

تأثير صدمات السياسة النقدية والمالية على النمو الاقتصادي في الجزائر خلال الفترة 1990–2024 باستخدام نموذج

NARDL

The Effect of Monetary and Financial Policy Shocks on Economic Growth in Algeria During The 1990–2024 Period Using the Nardl Model

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Abstract

This study aims to analyze the impact of monetary and fiscal policy shocks on economic growth in Algeria during the period 1990-2024 using the NARDL model.

Using the NARDL model, the study's findings reveal that economic growth in Algeria is influenced by monetary policy shocks. Specifically, a one-unit decrease in the required reserve ratio stimulates economic growth by 0.13 units, whereas a one-unit increase reduces economic growth by 1.195 units. The results also indicate that economic growth is positively affected by the size of the labor force. In contrast, fiscal policy showed no significant impact on economic growth during the study period.

Keywords: Monetary policy, fiscal policy, economic growth, Nardl model

Jel Classification Codes : C23 ; G21; N10;P20.

Introduction

Economic growth represents the primary objective of any economic policy, serving as a key indicator of a country's capacity to improve living standards, provide employment opportunities, and enhance long-term social and economic stability. This role becomes even more critical in developing economies, where achieving growth is directly linked to the ability to address challenges such as unemployment, poverty, and income inequality. Economic policies, particularly monetary and fiscal policies, play a central role in steering economic activity toward these objectives by influencing various components of economic activity and stimulating investment.

Monetary policy, for instance, focuses on regulating the money supply, controlling inflation rates, and either stimulating or restraining aggregate demand through various instruments such as interest rates, reserve requirements, and bank credit guidance. These measures help maintain price stability and ensure the availability of sufficient financing for

both private and public sectors, thereby enhancing the economy's investment capacity and promoting productive activities.

In contrast, fiscal policy serves a complementary role by directing government expenditure and allocating financial resources to vital sectors, including infrastructure, education, health, and productive and service sectors. Such measures contribute to increasing public and private investment, improving productivity, and creating new job opportunities, which directly reduce unemployment and support sustainable economic growth. Moreover, coordination between monetary and fiscal policies is essential to achieve overall economic stability, as fiscal measures can guide aggregate demand in alignment with the monetary system's capacity to provide necessary financing, thus fostering a balanced and growth-oriented economic environment.

In the case of Algeria, the national economy has faced a series of challenges and structural transformations since the early 1990s, which have significantly affected the dynamics of economic growth. These challenges include fluctuations in oil prices, changes in government expenditure levels, banking sector reforms, and variations in the size and skills of the labor force. This context makes it essential to study the impact of monetary and fiscal policy shocks on economic growth in order to understand how these shocks are transmitted to real economic activity and to assess the Algerian economy's resilience in responding to such changes. Accordingly, the following research question arises: **How do monetary and fiscal policies contribute to enhancing economic growth in Algeria during the period 1990–2024?**

-Sub-questions:

Based on the main research question, the following sub-questions can be formulated:

- What is meant by the concepts of fiscal policy and monetary policy, and what are their main instruments?
- What is the theoretical framework of economic growth?
- How have monetary and fiscal policy shocks been reflected in economic growth?

Research Hypotheses:

In light of the above, the following hypotheses can be formulated:

- Monetary policy influences the support of economic growth levels in Algeria through the required reserve ratio.
- Fiscal policy contributes to fostering economic growth in Algeria by affecting the level of government spending.
- Economic growth in Algeria is positively influenced by the size of the labor force, particularly the youth in the working-age population, as they represent a key factor in enhancing productivity and stimulating economic activity.

Significance of the Stud

The importance of this study stems from its focus on a fundamental issue, namely the impact of monetary and fiscal policy shocks on economic growth in Algeria during the period 1990–2024 using the NARDL model. The significance lies in the fact that economic growth represents a cornerstone for achieving both economic and social stability, as well as a key indicator reflecting the effectiveness of public policies in allocating and utilizing resources efficiently. Moreover, analyzing the impact of unexpected changes in monetary and fiscal policy instruments provides a deeper understanding of how the Algerian economy responds to such shocks, thereby assisting policymakers in formulating more flexible and effective strategies to support sustainable growth.

