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# The Impact of Central Bank Independence on Economic Growth in Algeria 1990 – 2021

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**Abstract** :

This study aims to measure the impact of central bank independence on economic growth in Algeria from 1990 to 2021 using the ARDL model.

- Long-term Impact: Central bank independence is positively correlated with GDP growth, indicating that increased autonomy supports economic stability and growth.
- Short-term Dynamics: The ARDL model confirms that central bank policies significantly affect GDP growth in the short term, although this impact varies with economic conditions.

**Keywords**: Monetary Policy, Central Bank Independence, Inflation, Economic Growth, Gross Domestic Product (GDP).
**Jel Classification Codes**: E52, E58, E31, O40, E01 .

## INTRODUCTION

The independence of central banks has emerged as a critical subject of interest for researchers and policymakers globally due to its profound impact on economic performance and financial stability. In the context of economic development , and through statistics In Algeria, there has recently been increased interest in the independence of the central bank and its effects on economic growth. has gained significant relevance, particularly with the adoption of policies aimed at bolstering financial stability and fostering sustainable growth.

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Since the early 1990s, Algeria has undergone substantial shifts in its economic strategies, including reforms designed to enhance central bank autonomy . These reforms aimed to achieve monetary stability and address evolving economic challenges. This study focuses on the period from 1990 to 2021, characterized by major political and economic transformations that have profoundly affected the Algerian economy.

In this research, we will shed light on the relationship between the independence of the central bank and economic growth in Algeria, according to a quantitative study. and employing various econometric models, including ARDL. the study seeks to enhance our understanding of how independent monetary policies influence economic growth.

Through this analysis, we aim to address critical questions about the impact of central bank independence on key economic indicators and explore how strengthening this independence might contribute to achieving sustainable and stable economic growth.

## 1. Previous Studies :

### 2-1 Study by Ding & Vitenu-Sackey :

The article titled:**Central Bank Independence and Economic Growth of Ghana , what inflation and GDP per capita growth rates matter? (Ding & Vitenu-Sackey, 2021)** During the period 1996 to 2017, the study focused on Ghana. In the econometric study, several analytical techniques were used to assess the relationship between central bank independence and economic growth.

**Results of the study**:

- There is a positive effect according to a direct relationship between the independence of the central bank and economic growth, especially when inflation rates are below 26.1%.
- Statistical Significance at Higher Inflation Rates**: The results indicated that the relationship remains statistically significant even at higher inflation rates, highlighting the importance of maintaining a stable economic environment.

### 1.2 Study by "Cobus Vermeulen":

The **"Autoregressive Distributed Lag (ARDL)"** model was applied to assess the influence of **"Central Bank Independence (CBI)"** on both inflation and money growth. In addition, **"Granger causality tests"** This data was used to explore the relationship between the variables, and the results of the study, as stated in the article :**"Central Bank Independence, Inflation, and Money Growth: Evidence from South Africa"(Vermeulen, 2024)** , highlight several key insights:

- **Negative Relationship between Central Bank Independence and Inflation**: The analysis revealed a statistically significant negative correlation between **"CBI"** and inflation rates in South Africa. This suggests that greater central bank independence correlates with lower inflation rates, signaling increased central bank credibility in maintaining price stability.
- **Negative Relationship between Central Bank Independence and Money Growth**: Similarly, the findings indicated a negative connection between central bank independence and the growth of money supply. This implies

that a more independent central bank leads to slower rates of money growth, reflecting tighter control over monetary policy.

- **Independence as a Commitment Mechanism**: Central bank independence functions as a commitment mechanism that bolsters the institution's credibility and contributes to stabilizing inflation expectations, Which contributes to reducing the effects of inflation.
- The study concluded the importance of independence in targeting inflation, as the legal independence of the central bank enhances its ability to achieve price stability, making it an effective tool component of a successful inflation-targeting framework.

Overall, the findings emphasize the importance of central bank independence in enhancing price stability, reducing inflation, and controlling money growth in the South African economy.

