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AN ECONOMETRIC STUDY ON THE IMPACT OF FINANCIAL INCLUSION ON ECONOMIC GROWTH IN ALGERIA DURING THE PERIOD 2004–2024

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Abstract:
This study explores the relationship between financial inclusion indicators and economic growth in Algeria from 2004–2024. It employs an econometric approach, specifically the Autoregressive Distributed Lag (ARDL) model, to examine long- and short-term dynamics. Financial inclusion is measured using two indicators: the number of commercial bank branches and the number of automated teller machines (ATMs). Economic growth is measured by Gross Domestic Product (GDP). The findings indicate a long-term equilibrium relationship between financial inclusion indicators and economic growth in Algeria. Furthermore, the results show that ATMs positively affect economic growth, whereas commercial bank branches have a negative impact. Diagnostic tests confirm the model's validity and stability.

Keywords: Financial inclusion, economic growth, Algeria, ARDL model, automated teller machines (ATMs), commercial bank branches.

Literature review:
Economic growth is a strategic purpose and a fundamental goal for nations because it is pivotal to improving living standards and enhancing social well-being. Consequently, countries focus on fostering the economic and institutional conditions needed to boost growth rates and continually seek ways to drive economic development. In this context, financial inclusion emerges as a cornerstone of economic development; it enables individuals and businesses to access a diverse range of financial services, strengthening their investment capacity and financial planning efficiency and ultimately fueling economic growth. Furthermore, financial inclusion improves the financial system's overall efficiency by expanding its customer base and facilitating financing, which contributes to more effective allocation of financial resources in the economy.
Financial inclusion also narrows the financial exclusion gap by integrating low-income segments and remote regions into the formal financial system.
However, realizing these benefits depends on the availability of appropriate, high-quality, and affordable financial services that sustain demand and effectively meet economic and social needs. In Algeria, financial inclusion is receiving significant attention, driven by efforts to develop the banking sector and expand access to financial services—notably by strengthening the bank branch network and providing modern payment methods and banking services. While these initiatives aim to improve access to financial services and support economic activity, their impact on economic growth warrants further study, especially given the diverse range of indicators used to measure financial inclusion.
Hence, the present research strives to answer a fundamental question:
To what extent does financial inclusion contribute to increasing Gross Domestic Product (GDP), thereby supporting economic growth in Algeria?
Accordingly, it is hypothesized that a long-term equilibrium relationship exists between indicators of financial inclusion and economic growth in Algeria. Beyond this core question, the paper seeks to demonstrate the role of

financial inclusion in ensuring that all segments of society, including those currently excluded from formal financial services and products, can access such offerings at affordable costs. It also aims to clarify the relationship between financial inclusion and economic growth and to analyze the impact of automated teller machines (ATMs) and bank branches on economic growth.

The World Bank defines financial inclusion as the extent to which individuals and businesses can access useful, affordable financial products and services that meet their needs, such as transactions, payments, savings products, credit facilities, loans, and insurance, delivered responsibly and sustainably (World Bank,2022). Meanwhile, the Arab Monetary Fund defines financial inclusion as the access of all members of society to a range of formal financial services at affordable costs that cater to their needs, including: savings accounts for safeguarding funds and achieving financial security, payments for sending and receiving money easily and efficiently, borrowing to finance personal or business needs, and insurance to protect themselves and their assets against risks (AMF,2021). The Consultative Group to Assist the Poor (CGAP) defines financial inclusion as a state in which all working-age adults have access to credit, savings, payment, and insurance services provided by formal financial institutions (CGAP,2011). Effective financial inclusion means delivering these services to clients in a profitable, responsible, and affordable way, while ensuring the sustainability of the institutions that provide them. This expands access for those otherwise excluded or underserved, offering a formal alternative to the informal options currently available. In Algeria, the Bank of Algeria defines financial inclusion as providing and using a full range of financial services, including current and savings accounts, payment and transfer services, insurance, financing, and credit, across all segments of society, particularly marginalized groups, through formal channels. This also includes developing innovative, well-tailored financial services at competitive, reasonable prices. Overall, financial inclusion enables all individuals and institutions to access formal financial products and services, such as savings accounts, payment services, credit, and insurance, in a simple, accessible, and secure way. These services should be provided at reasonable costs and with quality that meets users' specific needs, delivered by financial institutions that operate sustainably and responsibly, ensuring even the most underserved groups are included (Bank of Algeria, 2022).