Research Objective:

Through this study, we aim to achieve a set of objectives summarized in examining the theoretical framework of both monetary and fiscal policies as well as economic growth, and

in analyzing the impact of monetary and fiscal policies on fostering economic growth. The ultimate goal is to propose effective strategies to strengthen the levels of economic growth in Algeria.

Research Methodology:

The nature of this research necessitates the adoption of the inductive approach, by employing statistical tools and econometric techniques to estimate the impact of monetary and fiscal policy shocks on economic growth in Algeria.

Research Scope:

Based on the research question and the hypotheses formulated within its framework, and given the importance of this study and in order to achieve its objective, the temporal scope is defined as the period extending from 1990 to 2024.

1.An Empirical Analysis of Monetary and Fiscal Policy Instruments and Their Role in Promoting Economic Growth.

Macroeconomic policies, particularly monetary and fiscal policy, constitute fundamental pillars for achieving economic stability and promoting growth. Monetary policy plays a central role by regulating the money supply and interest rates, thereby facilitating investment financing and stimulating economic activity. In contrast, fiscal policy works to manage public revenues and expenditures, as well as control budget deficits, with the aim of creating a favorable environment for sustainable economic growth.

1.1. Theoretical Framework of Monetary Policy

Monetary policy represents a central tool of the central bank, aimed at regulating the money supply and interest rates, thereby directly influencing investment levels and overall economic activity while ensuring price stability. Its primary role lies in directing financial resources toward productive sectors, supporting sustainable economic growth, and mitigating economic fluctuations.

1.1.1 concept of monetary policy

Monetary policy is defined as the set of economic measures adopted by the monetary authorities, usually through a country's central bank, to control the value, supply, and cost of money in the economy, with the aim of achieving specific macroeconomic objectives set by the government. It constitutes a deliberate action by the monetary authorities to influence the quantity, cost, and availability of credit in order to attain the desired macroeconomic goals, including both internal and external balances (Ogwuche & Elizabeth, 2023, p. 30).

1.1.2. Monetary policy tools

Economic thought has developed a set of tools that monetary authorities can use to achieve the aforementioned objectives and manage their monetary and credit affairs as deemed appropriate. In general, these tools can be classified into two main types, as follows (Massaoui, 2020, pp. 16-22) :

1.1.2.1.Traditional Quantitative Tools

Also referred to as indirect technical control tools due to their indirect effect on the volume of deposits available in commercial banks, quantitative tools aim to regulate the overall money supply and credit volume. They generally consist of three main instruments:

-Discount Rate: The discount rate is the interest rate imposed by the central bank on commercial banks for rediscounting commercial papers they hold, which were previously discounted on behalf of their clients, or it refers to the interest charged by the central bank on its loans and advances to commercial banks. Through this mechanism, the central bank seeks to address cases of economic contraction and inflation ,For example, in periods of economic contraction, the central bank may adopt an expansionary monetary policy by lowering the discount rate. This encourages commercial banks to increase the rediscounting of commercial papers and raise their cash reserves, thereby reducing the cost of loans extended to

individuals and companies. As a result, clients are more inclined to borrow, expanding credit provision and increasing the money supply. Conversely, the central bank may implement a contractionary monetary policy by raising the discount rate, which reduces the quantity of money in circulation.

-Open Market Operations: Open market operations refer to the buying and selling of government securities and bonds (such as treasury bills) by the central bank in the financial market, with the aim of influencing market liquidity, the level of commercial banks' reserves, and interest rates.