### 2-3 **Study by Victoria Dudchenko**

The article titled " Role of Central Bank Independence in Banking. and Financial Stability Ensuring" **(Dudchenko, 2020)** concluded with the following results:

- Number of Countries: The study was conducted on a sample of 20 Countries can be categorized into two groups: **developed countries** (including nations like the **U.S.A, Canada,** and the **U.K**)... etc, and developing countries (such as Ukraine, Latvia, Lithuania, etc.).
- Type of Econometric Study: The research employed various panel regression models to assess the effect of **"Central Bank Independence"** on banking stability, which was quantified using the **Z-score index**. Panel data were used for the period from 1991 to 2012.

**Study Results:**

- The results of the study concluded that "C.B.I " has a positive impact and statistically significant effect on banking stability in developed countries., while it did not have a notable impact in developing countries.
- Importance of Objectives: In developing countries, it was important to prioritize The objectives of the central bank were emphasized, whereas in developed countries, the emphasis was placed on the independence of monetary policy.
- Practical Conclusions: The findings support There is a necessity to strengthen **" C.B.I "** as a strategy to enhance the stability of the banking and financial system, while considering the distinctions between developed and developing countries.

Thus, the study provides valuable insights into the relationship between **C.B.I** and financial system stability, emphasizing the differences between various countries.

### 2-4 **Study by Irina-Raluca Badea**

**" C.B.I and its impact on the macroeconomic performance, Evidence from Romania before and after cris " (Badea, 2018)** ; This study conducted by **Irina-**

**Raluca Badea** explores the subject of **"Central Bank Independence (CBI)"** and its effects on economic performance, with a particular emphasis on the case of Romania before and after the economic crisis.

- Type of Econometric Method Used: The study employed Panel Data Models to evaluate the influence of **" C.B.I "** on economic performance.
- **" C.B.I "** is regarded as a fundamental element for the effectiveness of monetary policy, contributing to the creation of a reliable institution free from political influence, which reduces corruption and political interference.

**Study Results**:

- Slight Positive Correlation with Economic Growth: The results indicate a slight positive correlation between economic growth and **C.B.I**.
- **Mixed Relationship with Inflation**: The connection between **" C.B.I "** and inflation was not consistently negative, contrary to expectations.

The study aims to provide insights into how **C.B.I** affects financial stability and economic performance in a dynamic and changing context.

2-5 **Study by Athina Zervoyianni, Athanasios Anastasiou, Andreas Anastasiou**:

Title of the Study: "**Does C.B.I Really Matter? , Re-assesing the Role of the Independence of Monetary Policymakers in Macroeconomic Outcomes**" **(Zervoyianni, Anastasiou, & Anastasiou, 2012)**

- Econometric Methods Used: The study used standard regression methods considering White-heteroskedasticity-robust standard errors and Bayesian MCMC estimation methods.
- The study examines the impact of C.B.I on macroeconomic outcomes such as inflation, employment growth, and output volatility. The findings suggest that central bank independence may not have a significantly positive impact on economic performance when controlling for other relevant factors.

**Study Results**:

- **Impact on Inflation**: The findings suggest that **"C.B.I"** correlates with reduced inflation rates, but the impact is weak compared to other factors such as the quality of public institutions.
- Employment Growth: Central bank independence did not show a positive impact on employment growth after controlling for other variables.
- Output Volatility: The results suggest that central bank independence might lead to less stable output in the short term in the face of real shocks.

2-6 **Study by Jalal Qanas and Malcolm Sawyer** :

- Title of the Study: " **C.B.I** and the Political Economy of Monetary Policy" **(Qanas & Sawyer, 2023)**
- The study utilized a range of literature and theoretical models related to central bank independence, along with an analysis of various countries' experiences with inflation targeting policies.
- The study focuses on the impact of central bank independence on monetary policy, with an emphasis on the effectiveness of "inflation targeting,""
- the discussion highlights the skepticism surrounding its efficacy and examines evidence indicating that its performance between countries

adopting inflation targeting and those that do not may not differ significantly.

**Study Results**:

- Economic Performance: The findings indicate that central bank independence does not necessarily lead to improved economic performance as expected.
    - Effectiveness of Inflation Targeting: The study highlights that there is a need for further research to understand the relationship between central bank independence and monetary policies, and its effect on economic stability.
- The findings indicate that " **C.B.I** " may not consistently lead to improved economic outcomes, which indicates the complexity of the relationship between central bank policies and economic performance.