The concept of financial inclusion has evolved to encompass key dimensions, including access to financial services and the ability to use services provided by formal institutions. Determining access levels requires analyzing potential barriers to opening and using bank accounts, such as costs or the proximity of banking service points. For instance, it can be measured by the density of bank branches and ATMs and the availability of digital financial services. Another dimension is financial service usage, which reflects the extent to which customers use services offered by the banking sector; assessing it requires collecting data on usage regularity and frequency over a specific period. Ultimately, financial service quality reflects how important these services are to customers. Quality encompasses customer opinions and attitudes toward the financial services they seek. Addressing financial service quality is challenging and requires stakeholders to study, measure, and compare services, and to take evidence-based actions to improve the quality of services provided (Fellague et al.,2019).

The literature on this topic highlights several key purposes of financial inclusion. It expands access to financial services and products across all segments of society, supports self-employment initiatives, and drives economic growth. Financial inclusion empowers small and emerging enterprises to invest and expand, while also helping reduce poverty and promote social well-being. It also has a vital role in mobilizing savings and channeling them into investment, thereby fostering economic growth (Muschert et al., 2024). Additionally, its primary objectives include strengthening the stability of the global financial system and encouraging competitive advantages among global financial institutions. In this context, the United Nations has defined the goals of financial inclusion through three main pillars: facilitating household access to a comprehensive range of affordable and appropriate financial services, including savings deposits, payment and transfer services, credit, and insurance; ensuring access to institutions that operate with a high degree of professionalism and transparency, governed by clear rules and performance evaluation standards; and fostering competition among institutions, which provides customers with a wider array of choices and reduces the costs of financial products and services (Khellafue et al., 2026).

On the other hand, advancing financial inclusion requires establishing fundamentals that enable it to reach all components of society (Saidi, 2023). Developing a robust financial infrastructure is a key pillar for creating an environment conducive to financial inclusion. Consumer protection includes measures that minimize the risks customers face when interacting with financial institutions to access financial services, all within a comprehensive

framework of disclosure and transparency. This also involves developing financial products and services that meet the full range of customer needs, facilitate access for individuals and businesses, ensure prompt responses to customer requests, and make services easily accessible in ways tailored to specific requirements. Similarly, promoting financial literacy raises educational levels; this includes evaluating and measuring the success of such initiatives while ensuring involvement from government entities, the private sector, and other relevant stakeholders. The ultimate goal is to foster an integrated financial system that builds awareness across all segments of society.

The World Bank identifies five components as the cornerstone of financial inclusion research. Use of bank accounts: This refers to the share of adults who hold an account at formal institutions such as banks, post offices, or microfinance institutions for personal or business purposes. It also includes depositing and withdrawing funds (e.g., via ATMs or bank branches). Financial services penetration is measured by the number of deposit accounts and depositors per 1,000 adults. Savings: This covers adults who utilize formal financial institutions (such as banks or post offices) for savings, as well as those who save through informal savings mechanisms or other alternative methods. Savings-related access is gauged by indicators such as the number of bank branches and ATMs per 100,000 adults, which reflects the geographical availability of financial services. Insurance: This includes personal insurance coverage for adults, as well as insurance for farmers and fishermen to protect their productive assets against climate-related risks and natural disasters. Loans: This refers to the proportion of adults who have obtained loans from formal or informal financial institutions, including those who have borrowed from traditional sources or from family and friends and is assessed through specific indicators. Two key indicators are the number of loan accounts per 1,000 people at banks and the number of borrowers per 1,000 adults. Payments: this refers to the proportion of adults who have used a formal account to receive wages or government payments, or to make financial transfers to individuals in various locations over the past year. The widespread use of these services indicates how effectively they meet and align with customer needs and expectations (Kaddour,2023).