To implement an expansionary monetary policy, the central bank purchases bonds from the open market, which increases liquidity in the banking system and expands the monetary base. Conversely, to pursue a contractionary monetary policy, the central bank sells bonds in the open market, reducing liquidity in the banking system. In cases of inflationary gaps, monetary authorities use this tool to decrease the money supply by selling government securities, whereas in deflationary gaps, they may take the opposite approach.

-Reserve Requirement Ratio: The reserve requirement ratio is the proportion or balance of funds that commercial banks are required to hold with the central bank in the form of cash, demand deposits, or time deposits. This instrument is a modern tool used by central banks to influence commercial banks' capacity to provide credit and create deposits.

The central bank typically adjusts this ratio to affect the money supply. In an expansionary monetary policy, it lowers the reserve ratio, allowing commercial banks to use a larger portion of their deposits for lending. Conversely, in a contractionary policy, the central bank raises the reserve ratio, reducing banks' reserves available for lending and limiting their capacity to extend credit and finance investments. Therefore, the ability of banks to grant credit is inversely related to the reserve requirement ratio: higher ratios constrain credit provision, while lower ratios expand it.

1.1.2.2. Qualitative (Selective) Tools

Qualitative tools are characterized as selective because they are directed toward specific uses of credit rather than the overall volume of credit, with the aim of influencing particular sectors of the national economy. These tools are widely used in developing countries, where the application of quantitative tools is limited due to underdeveloped financial markets and banking systems. The main qualitative methods include:

-Credit Rationing: Under this type of control, credit is regulated according to the purpose for which the loan is intended, through specific rules and procedures. The central bank establishes instructions regarding the repayment period of installments and often sets maximum and minimum interest rates as part of this process. The banks are not left free to access these loans without limitation; instead, the rules are designed to restrict the frequency of credit utilization by commercial banks. Misuse or excessive borrowing can be countered by the monetary authority by increasing the cost of credit, thereby reducing the demand for money.

-Direct Influence and Moral Persuasion: This involves guidelines, instructions, and advice provided by the central bank to commercial banks regarding credit provision and allocation. This policy focuses on advising banks, particularly to encourage expansion in lending, while monitoring for potential risks to the national economy. Moral persuasion can take various forms, such as sending circulars to banks or warning them against rediscounting certain commercial papers. The success of this approach depends on the voluntary compliance and understanding of commercial banks regarding the central bank's policy, which explains its effectiveness in some countries and its failure in others.

1.2. Theoretical framework of fiscal policy

Fiscal policy plays a fundamental role in guiding the national economy by managing public revenues and expenditures and controlling the fiscal deficit, with the goal of achieving comprehensive economic stability and promoting growth. Studying the tools and mechanisms of fiscal policy is essential for understanding how they impact economic activity and direct resources toward productive sectors to achieve the country's development goals.

1.2.1. The concept of fiscal policy

Fiscal policy is defined as the set of measures undertaken by a state regarding the management of its financial activities (revenues and expenditures) in a manner that stimulates various sectors of the national economy to achieve objectives such as meeting the society's needs for goods and services, ensuring economic stability, promoting equitable distribution of income and wealth, and achieving sustainable financial development through the plans and programs of fiscal policy (Al-Mashhadani & Nabil, 2014, p. 34). The International Monetary Fund (IMF) defines fiscal policy as the sound management of a state's public finances through prudent administration of its resources and effective allocation of expenditures, along with transparency in budget execution, enabling the state to integrate into the global economy. From the perspective of the World Trade Organization (WTO), fiscal policy is viewed as a set of measures and actions that precisely and effectively direct public spending with the aim of liberalizing foreign trade by conceding a portion of sovereign revenues (Al-Aqoun, 2020, p. 4).

Fiscal policy can generally be understood as a set of measures and decisions adopted by the state with the aim of influencing various indicators of economic, social, and political activity. This policy relies on the use of key instruments, including the tax system and public expenditure mechanisms, to achieve a range of strategic objectives, most notably enhancing national economic growth, promoting development, and ensuring economic and social stability by reducing disparities among social classes.

