursuit of the study's objectives, the hypotheses of the study are as follows.

H1: There may be an increase in government spending over time as a result of the government expanding its role in supporting the economy and stimulating growth.

H2: There may be a positive impact between an increase in government spending and economic growth.

- **Purpose and Importance of the Study:**

This study aims to investigate the impact of government expenditure on economic growth in Algeria during the period from 1999 to 2022. By constructing an econometric model, the study will analyze the causal relationship between these two variables. Furthermore, this research seeks to contribute to the economic literature by providing precise findings on this relationship, which can support policymakers in making more effective fiscal policies.

- **Study Approach:**

This study adopts a research methodology that combines qualitative and quantitative analysis. The qualitative approach will be used to review relevant previous studies and identify knowledge gaps in the literature. The quantitative approach, on the other hand, will involve collecting and analyzing quantitative data from the World Bank using the Autoregressive Distributed Lag (ARDL) bounds testing approach, implemented in EViews 12. This will enable us to determine the nature of the relationship between government spending and economic growth and test the research hypotheses that were previously formulated. Through this integrated methodology, the study aims to make a new scientific contribution to understanding the relationship between the two variables under study.

2- Literature review:

Despite the large number of studies conducted on the relationship between government spending and economic growth, it remains difficult to determine whether an increase in public spending contributes to economic growth. The lack of consensus on the results of previous studies makes this

research highly significant. In this section of the study, we will review the most recent studies related to the relationship between government spending and economic growth, including the study by (Nhemhafuki, 2023) aimed to investigate the impact of government spending on economic growth, using an unbalanced panel data set from 117 countries over the period from 2001 to 2021. The results showed a positive relationship between government spending and economic growth. It also indicated that an increase in government spending leads to an increase in GDP growth, as it boosts aggregate demand for goods and services while stimulating productivity, innovation, and competition. Furthermore, government spending indirectly contributes to enhancing investment, thereby fostering GDP growth.

The study by (Buthelezi, 2023) aimed to investigate the effects of government spending on economic growth in the short and long term in South Africa. It relied on the Error Correction Model (VEC) and Markov-switching dynamic regression using data from 1994 to 2021. The results showed that an increase in government spending in South Africa leads to a reduction in economic growth, which contradicts the Keynesian perspective. This finding aligns with classical theory, which assumes that government spending harms economic growth. The study recommended that local financial authorities restructure government spending to target the productive sectors of the economy in order to achieve macroeconomic goals.

In another context, the study by (Wardhana, Kharisma, & Khairat, 2023) study aimed to analyze the impact of government spending on regional economic output in 33 Indonesian provinces during the period 2016–2021. The study employed the generalized least squares (GLS) method. The results showed that variables such as unemployment, government spending on social protection, average years of schooling, and employment have a significant impact on regional economic output growth. However, spending on education did not have a significant effect on regional economic growth. Accordingly, the study recommended focusing on other sectors, particularly the education sector.

The study by (Poku, Opoku, & Ennin, 2022) analyzed the impact of government spending on GDP growth in Ghana during the period 1970–2016, employing the ARDL methodology. The results indicated a positive relationship between the two variables, revealing a statistically significant positive effect of government spending on GDP growth in the short term, while the effect was statistically insignificant in the long term. Nonetheless, the study confirmed that government spending significantly contributes to driving economic growth in the short term in Ghana. It recommended increasing spending on profitable projects to boost GDP growth in the short term, as well as allocating expenditures to long-term projects to achieve positive effects on future growth.

Moreover, the study by (Tammar, 2021) aimed to investigate the impact of government spending on economic growth over a specific period, using panel data from a sample of 15 developing countries during the period 2005–2019. The results of the study revealed a significant and direct relationship between government spending and economic growth in the developing countries included in the sample, both in the short and long term. This was explained based on effective demand, according to Keynesian theory, which suggests that government spending is one of the components of aggregate effective demand. It positively reflects on GDP through its ability to create new individual incomes, thereby increasing productivity and the consumption of economic agents.

The study by (Chandana, Adamu, & Musa, 2020) examined the impact of both capital and operational government spending in Nigeria on economic growth, using the Autoregressive Distributed Lag (ARDL) model over the period from 1970 to 2019. The study's key findings showed that capital spending positively and significantly influences economic growth in both the short and long term, whereas operational spending has no significant effect on economic growth in either time frame. The study concluded by recommending that the government increase its share of capital spending, particularly on projects directly benefiting community welfare. Additionally, it suggested improving the allocation of operational spending by redirecting resources to productive activities that promote human development in the country.

In another context, the study (Nyasha & Odhiambo, 2019), which aimed to review the theoretical and empirical literature on this relationship. The focus was on examining the literature that assessed the impact of government spending on economic growth. The study categorized the related studies into three groups: positive impact, negative impact, and no impact. The results of the review revealed that the effect of government spending on economic growth is not fixed, as it varies between positive and negative impacts, with some studies finding no impact at all. However, the literature indicates that the general trend points to a positive effect of government spending on economic growth.

