

THE IMPACT OF GOVERNMENT EXPENDITURE ON ECONOMIC GROWTH IN ALGERIA AN ECONOMETRIC STUDY FOR THE PERIOD (1990–2023)

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Abstract:

The study aimed to measure the impact of government expenditure on economic growth in Algeria for the period (1990–2023), using the Autoregressive Distributed Lag (ARDL) model. A set of independent variables was used, namely the logarithm of government expenditure, the logarithm of gross fixed capital formation, and the logarithm of domestic credit provided to the private sector, while the logarithm of gross domestic product was used as the dependent variable. The study concluded with several results, including the existence of a significant positive relationship between the logarithm of government expenditure and the logarithm of gross domestic product. It also found a significant positive relationship between the logarithm of gross fixed capital formation and the logarithm of gross domestic product, while the relationship between the logarithm of domestic credit provided to the private sector and the logarithm of gross domestic product was positive but not significant.

Keywords: Government expenditure, economic growth, Algeria.

Introduction:

Economic growth is considered a fundamental indicator reflecting the health of the national economy and its ability to achieve sustainable development. Growth is typically defined as an increase in the Gross Domestic Product (GDP) or the Gross National Product (GNP) over a specific period, indicating improvements in productivity and resource efficiency. Economic growth is influenced by multiple factors, including investment in capital, technological advancements, improved education, and the availability of natural resources. Growth serves as a key driver for improving living standards and increasing employment opportunities, as well as a measure of social and economic progress. However, growth should be seen as an objective that requires balancing with social justice, since unbalanced growth can exacerbate economic and social disparities. Therefore, there is a need to formulate effective economic policies that ensure a fair distribution of benefits and promote sustainability.

Government expenditure is an important strategic tool in managing the national economy, playing a central role in directing resources toward vital sectors and enhancing economic growth. Government expenditure is reflected in the spending undertaken by the state to provide public services such as education, health, and infrastructure, which are essential for developing productive capacities and increasing welfare levels. However, opinions vary regarding the effectiveness of this expenditure in promoting economic growth. Some experts believe that government investment in development projects can significantly stimulate economic activity and increase GDP. On the other hand, others indicate that excessive government expenditure may lead to negative effects such as inflation or fiscal deficits, which hinder long-term growth. Thus, the relationship between government expenditure and economic growth requires careful study that considers the specific economic and social context of each country. In Algeria's case, the economy relies heavily on oil revenues, making an understanding of the impact of government expenditure on growth crucial for achieving sustainable development.

A. Problem Statement:

In light of the discussion above and given the significant importance of government expenditure and its major role in contributing to economic growth in Algeria, this research paper seeks to answer the following central question:

To what extent does government expenditure affect economic growth in Algeria during the period (1990–2023)?

B. Hypotheses:

Based on the main problem statement, the following hypotheses can be formulated:

- There is a statistically significant relationship between government expenditure and economic growth in Algeria.
- There is a long-term relationship between government expenditure and economic growth in Algeria.
- The estimated model is statistically unacceptable due to the presence of one of the statistical problems.

C. Significance of the Study:

Studying the impact of government expenditure on economic growth is of great importance because it helps guide economic policies by supporting informed decision-making regarding resource allocation. Such studies also contribute to achieving sustainable development by designing strategies that enhance economic sustainability and welfare. In addition, they allow for evaluating the effectiveness of expenditure in achieving economic and social objectives.

D. Objectives of the Study:

The main objective of the study is to determine the impact of government expenditure on economic growth in Algeria during the period (1990–2023). This contributes to analyzing the relationship between different expenditure patterns and growth, helping identify the sectors that benefit most from investment. The study also aims to provide recommendations based on the results to improve the effectiveness of expenditure policies and enhance economic growth.

E. Methodology of the Study:

The study relies primarily on the descriptive and analytical methods by reviewing previous studies and the relationship between government expenditure and economic growth. In addition, it employs quantitative and inductive approaches to measure the impact of government expenditure on economic growth in Algeria by estimating the model adopted in the study and interpreting the results obtained.