1.2.2. Fiscal policy tools

Fiscal policy refers to the use of public authority over state revenues, such as taxes and public levies, as well as public expenditures through the national budget, in order to influence economic activity and achieve various economic objectives. Accordingly, the main instruments of fiscal policy are threefold: taxation, public spending, and the state budget (Tawfiq Al-Shammari & Taher, 2009, p. 397).

-Taxation: A tax is defined as a sum of money compulsorily levied by the public authority on individuals and institutions, on a definitive basis and without direct compensation, in order to achieve the objectives of society (ahmad, 2015, p. 78).

-Public Expenditure: Public expenditure is defined as a sum of money disbursed from the state treasury through its various administrations, institutions, and ministries in order to meet the collective needs of society. It is also described as a monetary amount spent by a public authority with the objective of achieving a public benefit (Nashed, 2000, p. 27).

1.2.3.Objectives of Fiscal Policy:

Fiscal policy is considered one of the most important tools of economic policy, as it enables the state to influence a range of economic variables to achieve specific objectives within a defined period. The primary aim of fiscal policy is to impact various sectors of the national economy and to regulate the economic relationships within society. Its main objectives can be summarized in the following points (Boukaftan, 2023, pp. 11-12):

-Fiscal Balance: This refers to the optimal use of state resources, taking into account three key aspects. First, the tax system should possess characteristics that align with the needs of the general budget in terms of flexibility and sufficiency. Second, it should simultaneously serve the interests of taxpayers regarding fairness, collection schedules, and efficiency.

Finally, borrowing should be used solely for productive purposes. Achieving fiscal balance consequently leads to economic stability.

-Optimal Income Distribution: Fiscal policy aims to ensure a more equitable distribution of income, commonly referred to as social justice. This entails that all individuals enjoy rights and freedoms without discrimination, and have equal opportunities to derive satisfaction from goods and services purchased by marginal income units. If this is not achieved naturally, the state should intervene by setting minimum and maximum wage limits, thereby providing equal opportunities among citizens, reducing disparities between social classes, and narrowing the gap in income and wealth.

-Economic Growth and Development: Fiscal policy seeks to stimulate the economy and accelerate development.

-Economic Stability: One of the main objectives of fiscal policy is to maintain overall economic stability.

1.3.Theoretical framework for economic growth

Economic growth is regarded as one of the fundamental concepts in economics, as it reflects the ability of nations to expand production and improve living standards over time. Its significance lies in being a key indicator of the effectiveness of economic policies and the efficiency of resource utilization.

1.3.1.Definition of economic growth

Economic growth is defined as the increase in a nation's capacity to provide a diverse combination of economic goods to its population. This expanding productive capacity is built upon technological progress as well as the institutional and ideological adjustments required for such advancement. In capitalist thought, economic growth is also understood as the rise in the production of goods and services sufficient to meet the aggregate needs of society and to generate a surplus, thereby achieving a higher level of welfare (Mohoni, 2015, p. 22). From these definitions, the following points can be inferred (Qasoum Misawi, 2018, pp. 36-37):

-Economic growth refers to the increase in gross domestic product (GDP), which represents a quantitative change in production. This increase should occur at consistent and stable rates over a long period of time.

-The increase must be expressed in real terms, meaning that the impact of inflation should be excluded.

-Economic growth does not necessarily require structural transformations within the national economy.

-The growth rate should exceed the rate of population growth in order to ensure a rise in per capita output.

1.3.2.Elements of economic growth

Economic growth is perceived as the outcome of the interaction of several fundamental factors, whose balanced coordination leads to sustainable expansion in economic activity. The key elements can be summarized as follows (2019, pp. 119-120) :

-Labor: The human resource represents the cornerstone of any development process. Its impact depends on population size, demographic structure, and the level of human capital. An increase in population expands the labor supply; however, its effect on per capita national income is determined by the efficiency with which this resource is utilized. Consequently, investment in education, training, and the development of professional skills is essential for enhancing productivity and, in turn, fostering economic growth.