### 3. The Principle of C.B.I:

**C.B.I** denotes the central bank's autonomy from political pressures in managing its functions. It encompasses the bank's ability to make decisions and implement measures related to monetary policy freely and without interference . **(Casu, Girardone, & molyneux, 2022, p. 170)**

Central bank independence is not an end in itself, but rather a tool to protect monetary stability from the risks of political interference in the short run. Accordingly, central bank decisions should be subject to political scrutiny – not on a daily basis but at regular intervals. If inflation targeting is a system of discretion, accountability provides a means to ensure that discretion is used within specified constraints and for specified objectives. **(Dincer & Yuksel, 2020, p. 48)**

- Most studies examine two primary dimensions of C.B.I : Grier, Masciandaro, and Tabellini (1991) defined it as follows:

1. **Political Independence**: This dimension encompasses institutional features that protect the central bank from political influence when establishing its policy objectives.

**2. Economic Independence**: This aspect pertains to the factors that enable the C.B to pursue its monetary policy goals without restrictions.. **(Darlauf & Blume, 2010)**

Debelle and Fischer (1994) They also identified two dimensions of central bank independence:

- **Objective independence:** This shows the ability of the central bank to set its policy objectives without direct government influence.
- **Instrument Independence**: This denotes the central bank's capacity to utilize monetary policy tools to achieve its goals **(CBN, 2019, p. 47)**

### 2. Measuring Central Bank Independence

In this study conducted by Tobias Adrian, Ashraf Khan, and Lev Menand in 2024, entitled: "A New Measure of Central Bank Independence," they identified ten key indicators for measuring central bank independence. as illustrated in the following figure.

**Fig N= °1**: Measure of Central Bank Independence




**Source** : Lev Menand Tobias &Adrian & Ashraf Khan, A New Measure of Central Bank Independence, IMF Working Paper, **(2024, p. 13)**

## 4.Central Bank of Algeria: Major Legal Milestones and Reforms

**1.**Establishment (1962)

- Law No. 62-144: Approved by the Constituent Assembly on December 13, 1962.
- Purpose: Creation and definition of the central bank's statute.
- Amendments: Made during the 1970s and early 1980s to adapt to evolving needs.

2. Initial Reforms (1986)
   - Law No. 86-12: Dated August 19, 1986, concerning the banking system.
   - Objective: Comprehensive reform of the Algerian banking system.
   - Outcome: Central bank regained authority over monetary and credit policy, and its relationship with the public treasury was revised.
   - Context: Developments were inadequate for the new social and economic environment marked by deep reforms.
3. Comprehensive Legal Framework (1990)
   - Law No. 90-10: Dated April 14, 1990, concerning money and credit.
   - It is considered the first legal text that comprehensively defined the Bank of Algeria and the Algerian banking system.
4. Subsequent Ordinances (2003, 2010)
   - Ordinance No. 03-11: Dated August 26, 2003, replacing Law No. 90-10.

- Ordinance No. 10-04: Dated August 26, 2010, amending and supplementing Ordinance No. 03-11.
- Independence: Granted the central bank, now called the Bank of Algeria, broad substantive and functional independence.
- Governance: Managed by the Governor, a Board of Directors, and supervised by two auditors.
    - Board Composition: Three Deputy Governors and three senior officials with expertise in economic and financial matters.
    - Appointments: Governor and auditors by presidential decree; other board members by executive decree.

5. Latest Reforms (2023)
    - Law No. 09-23: Dated June 21, 2023, replacing Ordinance No. 03-11.
    - Objective: Adapt legal and regulatory frameworks to respond to deep economic and financial changes and technological challenges.
    - Governance Enhancements: Strengthened governance of the Bank of Algeria, the Monetary and Banking Council, the Banking Committee, and financial institutions.
    - New Provisions: Emphasis on including new economic actors and improving the regulatory environment.