I. Previous Studies:

There are several previous studies that addressed the topic of this research, among which are the following:

1. Study (Boufanesh, 2022):

The study aimed to measure the effect of government investment expenditure on economic growth in Algeria during the period (1980–2019) using the Autoregressive Distributed Lag (ARDL) model. A set of independent variables representing government investment expenditure was used, namely (government investment expenditure; government consumption expenditure; trade openness; domestic credit provided to the private sector; domestic savings). The dependent variable (economic growth) was represented by real GDP. The study concluded that there is no relationship between government investment expenditure and economic growth (Boufanesh, 2022, pp. 371–392).

2. Study (Diop, 2018):

The researcher attempted to measure the effect of government expenditure on economic growth in Syria for the period (1990–2010) using the ARDL model. The study relied on two independent variables (current government expenditure; capital government expenditure), in addition to GDP as the dependent variable. The study found a positive and significant effect of current government expenditure on GDP, while no significant effect was found between capital government expenditure and GDP (Diop, 2018, pp. 95–105).

3. Study (Al-Shammari & Al-Dakhil, 2019):

The study aimed to analyze and measure the effect of government expenditure on economic growth in the Kingdom of Saudi Arabia during the period (1985–2017) using the multiple linear regression model. The study relied on the independent variables (government expenditure; consumption expenditure; investment expenditure), in addition to GDP as the dependent variable. The study concluded that there is a significant positive relationship between government expenditure and investment expenditure with economic growth, while no significant relationship was found between consumption expenditure and economic growth (Al-Shammari & Al-Dakhil, 2019, pp. 1–18).

4. Study (Al-Digha, 2024):

The researchers examined the causal relationship between public expenditure and economic growth within the framework of Wagner's Law and Keynes' Hypothesis in Libya for the period (1980–2021), in both the short and long run, using the Granger causality and Toda–Yamamoto methodologies. The study found no causal relationship between the variables in the short run, while a causal relationship running from economic growth toward public expenditure existed in the long run (Al-Digha, 2024, pp. 23–35).

II. The Relationship Between Government Expenditure and Economic Growth:

Government expenditure is closely linked to fiscal policy and is considered one of the main tools used by governments to address contractionary and expansionary gaps in the economy. Fiscal policy relies on instruments such as government spending and taxation; government expenditure is increased and taxes are reduced under an expansionary fiscal policy, whereas spending is reduced and taxes are increased under a contractionary fiscal policy (Al-Humaidi & Al-Khalaf, 2009, pp. 264–265). On the other hand, classical economists believed that economic growth occurs automatically without government intervention, based on principles and assumptions asserting that economic equilibrium is always achieved at full employment of economic resources. However, the Great Depression proved that such automaticity relied upon by the market system is insufficient to maintain effective demand at the level required to achieve full employment (Maatouq, 2013, pp. 81–82).

Keynes, however, argued that effective demand is the main determinant of levels of employment, production, and national income (Al-Sudani, 1996, p. 25). The theory of the British economist John Maynard Keynes underscored the importance of government expenditure as a key component of effective aggregate demand. Increasing effective demand is considered a necessary condition for achieving optimal long-term growth rates, through the multiplier mechanism based on the unique advantages of public expenditure. Government expenditure is treated as an exogenous variable whose impact on national income illustrates a causal relationship extending from government spending to national income through its ability to generate new individual incomes and thus strengthen purchasing power (Tamar, 2021, p. 93). Keynes also placed great emphasis on investment demand in explaining economic fluctuations, arguing that the sensitivity of investment demand to market conditions is the main cause of economic instability. When prolonged recession occurs, economic activity deteriorates, requiring government intervention to halt this decline by increasing public expenditure directly to compensate for the drop in investment spending. Conversely, countermeasures are taken in cases of economic recovery. Thus, Keynes' ideas highlight the importance of government expenditure as an effective tool to enhance economic growth and stabilize markets (Al-Issa, 2001, p. 228).