In addition, Financial inclusion influences economic growth through several channels (Hadjila,2026): The savings and investment channel, which mobilizes small-scale savings and channels them into productive investments; the credit and project finance channel, which facilitates financing for small and medium-sized enterprises (SMEs), thereby stimulating resource allocation; the efficiency and productivity channel, which reduces transaction costs and information asymmetry, leading to improved resource allocation; and the financial stability channel, which broadens the financial base and diversifies deposits, thereby reducing reliance on informal finance and mitigating systemic risks. Furthermore, the economic empowerment and aggregate demand channel integrates marginalized groups, boosting consumption and human capital investment, which in turn expands aggregate demand. Finally, the digitalization and financial innovation channel accelerates transactions and lowers costs through digital financial services, increasing the velocity of money and fostering innovation.

Hafsi and Bounabou (2022) examined the impact of financial inclusion on Algeria's economic growth from 2004–2019. The study used real GDP as a proxy for economic growth. Financial inclusion was measured using two indicators: the number of commercial bank branches per 1,000 adults and the number of commercial bank borrowers per 1,000 adults. The researchers employed an Autoregressive Distributed Lag (ARDL) model. The results revealed a long-term equilibrium relationship between financial inclusion and economic growth, indicating that increases in the number of commercial bank branches and borrowers contribute to economic growth. The study concluded that expanding the bank branch network, enhancing financial literacy, and improving access to financial services for various segments of society are essential to support economic growth. Similarly, Bouatli (2023) aimed to measure the direct and indirect impact of financial inclusion on economic growth in Algeria from 2004–2019 using annual data. The study utilized real GDP as a proxy for economic growth, while financial inclusion was measured by the number of commercial bank branches and the number of automated teller machines (ATMs). Investment, government spending, the exchange rate, and inflation were incorporated as channels for indirect influence. The results revealed a positive direct impact of financial inclusion on economic growth in Algeria. Likewise, the study found that the indirect impact varies by transmission channel: it was positive through investment and government spending, but negative through the exchange rate and inflation.

Meanwhile, Al-Ghayesh (2023) aimed to measure the impact of financial inclusion on economic growth across 23 African countries from 2002–2020 using panel data. The study employed the PMG-ARDL model and the Cobb-

Douglas production function to analyze the relationship between financial inclusion and economic growth. The results indicated that weak financial infrastructure in most African countries studied limited the impact of financial inclusion on economic growth. Furthermore, the findings revealed that the effect of financial inclusion on economic growth depends on a country's level of financial development; a more advanced financial sector enhances the effectiveness of financial inclusion and its positive contribution to economic growth. Hadjila (2026) conducted a study to analyze the relationship between financial inclusion and economic growth in Algeria over a two-decade period. The study used a descriptive-analytical approach for the theoretical framework and an econometric approach—using an Autoregressive Distributed Lag (ARDL) model—to examine short- and long-term dynamics. GDP per capita served as the dependent variable, while the number of bank accounts was the primary independent variable. The results indicate a long-term cointegration relationship; however, economic growth remained fundamentally dependent on hydrocarbon revenues.
Also, while financial inclusion exerted a positive influence in the short term, this effect diminished and became statistically insignificant in the long term. This suggests that the expansion in bank account ownership has not translated into productive financing capable of supporting structural economic growth. Bouchouk and Chnikher (2024) aimed to measure the impact of financial inclusion on economic growth, comparing 80 developed and developing countries. The study used Sarma's methodology to construct a composite financial inclusion index and applied dynamic panel data analysis, specifically the System Generalized Method of Moments (System GMM), to examine short- and long-term effects. The results indicated that, in developed countries, financial inclusion had a significant negative impact in the short term and an insignificant positive impact in the long term. Conversely, in developing countries, it had a significant positive impact in the short term and an insignificant negative impact in the long term, reflecting the differing economic, social, and institutional conditions between the two groups. Saha et al. (2023) analyzed the impact of financial inclusion on economic growth across 104 developing countries from 2004 to 2019 and compared these findings with high-income countries. The study constructed an innovative composite index of financial inclusion comprising six fundamental dimensions. It used the System GMM econometric approach, chosen for its suitability for the dynamic nature of economic growth data and its ability to mitigate endogeneity. The findings concluded that financial inclusion is positively and significantly associated with economic growth exclusively in developing countries; this aligns with its role in expanding economic opportunities for low-income groups, a process accompanied by a decline in rates. Poverty and the reduction of income inequality.