-Capital: This refers to the various physical assets employed in the production of goods and services, such as machinery, equipment, and infrastructure. Capital is considered a key driver

of growth through its role in strengthening productive capacity, supporting technological innovation, and expanding output levels via diverse investments.

-Technological progress: This reflects advancements in production methods or in the characteristics of goods produced. It enables larger outputs with the same amount of inputs, or the same output with fewer resources. Technological progress also helps overcome production bottlenecks, introduces new and higher-quality products, and is thus regarded as a qualitative factor that enhances the efficiency of production processes and boosts economic growth rates.

1.3.3. Types of Economic Growth

Economic growth can be classified into several forms depending on the underlying factors and their main characteristics. The most notable types include (Malouah & Makid, 2020, p. 128) (Farhoul, 2020, pp. 79-80):

- Extensive growth: This occurs when the rate of increase in national output is approximately equal to the rate of population growth, leading to a constant level of per capita income without significant improvements in living standards.

-Intensive growth: This takes place when national output grows at a faster pace than population growth, resulting in higher per capita income and improved purchasing power for individuals.

-Planned or directed growth: This type emerges from government intervention through the adoption of structured economic plans aimed at achieving specific objectives. Its effectiveness depends largely on the precision, flexibility, and adaptability of the policies to both internal and external changes.

-Spontaneous or autonomous growth: Generated from the economy's internal dynamics without direct central planning, this form of growth is usually gradual and irregular, and may occasionally experience short-term fluctuations.

-Temporary or incidental growth: Arising from exceptional or unforeseen circumstances such as global crises or international market volatility, this type is characterized by its temporary nature, disappearing once the triggering factors subside.

-Jobless growth: This occurs when national output expands without corresponding improvements in employment levels. In such cases, the economy may record notable growth rates while unemployment remains persistently high, reflecting a weak capacity to generate sufficient job opportunities.

1.4. Literature Review

The relationship between macroeconomic policies and economic growth has received considerable attention in the economic literature, particularly in light of cyclical fluctuations and structural transformations experienced by most developing economies since the early 1990s. Numerous international studies have indicated that monetary and fiscal policies constitute key instruments for promoting economic growth (Utouh & Kitole, 2025, pp. 1-4). In this context, Lagoutin (2017) highlighted that coordinating fiscal and monetary policies, including their orientation towards controlling inflation, can contribute to fostering sustainable economic growth. Other studies have also shown that government intervention through economic policies reduces the volatility of key economic indicators, thereby enhancing growth stability (Mykola, Valeriy, Tetiana, & Andriy, 2021, pp. 42-52).

Consequently, central banks aim, through the implementation of monetary policies, to maintain price stability, while governments, by adjusting fiscal policies that regulate revenue collection, allocate expenditures, and avoid budget deficits, seek to create favorable conditions for economic development (Pathairat & Htwe, 2025, pp. 1-17)

Regarding monetary policy, it is considered a central tool for achieving economic growth by directly influencing the money supply and interest rates, reflecting the central

bank's ability to direct investment activity and facilitate financing for development projects. The main mechanisms employed to achieve this objective include:

-Reduction of the discount rate: This encourages commercial banks to borrow from the central bank at lower interest rates, enabling them to offer loans to investors at reduced rates, thereby stimulating investment volumes and increasing national income, which supports economic growth.

-Reduction of the legal reserve ratio: This increases commercial banks' capacity to create money, expanding the money supply and lowering interest rates, which incentivizes investors to increase investments, contributing to economic growth.

-Open market operations: By purchasing government securities, treasury bills, and bonds, the central bank injects liquidity into the market, increasing the money supply and providing the necessary financing for development projects (Ben Daas, 2010, pp. 250-251).

Fiscal policy can also reinforce economic growth levels through its instruments, notably government spending and taxation (Hibor & talab, 2023, p. 241).