With the significant expansion of the role and size of the public sector after World War II, various theories emerged to explain this role, addressing its economic, political, institutional, and international dimensions. The German economist Adolph Wagner referred to this phenomenon as the "Law of Increasing State Activity," pointing to the long-term tendency for government activities to grow relative to overall economic activity. Wagner explained that during industrialization, a country's real per capita share of public spending increases as part of the overall rise in total expenditure (Masroor, 2014, p. 80). Wagner's Law also states that long-term economic growth leads to increased

government expenditure, with public spending seen as an endogenous factor rather than a primary engine of national income growth. This means that as real income rises, there is a long-term tendency for the share of public expenditure to increase relative to national income. In summary, Wagner's Law suggests that government spending grows at a faster rate than national income, implying that as national income increases, the volume of government expenditure rises to meet the expanding social and administrative functions of the state (Gartchie & Addo, 2019, p. 2).

III. Econometric Framework:

In this section, we attempt to conduct an econometric study of the impact of government expenditure on economic growth in Algeria for the period (1990–2023), in order to determine the extent of government spending's contribution to economic growth using the Autoregressive Distributed Lag (ARDL) model, as follows:

1. Study Variables and Data Sources:

To examine the impact of government expenditure on economic growth in Algeria and answer the research problem, annual time series data consisting of 34 observations for the period (1990–2023) were used. The variables and study period were selected based on previous studies and data availability. All data were obtained from the World Bank Database for the following variables (World Bank Database, 2024):

- ❖ Log GDP: Logarithm of Gross Domestic Product (constant 2010 US dollars);
- ❖ Log GE: Logarithm of Government Expenditure (% of GDP);
- ❖ Log CAF: Logarithm of Gross Fixed Capital Formation (% of GDP);
- ❖ Log DCP: Logarithm of Domestic Credit Provided to the Private Sector (% of GDP).

2. Stationarity Test:

Table 1 presents the results of the Augmented Dickey–Fuller (ADF) stationarity test, which shows that all variables are non-stationary at the level and become stationary at the first difference. Therefore, they are integrated of order 1, I(1).

Table 1: Summary of the ADF Test for Variable Stationarity

Table 1: Summary of the ADF Test for Variable Stationarity							
variable	at the level		at the first difference		at the second difference		decision
	cutting	cutting and direction	cutting	cutting and direction	cutting	cutting and direction	
	t-statistic						
	Prob						
Log GDP	-0.01 0.950	-1.62 0.762	-4.25 20.00	-4.18 0.012	/	/	stationary at the first difference
Log GE	-2.08 0.252	-2.19 0.476	-. 615 0.000	-5.51 0.000	/	/	stationary at the first difference
Log CAF	-0.93 0.761	-2.32 0.407	-4.94 0.000	-4.85 0.002	/	/	stationary at the first difference
Log DCP	-2.60 0.102	-4.81 0.002	-4.75 0.000	-5.05 0.001	/	/	stationary at the first difference

3. Lag Length Selection:

After conducting the ADF stationarity test, which showed that all variables are stationary at the first difference, it can be concluded that the most appropriate model for this study is the Autoregressive Distributed Lag (ARDL) model. One of the conditions for applying this model is that the study variables must be stationary either at level, at first difference, or a mixture of both.

Before performing the bounds test for the ARDL model, it is necessary to determine the optimal lag length for each variable, as shown in the following figure:

Table 01: Optimal Lag Length for the ARDL Model.

Model Selection Criteria Table						
Dependent Variable: LOGGDP						
Date: 10/08/24 Time: 00:06						
Sample: 1990 2023						
Included observations: 27						
Model	LogL	AIC*	BIC	HQ	Adj. R-sq	Specification
1	92.936496	-5.402703	-4.442824	-5.117281	0.996766	ARDL(4, 4, 4, 4)
117	84.093769	-5.340279	-4.764352	-5.169026	0.997094	ARDL(4, 0, 1, 3)
2	90.950043	-5.329633	-4.417748	-5.058482	0.996722	ARDL(4, 4, 4, 3)
97	83.581918	-5.302364	-4.726437	-5.131111	0.996982	ARDL(4, 1, 0, 3)
92	84.162063	-5.271264	-4.647342	-5.085739	0.996903	ARDL(4, 1, 1, 3)
116	84.119942	-5.268144	-4.644222	-5.082619	0.996893	ARDL(4, 0, 1, 4)
112	84.103130	-5.266899	-4.642977	-5.081374	0.996889	ARDL(4, 0, 2, 3)
72	84.001892	-5.259399	-4.635478	-5.073875	0.996866	ARDL(4, 2, 0, 3)
102	85.885359	-5.250767	-4.530858	-5.036701	0.996819	ARDL(4, 0, 4, 3)

The figure above shows that the ARDL (4,4,4,4) model is the appropriate model for estimation based on the determination of the optimal lag length.