Research method and findings:
This econometric model measures the impact of financial inclusion on economic growth in Algeria from 2004 to 2024. This study employs the Autoregressive Distributed Lag (ARDL) technique developed by Pesaran and Shin (1997, 1999) to analyze the relationship between the variables in Algeria.

Econometric Model

To study the impact of fluctuations in financial inclusion on economic growth in Algeria during the 2004–2024 period, drawing upon various previous studies, the econometric model is formulated as follows:
Where:
• LGDPt: Gross Domestic Product, serving as an indicator of economic growth.
• LCBKt: Commercial bank branches (per 100,000 adults), serving as an indicator of financial inclusion.
• LATMt: Automated Teller Machines (ATMs) (per 100,000 adults), serving as an indicator of financial inclusion.
• α: The constant term.
• β: The coefficients representing the impact of financial inclusion indicators on economic growth.
• εt: The stochastic (error) term.
The study will transform the variables using logarithms to reduce irregularities in the time series, thereby aligning them with a normal distribution.

The World Bank database serves as the data source for estimating the impact of financial inclusion on economic growth in Algeria, using annual data from 2004–2024.

Stationarity of Time Series:

Table 1 presents the unit root test results, specifically the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests, applied to the variables in logarithmic form. The tests were conducted at both the level and the first-difference stages across three model specifications: (1) including both a deterministic trend and a constant term; (2) including a constant term but excluding a deterministic trend; and (3) excluding both a deterministic trend and a constant term. The test results are detailed in the following table:

Table 1: Results of the Augmented Dickey-Fuller and Phillips-Perron Tests

P.P		ADF		variables	
Tt	Tc	Tt	Tc		
-3.65	-2.05	-3.65	-1.98	Model 6	**LGDP**
3.02-	-1.32	3.02-	-1.32	Model 5	
-1.95	5.07	-1.95	5.37	Model 4	
-3.65	-1.14	-3.65	-1.38	Model 6	**LCBK**
3.02-	-2.31	3.02-	-2.31	Model 5	
-1.95	0.33	-1.95	0.36	Model 4	
-3.65	*-5.59	-3.65	-2.91	Model 6	**LATM**
3.02-	*-7.14	3.02-	*-4.99	Model 5	
-1.95	1.28	-1.95	2.04	Model 4	

Source: All outputs are elaborated by researchers using EViews 13.

***** Indicates the rejection of the unit root hypothesis at the 5% significance level.

The table above indicates that the time series for the variables (Gross Domestic Product, commercial bank branches, and automated teller machines) contain a unit root. This is because the test statistic values exceed the critical (tabulated) values, leading us to reject the null hypothesis that the series are stationary in their original form.

Since the series contain a unit root and are non-stationary, we will apply first-order differencing. The results are presented in the following table:

Table 2: Results of the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests at first-order differences.

P.P		ADF		Variables	
Tt	Tc	Tt	Tc		
-3.65	-3.67*	-3.65	-3.67*	Model 6	**DLGDP**
3.02-	-3.80*	3.02-	-3.80*	Model 5	
-1.95	-2.19*	-1.95	-2.19*	Model 4	
-3.65	-5.03*	-3.65	-4.90*	Model 6	**DLCBK**
3.02-	-3.54*	3.02-	-3.54*	Model 5	
-1.95	3.62*	-1.95	3.62*	Model 4	
-3.65	-8.94*	-3.65	-6.50*	Model 6	**DLATM**
3.02-	-7.14*	3.02-	-6.54*	Model 5	
-1.95	6.47*	-1.95	6.47*	Model 4	

* Indicates the rejection of the unit root hypothesis at the 5% significance level.
The table above shows that the time series for the variables (Gross Domestic Product, commercial bank branches, and automated teller machines) are stationary. This is because the test statistic values are lower than the critical values at the 10%, 5%, and 1% significance levels, leading to the rejection of the null hypothesis, which would otherwise imply the series are stationary only after first differencing. Consequently, it can be concluded that the variables are integrated of order one, denoted as I(1). Therefore, the bounds testing approach to cointegration, based on the Autoregressive Distributed Lag (ARDL) model, can be employed.