Monetary and Banking Law (2023)

- Law No. 23-09: Dated June 21, 2023.
- Scope: Regulatory mechanism governing the management and operation of the Bank of Algeria, defining its powers and operations.
- **Council and Committee**: The decree defined the structure and powers of the Monetary and Banking Council, and also specified in detail the responsibilities and powers of the Banking Committee.. **(B.A, 2024)**

## 3. ANALYSIS RESULT AND DISCUSSION

1. **Unit root test:**

**Table** 1. Unit root test results

UNIT ROOT TEST RESULTS TABLE (ADF)

Null Hypothesis: the variable has a unit root

At Level

| | | GDP | M2 | INF |
|---|---|---|---|---|
| With Constant | **t-Statistic** | -2.2135 | -4.4057 | -1.5658 |
| | **Prob.** | 0.2059 | 0.0015 | 0.4876 |
| With Constant & Trend | **t-Statistic** | n0<br>- 3.7962 | ***<br>- 5.2832 | n0<br>- 1.9002 |
| | **Prob.** | 0.0304 | 0.0009 | 0.6303 |
| Without Constant & Trend | **t-Statistic** | -1.1813 | -2.0897 | n0<br>-1.4939 |
| | **Prob.** | 0.2116 | 0.0370 | 0.1243 |

| | | At First Difference | | |
|---|---|---|---|---|
| | | **d(GDP)** | **d(M2)** | **d(INF)** |
| With Constant | **t-Statistic** | - 8.9543 | - 6.7203 | - 5.6900 |
| | **Prob.** | 0.0000 | 0.0000 | 0.0001 |
| With Constant & Trend | **t-Statistic** | - 9.0884 | - 6.5522 | - 5.6878 |
| | **Prob.** | 0.000 | 0.0000 | 0.0003 |
| Without Constant & Trend | **t-Statistic** | - 9.1481 | - 6.7936 | - 5.6577 |
| | **Prob.** | 0.0000 | 0.0000 | 0.0000 |

**Source**. Eviews 10 output

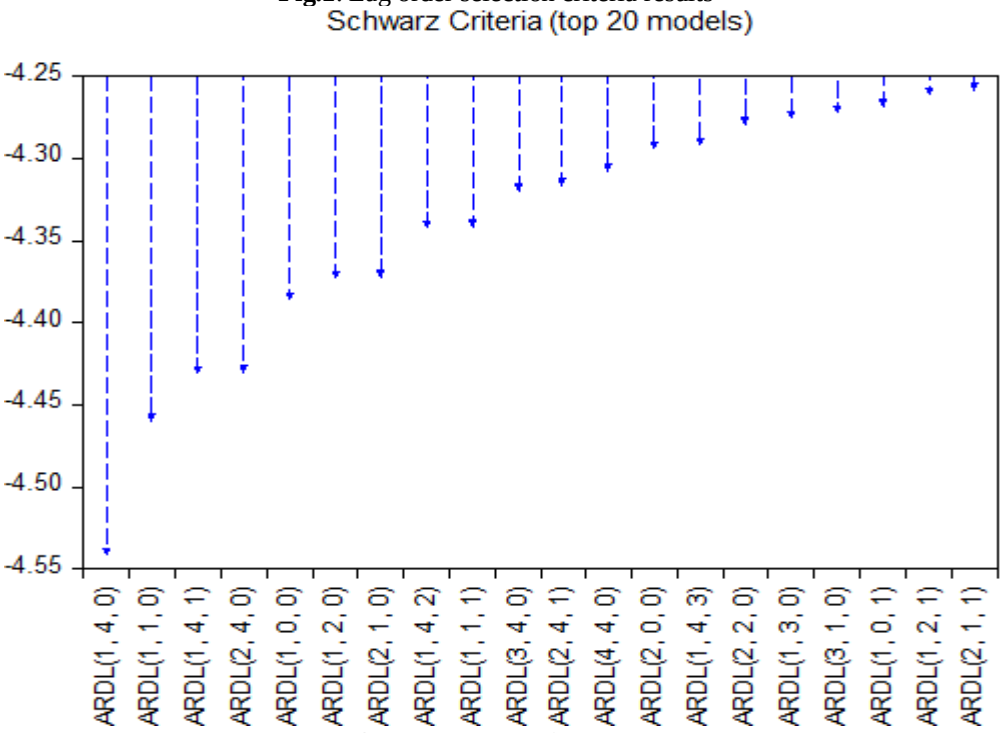
Based on the findings, it can be concluded that all variables are stationary at first deference I(1). Therefore, the ARDL method can be applied.