4. Bounds Test:

To determine the existence of a cointegration relationship among the study variables, the Bounds Test is used. The results are presented in the following table:

Table 2: Bounds Test

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	3.229004	10%	2.37	3.2
k	3	5%	2.79	3.67
		2.5%	3.15	4.08

From the table above, the computed F-statistic value (F-statistic = 3.22) is greater than the upper bound at all different significance levels. Therefore, the alternative hypothesis stating the existence of cointegration is accepted, indicating the presence of a long-term relationship among the study variables.

5. Estimation of the ARDL Model:

After confirming the existence of cointegration among the study variables, it is necessary to estimate the long-run equilibrium relationship. The ARDL model is estimated for both the long run and the short run, as shown in the following table:

Table 3: Results of ARDL Model Estimation in the Long Run and the Short Run

ARDL Long Run Form and Bounds Test				
Dependent Variable: D(LOGGDP)				
Selected Model: ARDL(4, 4, 4)				
Case 2: Restricted Constant and No Trend				
Date: 10/08/24 Time: 00:07				
Sample: 1990 2023				
Included observations: 27				
Conditional Error Correction Regression				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.50550	4.200657	2.738978	0.0290
LOGGDP(-1)*	-0.457323	0.167616	-2.728393	0.0294
LOGGE(-1)	-0.314543	0.158198	-1.988290	0.0871
LOGCAF(-1)	0.435519	0.220455	1.975546	0.0888
LOGDCP(-1)	0.062241	0.043978	1.415293	0.1999
D(LOGGDP(-1))	0.153366	0.395674	0.387606	0.7098
D(LOGGDP(-2))	1.035870	0.403866	2.564886	0.0373
D(LOGGDP(-3))	0.708690	0.420527	1.685241	0.1358
D(LOGGE)	-0.007358	0.280787	-0.026204	0.9798
D(LOGGE(-1))	0.145171	0.234395	0.619344	0.5553
D(LOGGE(-2))	0.314763	0.234079	1.344688	0.2207
D(LOGGE(-3))	0.393221	0.220120	1.786398	0.1172
D(LOGCAF)	0.063394	0.226439	0.279963	0.7876
D(LOGCAF(-1))	-0.137964	0.247027	-0.558498	0.5939
D(LOGCAF(-2))	-0.265409	0.191952	-1.382685	0.2093
D(LOGCAF(-3))	-0.353883	0.184891	-1.914009	0.0972
D(LOGDCP)	0.019212	0.053407	0.359734	0.7297
D(LOGDCP(-1))	0.016030	0.043232	0.370787	0.7218
D(LOGDCP(-2))	0.042978	0.017720	2.425414	0.0457
D(LOGDCP(-3))	0.020635	0.019589	1.053400	0.3272
Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOGGE	-0.687791	0.198978	-3.456613	0.0106
LOGCAF	0.952324	0.278368	3.421095	0.0111
LOGDCP	0.136099	0.073233	1.858440	0.1055
C	25.15839	0.576384	43.64868	0.0000
EC = LOGGDP - (-0.6878*LOGGE + 0.9523*LOGCAF + 0.1361*LOGDCP + 25.1584)				

From the long-run equation of the ARDL model, the following can be observed:

- The value of the estimated parameter for the constant term indicates that when the independent variable is zero, the value is approximately 25.15, and it is significant because $P < 0.05$.
- There is a significant inverse relationship between government expenditure and GDP, as indicated by the negative sign of the government expenditure coefficient, in addition to $P < 0.05$. This result suggests that an increase in government expenditure does not necessarily contribute to promoting economic growth and may reflect poor resource management or inefficiency in directing spending toward productive projects. This finding may be consistent with economic theories suggesting that excessive government expenditure can lead to increased fiscal deficits or inflation, which negatively affect growth.
- There is a significant positive relationship between gross fixed capital formation and GDP, as shown by the positive sign of the gross fixed capital formation coefficient, in addition to $P < 0.05$. This result indicates that investment in fixed capital such as infrastructure and equipment contributes substantially to increasing productivity and economic growth. This finding aligns with economic theory asserting that investments play a vital role in stimulating growth through improved efficiency and increased production capacity.
- There is a positive but insignificant relationship between domestic credit to the private sector and GDP, as indicated by the positive sign of the credit coefficient and $P > 0.05$. This result suggests that domestic credit does not have a notable effect on economic growth, which may be attributed to several factors such as: weaknesses in the financial sector, inefficient use of loans in productive investments, or structural and regulatory constraints affecting credit effectiveness. This result may contradict economic theories that assume credit should stimulate growth, implying the presence of barriers that limit its impact.

6. Diagnostic Tests:

- Appendix 2 refers to the normality test of residuals, where the Jarque–Bera statistic ($J-B = 0.774$) is greater than 0.05, leading to acceptance of the alternative hypothesis indicating that the model residuals follow a normal distribution.
- Appendix 3 refers to the Breusch–Godfrey Serial Correlation LM Test for autocorrelation. The statistic ($F = 2.31$) and its corresponding probability are greater than 0.05, indicating the absence of autocorrelation among the residuals.
- Appendix 4 refers to the ARCH Test for heteroskedasticity, where the statistic ($F = 2.45$) and the corresponding probability are greater than 0.05, indicating that the error term is homoscedastic.
- Appendix 5 refers to the structural stability test of the model, which shows that the model is stable and consistent.

IV. Conclusion:

In this study, we attempted to measure the relationship between government expenditure and economic growth in Algeria during the period 1990–2023, in order to answer the main research question: “To what extent does government expenditure affect economic growth in Algeria during the period (1990–2023)?” This was achieved through reviewing various previous studies, examining the theoretical relationship between government expenditure and economic growth, and applying the Autoregressive Distributed Lag (ARDL) model, which was found to be the most appropriate model for this study.

The study reached several key findings, the most important of which are:

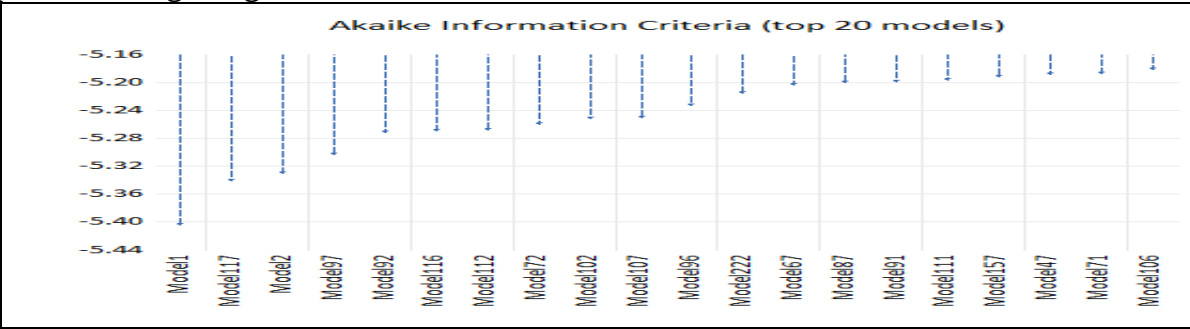
- The existence of a long-run relationship between government expenditure and economic growth in Algeria during the period (1990–2023).
- A significant inverse relationship between government expenditure and GDP, indicated by the negative sign of the government expenditure coefficient and $P < 0.05$.
- A significant positive relationship between gross fixed capital formation and GDP, reflected by the positive sign of its coefficient and $P < 0.05$.
- A positive but insignificant relationship between domestic credit to the private sector and GDP, shown by the positive coefficient and $P > 0.05$.
- Diagnostic tests confirmed that the estimated model is free from all statistical problems.