Cointegration Methodology Using the Bounds Testing Approach:
We will use the bounds testing approach for cointegration within an Autoregressive Distributed Lag (ARDL) model; this method is widely used.
As a preliminary step, the lag length for the unrestricted error correction model is determined using one of three criteria: The Akaike Information Criterion (AIC), the Schwarz Bayesian Criterion (SBC), or the Hannan-Quinn Criterion (HQ). The lag length with the lowest value is selected to identify the optimal specification.
Figure 1 presents the results of the optimal lag length selection. Based on these findings, the AIC criterion indicates that the optimal lag structure for the variables is ARDL (2, 1, 2).

Figure 1: AIC Criterion.

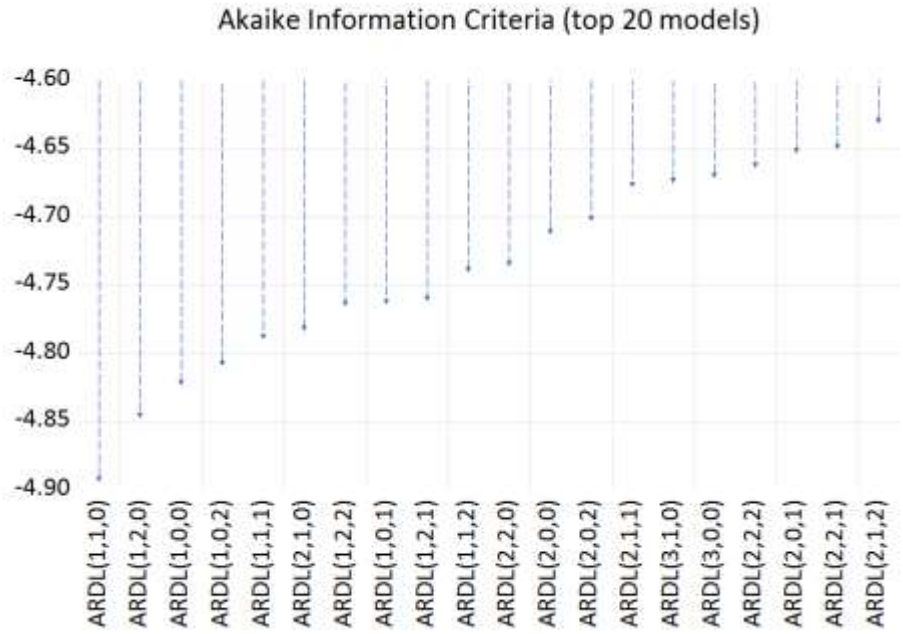


Table (03) presents the results of the bounds test, which is used to examine the existence of a long-term relationship between the gross domestic product (GDP), commercial bank branches, and automated teller machines (ATMs).

Table 3: Bounds test results.

Bounds Test

Null hypothesis: No levels relationship
Number of cointegrating variables: 2
Trend type: Rest. constant (Case 2)
Sample size: 20

Test Statistic	Value
F-statistic	10.976762

Bounds Critical Values

	10%		5%		1%	
Sample Size	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
30	2.915	3.695	3.538	4.428	5.155	6.265
Asymptotic	2.630	3.350	3.100	3.870	4.130	5.000

* I(0) and I(1) are respectively the stationary and non-stationary bounds.

The next step tests for a relationship between Gross Domestic Product (GDP), commercial bank branches, and automated teller machines (ATMs) using the F-statistic. The calculated F-value in the model was found to exceed the upper bound of the critical values. These upper-bound values were obtained from the tables in Pesaran et al. (2001) at the 1%, 5%, and 10% significance levels. The results of this model, presented in Table (03), indicate that the null hypothesis is rejected at the 1%, 5%, and 10% significance levels. Based on these findings, it is confirmed that a long-run equilibrium relationship exists among the study variables (GDP, commercial bank branches, and ATMs) in Algeria.

Error Correction Model

Based on the bounds testing results, which confirmed a cointegration relationship among the variables, we proceed to the Error Correction Model (ECM), the most appropriate framework for estimating the relationship among the study variables. This model is used when cointegration is present to establish a short-term equilibrium relationship and ultimately achieve long-term equilibrium.