2. Lag length selection

For lag selection we depended on the value of akaike information criterion (AIC): (AKAIKE, 1974)

AIC= $\hat{\sigma}^2 \exp\left[2(\frac{p+q}{N})\right]$

**Fig.2**. Lag order selection criteria results




**Source**. Eviews 10 output

The results presented in **Fig1** suggest the use of **ARDL (1,4,0)**. To explore the long-term relationships and short-term dynamics among the variables, the ARDL model is formulated as follows:

$\Delta GDP_t = C_0 + \sum_{i=1}^{1} \propto_1 \Delta GDP_{t-1} + \sum_{i=1}^{4} \propto_2 \Delta M2_{t-} + \beta_1 GDP_{t-1} + \beta_2 M2_{t-1} + \beta_3 INF_{t-1} + \varepsilon_t$

where $\Delta$ is the difference operator; $C_0$ is the intercept; $\alpha 1$- $\alpha 2$ and $\beta 1$-$\beta 3$ are short- and long run coefficients, respectively; $\varepsilon$ is the error term.

3**. Bounds testing for cointegration** :

**Table 2**. Bound test for cointegration relationship

| **F-Bounds Test** | | **Null Hypothesis: No levels relationship** | | |
|---|---|---|---|---|
| **Test Statistic** | **Value** | **Signif .** | **1 (0)** | **1 (1)** |
| **F-statistic** | 9.73235 | 10% | 2.63 | 3.35 |
| **K_** | 2 | 5% | 3.1 | 3.87 |
| | | 2.5% | 3.55 | 4.380 |
| | | 1 % | 4.130 | 5 |

**Source**. Eviews 10 output

The long-run relationship between GDP and the independent variables is estimated due to the presence of cointegration between the specified variables.

The estimation process follows the **Akaike Information Criterion (AIC)**, leading to the selection of **ARDL (1,4,0)**.

4**. Long-run estimation**

After confirming the existence of a long-term cointegration relationship between the study variables, the long-term relationship factors described at 5% , 10% of significance in the table below:

**Table 3**. long-run estimates

**Levels Equation**
**Case 2: Restricted Constant and No Trend**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| M2 | 0.24755 | 0.06093 | 4.062945 | 0.0006 |
| INF | - 0.063155 | 0.051315 | - 1.230725 | 0.2327 |
| C | 0.003748 | 0.009758 | 0.384176 | 0.0000 |

EC = GDP - (0.2476*M2 -0.0632*INF -0.0037)

**Source**. Eviews 10 output

The findings regarding the long-term relationship between the dependent variable and the independent variables indicate that there is:

5. **Short-run estimation ;**

The **ECM (Error Correction Model)** reveals the short-term relationships among the study variables. The results of this estimation are presented in **Table 6**, where it is clear that all study variables are significant at the 5% level of significance.

**Table 4**. Results of short-run dynamic model

**ARDL Error Correction Regression**
**Dependent Variable: D(GDP)**
**Selected Model: ARDL(1, 4, 0)**
**Case 2: Restricted Constant and No Trend**
**Date: 08/01/24 Time: 12:24**
**Sample: 1990 2021**
**Included observations: 28**

**ECM Regression**
**Case 2: Restricted Constant and No Trend**

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| **D(M2)** | -0.013217 | 0.032868 | -0.402128 | 0.6919 |
| **D(M2(-1))** | -0.195009 | 0.048556 | -4.016185 | 0.0007 |
| **D(M2(-2))** | -0.144173 | 0.041487 | -3.475124 | 0.0024 |
| **D(M2(-3))** | -0.115901 | 0.032650 | -3.549744 | 0.0020 |
| **CointEq(-1)*** | -1.052930 | 0.157366 | -6.690953 | 0.0000 |

| | |
|---|---|
| **R-squared** 0.686643 | **Mean dependent var** 0.002000 |
| **Adjusted R-squared** 0.632146 | **S.D. dependent var** 0.028269 |
| **S.E. of regression** 0.017145 | **Akaike info criterion** -5.133769 |
| **Sum squared resid** 0.006761 | **Schwarz criterion** -4.895876 |
| **Log likelihood** 76.87277 | **Hannan-Quinn criter**. -5.061043 |
| **Durbin-Watson stat** 2.185910 | |

* p-value incompatible with t-Bounds distribution.