2. Measuring the Impact of Monetary and Fiscal Policy on Economic Growth in Algeria

The content of this section revolves around examining the impact of monetary and fiscal policy on economic growth in Algeria during the period 1990–2024. To highlight this, we will conduct an econometric analysis through the following steps:

2.1. Study Variables and the Model Used

The analytical nature of this study requires the use of econometric tools to construct and test the optimal model in line with the research objectives. Given that the study focuses on the impact of monetary and fiscal policy shocks on economic growth in Algeria during the period 1990–2024, a set of key variables has been identified to be employed in the estimation and empirical testing, in order to reveal the nature of the economic relationships under investigation.

Table 01: Definition of variables

symbol	index	variables	Explanation
dependent variable			
y	GDP growth rate	economic growth	Economic growth is the sustained increase in the total output of goods and services within an economy over a given period of time.
independent variables			
X ₁	Legal reserve ratio	Monetary policy	The legal reserve ratio is one of the most prominent tools of monetary policy, as it helps direct liquidity within the economy to enhance economic growth.
X ₂	government spending	fiscal policy	Government spending is considered one of the most important tools of fiscal policy. It contributes to stimulating economic growth by directing resources toward public investments in infrastructure, education, and health, which enhances productivity and supports economic activity. It also creates new job opportunities and stimulates aggregate demand, which positively impacts economic growth and social stability.
X ₃	Working age group		The expansion of the working class within the economy is a key factor supporting economic growth, contributing to higher productivity and

			increased capacity to generate goods and services. The integration of a broad segment of the labor force, particularly youth, also stimulates the economic cycle by stimulating consumption and investment, creating a positive dynamic that increases growth rates and enhances long-term economic stability.
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Source: Prepared by the researcher

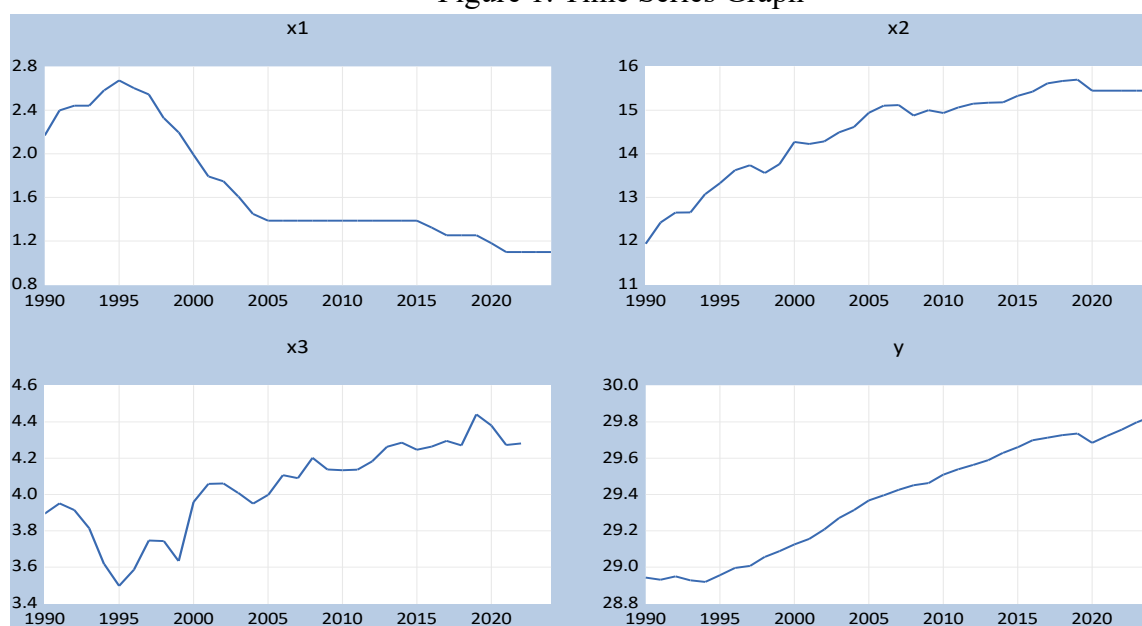
2.2 Model Estimation

To capture the dynamic relationships among the study variables, the model estimation will follow a structured econometric methodology designed to ensure both accuracy and objectivity of the results.