Table 4: Short-run estimates for the ARDL model.

Error Correction

Dependent Variable: D(LGDP)
Method: ARDL
Date: 08/01/26 Time: 09:59
Sample: 2005 2024
Included observations: 20
Dependent lags: 3 (Automatic)
Automatic-lag linear regressors (2 max. lags): LCBK LATM
Deterministics: Restricted constant and no trend (Case 2)
Model selection method: Akaike info criterion (AIC)
Number of models evaluated: 27
Selected model: ARDL(1,1,0)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COINTEQ*	-0.163870	0.022576	-7.258682	0.0000
D(LCBK)	-0.298929	0.194125	-1.539875	0.1410

R-squared	0.358473	Mean dependent var	0.025987
Adjusted R-squared	0.322833	S.D. dependent var	0.021555
S.E. of regression	0.017737	Akaike info criterion	-5.131647
Sum squared resid	0.005663	Schwarz criterion	-5.032074
Log likelihood	53.31647	Hannan-Quinn criter.	-5.112209
F-statistic	10.05805	Durbin-Watson stat	2.326001
Prob(F-statistic)	0.005284		

* p-values are incompatible with t-Bounds distribution.

As shown in Table 04, the error correction coefficient is -0.1638, which is statistically significant at a level below 5%. Because it is negative, the error correction model is considered valid. This indicates that 16.38% of the short-term error can be corrected within the first year, facilitating a return to the long-term equilibrium. Furthermore, this reflects a relatively moderate speed of adjustment toward equilibrium; it takes about six years for Gross Domestic Product (GDP) to return to equilibrium following a shock to either explanatory variable (commercial bank branches or automated teller machines). This illustrates how quickly the Algerian economy returns to equilibrium when shocks displace it from its balanced state.

Coefficient of Determination (R^2):
The coefficient of determination is 35.84%, meaning commercial bank branches and automated teller machines (ATMs) account for 35.84% of the variation in Gross Domestic Product (GDP). In comparison, the remaining 64.16% falls within the margin of error.

F-test (Fisher's F-test):
This test assesses the overall significance of the model based on the following hypotheses:

$$\begin{cases} H_0: B1 = B2 = B3 = 0 \\ H_1: B1 \neq B2 \neq B3 \neq 0 \end{cases}$$

Based on the results, the calculated F-statistic (FC = 10.05) exceeds the tabulated F-value (FT = 3.35). Therefore, we accept the alternative hypothesis that the model as a whole is statistically significant, meaning financial inclusion indicators affect economic growth.

Estimation of the long-term relationship
Results are presented in Table 5:

Table 5: Long-term estimates for the ARDL model

Cointegrating Specification

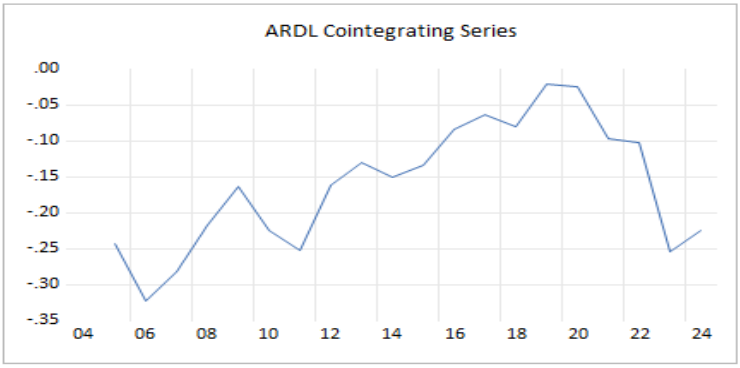
Deterministics: Rest. constant (Case 2)
CE = LGDP(-1) - (-2.956471*LCBK(-1) + 0.286652*LATM + 30.324004)

Cointegrating Coefficients

Variable *	Coefficient	Std. Error	t-Statistic	Prob.
LCBK(-1)	-2.956471	1.670237	-1.770091	0.0946
LATM	0.286652	0.071787	3.993063	0.0009
C	30.32400	2.745011	11.04695	0.0000

Note: * Coefficients derived from the CEC regression.