**Source**. Eviews 10 output

It is important to highlight that the **Error Correction Model (ECM)** records a negative and statistically significant value, specifically at **1.052930**, which is well below 1%. This result indicates that the dependent variable, on-call GDP, requires less than one year to correct short-term imbalances and return to its long-term equilibrium. Practically, this means that the deviation of on-call GDP from its balanced state in the previous period (t-1) will be corrected by **1.05%** in the current period (t). The **R-squared** value of **0.686** closely approaches the ideal figure, indicating that the variables in question account for approximately **68.6%** of the variations in on-call GDP.

6. **Diagnostic tests results**

To validate our findings, we performed several diagnostic tests. As presented in **Table 7**, our model exhibits no issues with serial correlation, heteroscedasticity, or functional form misspecification at the 5% significance level. Additionally, the **Jarque–Bera** statistic supports the normal distribution of our model. The results from the **Breusch-Godfrey LM test** further confirm these findings.

**Breusch-Godfrey Serial Correlation LM Test:**

| | | | |
|---|---|---|---|
| **F-statistic** 0.768016 | | **Prob. F(2,18)** | 0.4785 |
| **Obs*R-squared** 2.201517 | | **Prob. Chi-Square(2)** | 0.3326 |

**Breusch-Pagan (hetroscedasticity)**

**Heteroskedasticity Test: Breusch-Pagan-Godfrey**

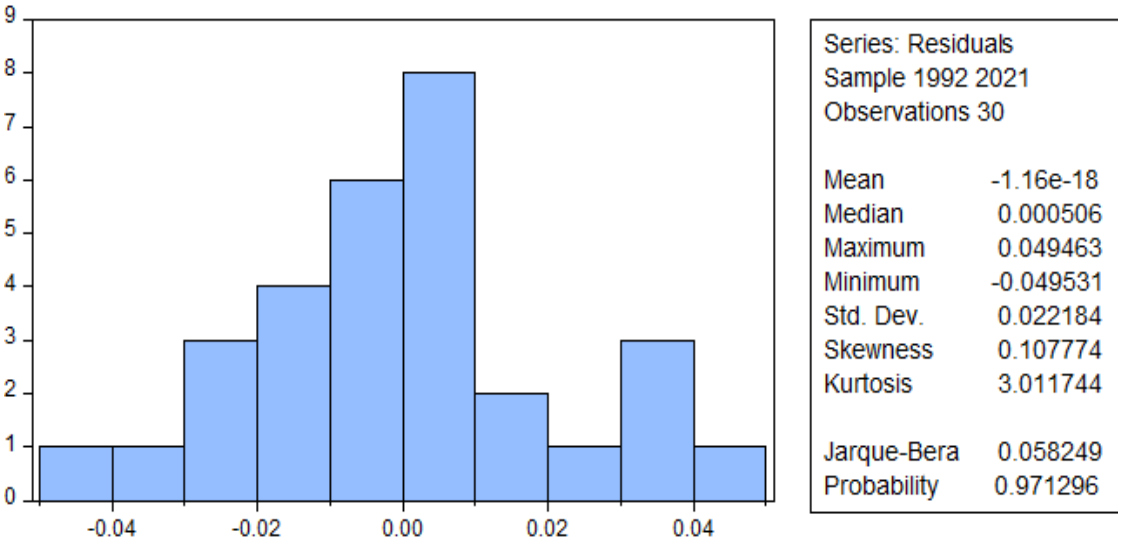
| | | | |
|---|---|---|---|
| **F-statistic** 0.934650 | | **Prob. F(7,20)** | 0.5021 |
| **Obs*R-squared** 6.901804 | | **Prob. Chi-Square(7)** | 0.4392 |
| **Scaled explained SS** 7.869079 | | **Prob. Chi-Square(7)** | 0.3443 |

**Arch (hetroscedasticity)**

**Heteroskedasticity Test: ARCH**

| | | | |
|---|---|---|---|
| **F-statistic** 0.029650 | | **Prob. F(1.25)** | 0.8647 |
| **Obs*R-squared** 0.031984 | | **Prob. Chi-Square(1)** | 0.8581 |

**Jarque-Bera (normality)**




**Source**. Eviews 10 output

Furthermore, the stability of the model is confirmed by the results shown in **Figures 2 and 3**, which illustrate the **CUSUM** and **CUSUMSQ** plots, respectively.

Both plots indicate that the model is stable, as the **CUSUM** lines remain well within the critical boundaries at the 5% significance level.