Based on the review of previous studies, it is clear that the relationship between government spending and economic growth is complex and may vary depending on the country, time period, and type of spending involved. While most studies find a positive effect of government spending on economic growth, other studies suggest that the impact may be neutral or negative under certain conditions.

Our study differs from other studies in that it focuses on Algeria as a specific geographical area and covers the period from 1999 to 2022,

reflecting the contemporary economic and political context of Algeria. Additionally, our study uses the ARDL model to analyze quantitative data from the World Bank, similar to some previous studies. As for the results, our study hypothesizes a positive relationship between government spending and economic growth in Algeria, which we will verify in the empirical part of this study.

3- Methodology:

This part of the study aims to provide a framework for an econometric study that seeks to analyze the relationship between government spending and economic growth in Algeria during the period 1999-2022. This relationship is considered one of the most important economic issues that concern researchers and policymakers in Algeria, especially in light of the significant economic changes that the country has witnessed during this period.

- **Method and Tools Used:**

This study employs the Autoregressive Distributed Lag (ARDL) bounds testing approach, implemented using EViews 12, for estimation and data analysis. This methodology allows us to overcome the uncertainty regarding the stationarity of time series data, and it can be applied whether the time series are stationary at level, first difference, or a mixture of both. Furthermore, this approach is characterized by incorporating a sufficient number of lags to obtain optimal (Pesaran, Shin, & J. Smith, 2001).

The data Sources were determined based on previous studies and relevant literature, with data collected from the World Bank. The following table presents the study variables and their sources:

Table No 01, Variables and Data Sources.

	Variables	Data Sources
Government spending	Gross National Expenditure (Independent Variable)	(World Bank, 2022)
Economic growth	Gross Domestic Product (Dependent Variable)	(World Bank, 2022)

Source: Prepared by researchers.

- **Stationarity test for time series:**

Unit root testing is a fundamental step in time series analysis. It helps to establish whether a time series is stationary and to determine its order of integration.

Table 2 presents the results of unit root tests for the study variables using both the Phillips-Perron (PP) and Augmented Dickey-Fuller (ADF) tests.

Table No 02, Unit root test for series model variable using ADF & PP.

PP							
Without		With Constant & Trend		With Constant			Variables
At First Differenc e	At Level	At First Differenc e	At Level	At First Differenc e	At Level		
-3.8094 0.0006 ***	0.8282 0.8835 no	-3.9648 0.0262 **	-1.555 0.7792 no	-4.0542 0.0053 ***	-1.4585 0.536 no	I(1)	GDP t-Statistic Prob.
-2.9526 0.0051 ***	0.8209 0.8822 no	-3.6685 0.0467 **	-0.3805 0.982 no	-3.3412 0.0251 **	-1.411 0.5591 no	I(1)	GNE t-Statistic Prob.
ADF							
Without		With Constant & Trend		With Constant			Variables
At First Differenc e	At Level	At First Differenc e	At Level	At First Differenc e	At Level		
-3.8445 0.0005 ***	0.8338 0.8845 no	-4.0685 0.0213 **	-1.4914 0.8029 no	-4.0982 0.0048 ***	-1.4753 0.5278 no	I(1)	GDP t-Statistic Prob.
-3.0103 0.0044 ***	1.1349 0.9284 no	-3.7267 0.0418 **	-0.3805 0.982 no	-3.3768 0.0233 **	-1.4448 0.5427 no	I(1)	GNE t-Statistic Prob.
Notes: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant							

Source: EViews 12 output.

The findings in the table reveal that all-time series variables in this study are integrated of order one (I(1)). Consequently, they become stationary when differenced once at the 5% significance level. This suggests the possibility of a long-run equilibrium relationship, and thus, a cointegration test can be conducted using the bound test.

• **Cointegration testing through ARDL Bound test:**

The objective of this test is to determine whether there is a long-run equilibrium relationship between the dependent and independent variables. The following table presents the parameters of the Bound Test.

Table No 03, ARDL Bounds Test.

Signif.			Bound	F-Bounds Test
10%	5%	1%		
3.02	3.62	4.94	I(0)	6.8601
3.51	4.16	5.58	I(1)	

Source: EViews 12 output.

The results presented in Table 3 show that the calculated F-statistic of 6.8601 is greater than the upper bound (I(1)) at all significance levels. Therefore, we reject the null hypothesis and accept the alternative hypothesis, which states that there is a long-run cointegrating relationship between government expenditure and economic growth in Algeria during the study period.

- **Diagnostic tests for model quality:**

To ensure the quality and reliability of the model used to measure the impact of government expenditure on economic growth in Algeria during the study period and to identify any potential econometric issues, a series of diagnostic tests were conducted. The results of these tests are as follows:

Table No 04, Diagnostic test results for model quality.