Cointegrating Series



Based on Table 5, which indicates the existence of a long-term relationship between the dependent variable, Gross Domestic Product (LGDP), and the independent variables, commercial bank branches (LCBK) and automated teller machines (LATM), the following results will be observed:
- The estimated constant term indicates that when the independent variables (commercial bank branches (LCBK) and automated teller machines (LATM)) are equal to zero, the Gross Domestic Product (LGDP) stands at 30.32.
- There is a negative impact of commercial bank branches on the Gross Domestic Product, which is statistically significant at the 10% significance level; specifically, a 1% increase in commercial bank branches leads to a 2.95% decrease in the Gross Domestic Product.
- There is a positive impact of automated teller machines on the Gross Domestic Product, which is statistically significant at the 1% significance level; specifically, a 1% increase in automated teller machines leads to a 0.29% increase in the Gross Domestic Product.

Stability Tests for the Error Correction Model

1. Test for Serial Correlation of Residuals:
The following table presents the results of the Breusch-Godfrey test for serial correlation of residuals:

Table 6: Results of the test for serial correlation of residuals.

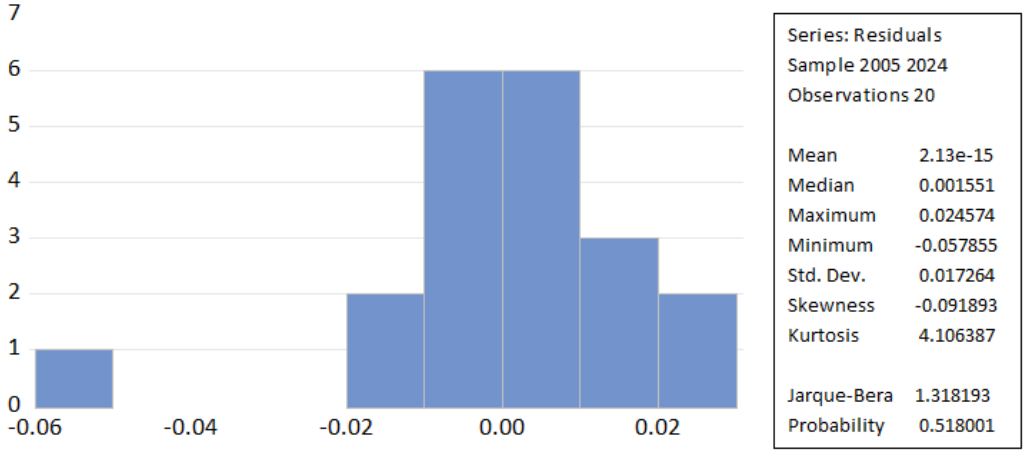
Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	0.266729	Prob. F(2,13)	0.7700
Obs*R-squared	0.788355	Prob. Chi-Square(2)	0.6742

Based on the statistical values shown in the figure above, we can accept the null hypothesis that the residuals in the error correction model are not autocorrelated. This confirms an equilibrium relationship between the model's variables in both the short and long term.

2. Testing the normality of the residuals:

Figure 2: Results of the normality test for the residuals.



The Jarque-Bera statistic is below the critical value at the 5% significance level; therefore, we accept the null hypothesis that the residual series follows a normal distribution.

3. Test for Heteroscedasticity of Residuals:

The following table presents the test results:

Table 7: Results of the heteroscedasticity test for residuals.