**Fig.3**. Plots of CUSUM

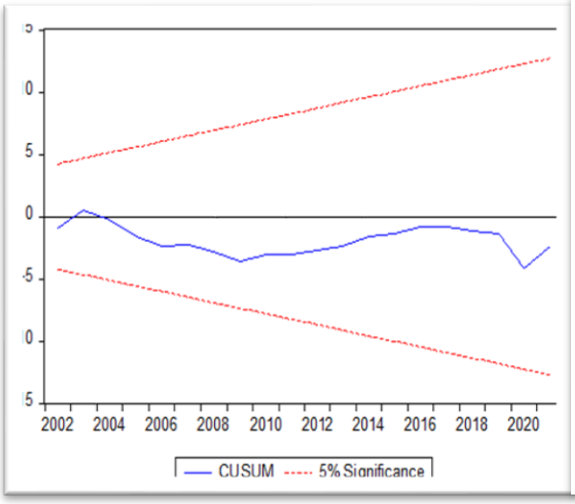
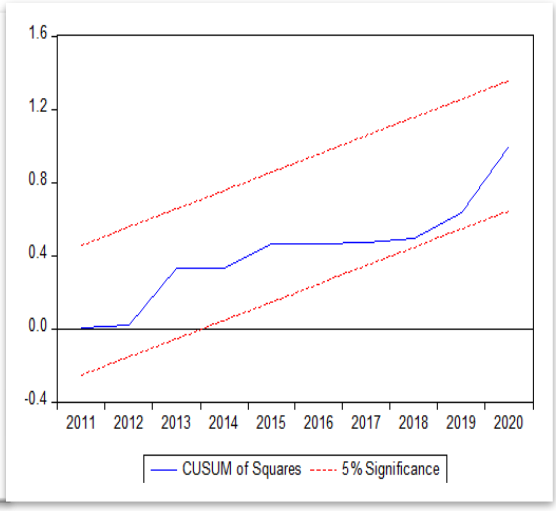



**Fig.4**. CUSUM of squares




**Source**. Eviews 10 output

## CONCLUSION :

This research aimed to explore the impact of central bank independence on economic growth in Algeria from 1990 to 2021, utilizing an econometric approach with the ARDL model.

- - The ARDL model was used to assess the long- and short-term dynamics between the central bank independence index and economic growth, and the results revealed a direct relationship between the C.B.I indicators and economic growth..
- The analysis revealed that higher levels of central bank independence, as indicated by a lower inflation rate, positively correlate with economic growth. This suggests that a more independent central bank, which maintains lower inflation, contributes to a more stable economic environment conducive to growth.
- The study also found that changes in M2 monetary issuance have a measurable impact on economic growth. An increase in M2, which reflects higher monetary control, was associated with varying degrees of impact on GDP, highlighting the role of monetary policy in influencing economic performance.
- The analysis of GDP in Algeria shows that economic growth is affected by the independence of the central bank.

- The results confirm that effective central bank policies, characterized by independence and control of inflation, are of great importance to promote sustainable economic growth.

**Recommendations**

1. Enhancing Central Bank Independence: To foster economic stability and growth, it is recommended that Algeria continue to strengthen the independence of its central bank. This includes ensuring that monetary policy decisions are made free from political interference and focused on maintaining low and stable inflation.
2. Monitoring Monetary Issuance: Effective management of M2 monetary issuance should be prioritized to avoid inflationary pressures while supporting economic growth. Policymakers need to strike a balance between monetary expansion and inflation control.
3. Continuous Evaluation: Ongoing evaluation of the impact of central bank independence on economic growth should be conducted to refine policies and adapt to changing economic conditions.
4. Policy Integration: Integrate findings from this research into broader economic policy frameworks to enhance the effectiveness of central bank policies and contribute to long-term economic stability and growth.

*Bibliographie*

1. *Casu, b., Girardone, c., & molyneux, p. (2022). Introduction to Banking. Pearson education limited.*
2. *CBN. (2019). Monetary Policy Review. Abuja ; Nigeria: Central Bank of Nigeria.*
3. *Darlauf, S., & Blume, L. (2010). Monetary Economics. Macmillan Puplishers Ltd.*
4. *Dincer, H., & Yuksel, S. (2020). Monetary Policies and Independence of the Central Banks in E7 Countries. USA: IGI Global.*