Test	Statistics	Value	Prob.
Breusch-Godfrey Serial Correlation LM Test	F-statistic	0.857981	0.4416
Heteroskedasticity Test Breusch-Pagan-Godfrey	F-statistic	0.23932	0.8678
Histogram Normality test	Jarque-Bera	0.91258	0.63362

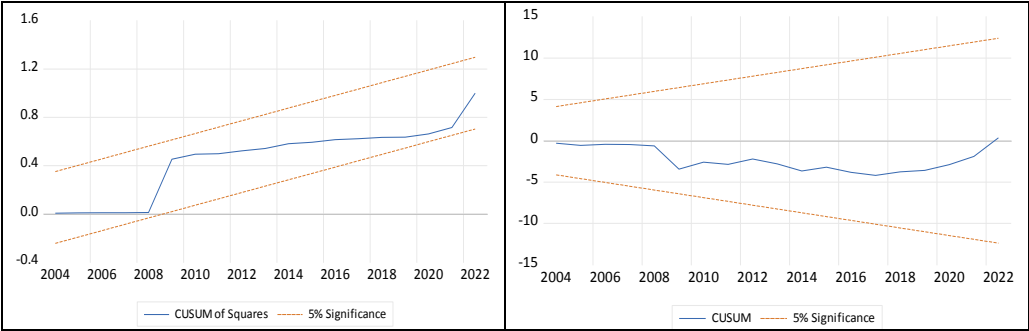
Source: EViews 12 output.

The diagnostic tests confirm that the statistical model used in this study is robust and suitable for use. The absence of autocorrelation and heteroscedasticity, in addition to the normal distribution of the residuals, increases our confidence in the results we obtained regarding the relationship between government spending and economic growth.

- **Structural stationarity test of the model:**

To ensure the validity of the estimated long-run relationships, we conducted diagnostic tests for structural stability. The CUSUM and CUSUMSQ tests were employed to assess the stability of the model's parameters over time. As shown in Figure 1, the test statistics do not exceed the critical boundaries, suggesting that the model is stable and the estimated parameters are reliable.

Figure No 01. CUSUM and CUSUMSQ tests.



Source: EViews 12 output.

• **Error Correction Model: Short-run and Long-run Analysis.**

After determining the lag lengths based on the Akaike Information Criterion (AIC), it was found that the optimal model for this study is ARDL(1,1). The results of the Autoregressive Distributed Lag (ARDL) model are presented in Table 5, which consists of two parts:

Table No 05, Model Estimation Results.

ARDL Cointegrating And Long Run Form				
Dependent Variable: GDP				
Selected Model: ARDL(1,1)				
Cointegrating Form				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.87976	5.172470	2.296728	0.0332
GDP(-1)	-0.606351	0.136584	-4.439386	0.0003
GNE(-1)	0.524601	0.128302	4.088811	0.0006
D(GNE)	1.551959	0.154683	10.03313	0.0000
CointEq(-1)	-0.606351	0.127135	-4.769344	0.0001
Long Run Coefficients				
GNE	0.865177	0.052865	16.36565	0.0000
C	19.59222	7.999968	2.449037	0.0242
R-squared	0.858057	Mean dependent var		6.363478
Adjusted R-squared	0.851298	S.D. dependent var		20.70827
S.E. of regression	7.985506	Akaike info criterion		7.076075
Sum squared resid	1339.134	Schwarz criterion		7.174813
Log likelihood	-79.37486	Hannan-Quinn criter.		7.100907
Durbin-Watson stat	1.263027			

Source: EViews 12 output.

• **Interpretation of the results of the study:**

The results indicate a strong positive relationship between government spending and economic growth in Algeria during the studied period. It is evident that short-term changes in government spending directly affect economic growth. In other words, any increase in government spending will

lead to an increase in economic growth. Additionally, the long-term regression results show a statistically significant positive coefficient for government spending, reflecting that government spending is one of the main drivers of long-term economic growth.

The high value of the R-squared coefficient (0.858) indicates that the model has good explanatory power. Moreover, the negative and highly statistically significant coefficient for the error correction term (CointEq(-1)) suggests the presence of a long-term equilibrium relationship between the variables. In other words, any deviation from the equilibrium state in the previous period triggers a correction mechanism that works to return the variables to equilibrium in the current period.

4- Conclusion:

Based on the results, the study concluded that there is a significant positive relationship between government spending and economic growth in Algeria during the period from 1999 to 2022, which aligns with previous studies and economic theories that suggest a positive relationship between the two variables. This outcome can be attributed to the expansionary fiscal policies adopted by the Algerian government, which focused on increasing spending to stimulate economic growth by enhancing aggregate demand and encouraging economic activities. Financial resources were directed toward development programs aimed at economic diversification and reducing dependency on oil.

The main areas supported by government spending included agriculture, industry, infrastructure, health, education, and social welfare. Investments in infrastructure helped improve transportation and logistics, while spending on health and education enhanced services and reduced regional disparities. Moreover, government spending contributed to addressing social challenges such as poverty, unemployment, and housing, which helped improve living standards, create job opportunities, and reduce poverty.

Based on the study's results, it is recommended to focus on projects with high economic and social returns, reduce dependence on oil and gas by encouraging investment in sectors such as industry, tourism, and agriculture. It is also advisable to allocate part of the spending to support startups and small businesses in productive and agricultural sectors, and implement effective spending monitoring mechanisms with transparent information. Additionally, procedures should be simplified to attract private investments, increase spending on education and vocational training, and invest in infrastructure projects that support economic growth.

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