Heteroskedasticity Test: ARCH

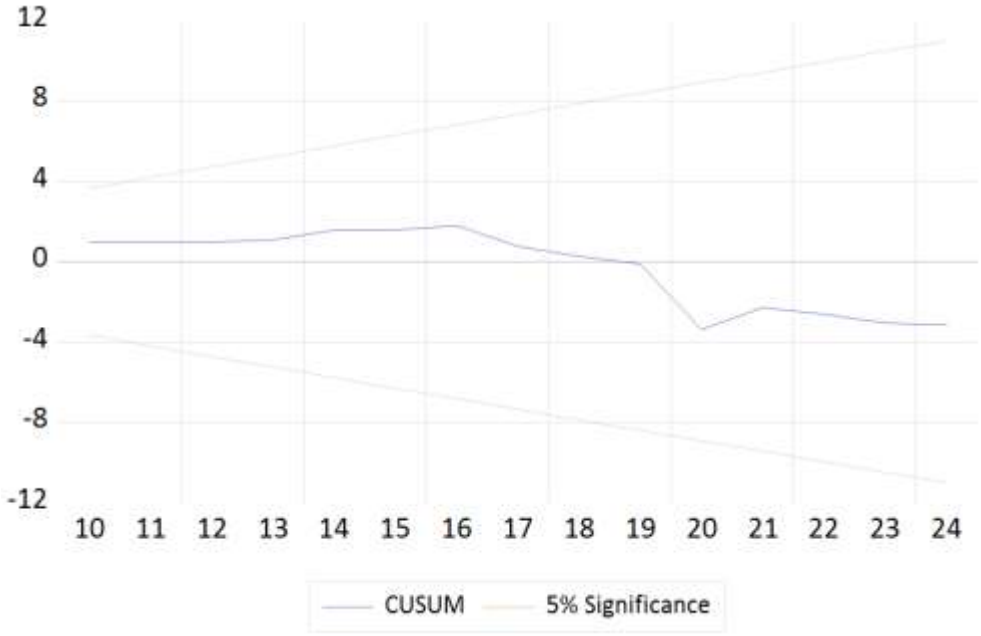
F-statistic	0.006409	Prob. F(1,17)	0.9371
Obs*R-squared	0.007160	Prob. Chi-Square(1)	0.9326

The p-value is less than 0.05; therefore, we reject the null hypothesis, which states that the variances are homogeneous.

4. Model Stability Test:

To verify parameter stability, we use the Cumulative Sum (CUSUM) test and the Cumulative Sum of Squares (CUSUM of Squares) test. The results of these tests are illustrated in the following figure:

Figure 3: Graphical representation of the CUSUM and CUSUM of Squares tests for coefficient stability in the error-correction formulation of the ARDL model.



The graphical representation shows that the cumulative sum of residuals test for this model follows a linear path within the critical boundaries, indicating model stability. Although the cumulative sum of squared residuals test crosses one critical boundary, it quickly returns to the critical region. Together, these tests show that the model remains stable in both the long and short term.

Results and recommendations:

This study examines the impact of financial inclusion on economic growth in Algeria from 2004 to 2024, using an Autoregressive Distributed Lag (ARDL) model. The analysis utilizes two indicators, the number of commercial bank branches and the number of automated teller machines (ATMs) per 100,000 adults, as proxies for the reach and accessibility of financial services.

The empirical results indicate a long-term equilibrium relationship between these financial inclusion indicators and economic growth. Specifically, the number of commercial bank branches negatively affects economic growth

(significant at the 10% level): a 1% increase in the number of branches is associated with a 2.95% decline in Gross Domestic Product (GDP). Conversely, the number of ATMs shows a positive, statistically significant impact (at the 1% level), with a 1% increase in ATMs leading to a 0.287% rise in GDP.

Algeria's low levels of financial inclusion can be attributed to several factors, including a lack of trust in financial institutions, which leads some individuals to avoid engaging with the formal banking system. Furthermore, the dominance of state-owned banks in the banking sector has constrained private-sector expansion, thereby reducing competition in the provision of financial services. High costs of providing financial services, sluggishness, and bureaucratic complexities also contribute to financial exclusion by increasing the time, effort, and expense required to complete procedures and fostering financial activities outside the formal economy. Limited adoption and use of electronic payment systems and tools hinder the financial sector's dynamism and slow the development of digital financial services. Finally, inadequate digital financial infrastructure reduces the quality, range, and affordability of financial services, thereby restricting access for various segments of society.

The study recommends focusing on the following areas to promote financial inclusion:

- Intensifying financial awareness and literacy programs.
- Developing digital infrastructure for the financial sector.
- Expanding the presence of banks and financial institutions, with a focus on geographic diversity.
- Simplifying the procedures for opening bank accounts and accessing financing.
- Encouraging innovation in financial technology (fintech).
- Establishing flexible regulatory frameworks that support financial inclusion without compromising financial system stability.

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