Recommendations:

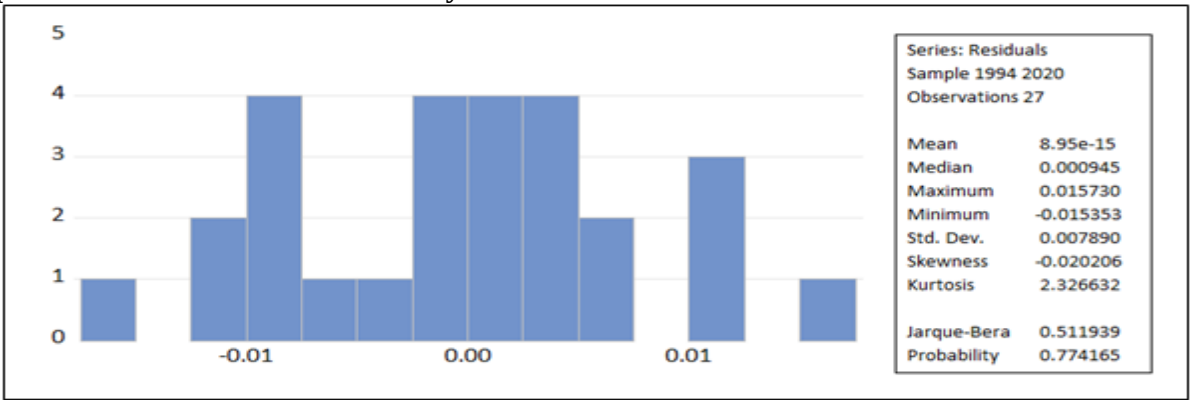
Improving government expenditure in Algeria requires comprehensive strategies focused on efficiency, transparency, and sustainable development, thereby enhancing the country’s ability to achieve long-term economic growth. Accordingly, the following recommendations can be proposed:

- **Enhancing expenditure efficiency and transparency:** Direct resources toward high-return projects, increase transparency, and combat corruption to ensure effective use of public funds.
- **Redirecting expenditure and stimulating the private sector:** Support sustainable development projects such as renewable energy and create a favorable environment for **attracting private investment**.
- **Developing the financial system and diversifying the economy:** Improve the efficiency of domestic credit to increase productive investments and reduce reliance on the oil sector by developing other industries.
- **Conducting analytical studies and strengthening education and training:** Carry out periodic evaluations of expenditure policies and their impact on growth, and invest in workforce skills to improve productivity.

II. Appendices:
Appendix 1: Lag Length Selection



Appendix 2: Results of the Normality Test



Appendix 3: Results of the Autocorrelation Test

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

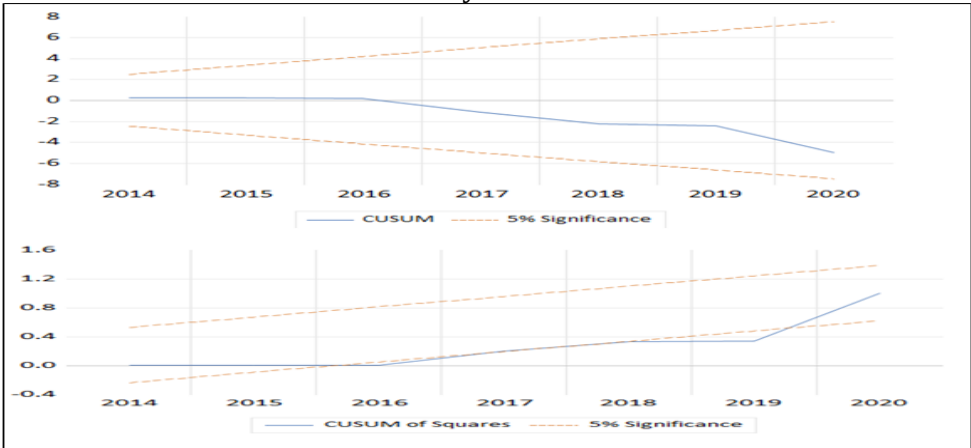
F-statistic	2.319548	Prob. F(2,5)	0.1938
Obs*R-squared	12.99454	Prob. Chi-Square(2)	0.0015

Appendix 4: Results of the Heteroskedasticity Test

Heteroskedasticity Test: ARCH

F-statistic	2.457025	Prob. F(1,24)	0.1301
Obs*R-squared	2.414581	Prob. Chi-Square(1)	0.1202

Appendix 5: Results of the Structural Stability Test



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