2.2.1 Stationarity Analysis of Time Series

Assessing the stationarity of time series represents a critical preliminary step in econometric analysis, as the reliability of statistical tests and model estimates heavily depends on the stochastic properties of the data. Non-stationary series may produce spurious regressions and misrepresent the true dynamics among economic variables. Accordingly, testing for stationarity is essential to validate the robustness of the estimates and guarantee the credibility of the results. Prior to conducting the formal stationarity tests, a graphical exploration of the study variables will be presented to provide initial insights into their behavior over time.

Figure 1: Time Series Graph



Source: Prepared by the researcher

The stability results were as follows:

Table 2: Unit root test

time series	At level					
	ADF test			PP test		
	With Constant & Trend	With Constant	Without Constant & Trend	With Constant & Trend	With Constant	Without Constant & Trend

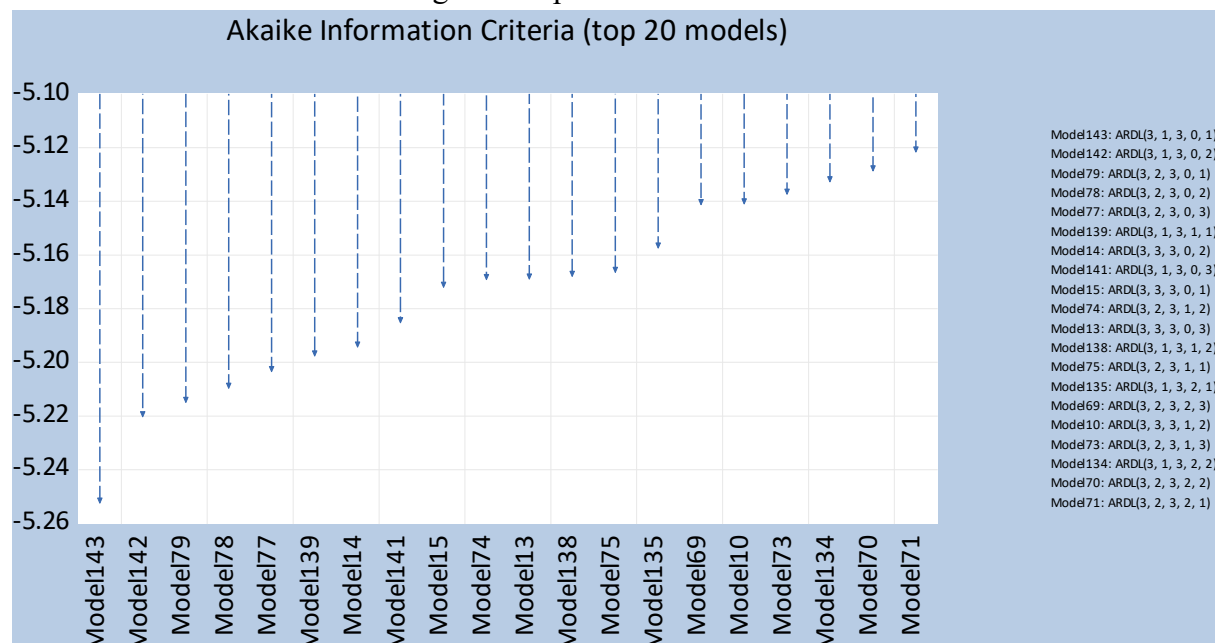
	b=0	$\lambda=0$	c=0	$\lambda=0$	$\lambda=0$	b=0	$\lambda=0$	c=0	$\lambda=0$	$\lambda=0$
y	0.103	0.752	0.994	0.975	0.999	0.103	0.518	0.994	0.944	0.999
x ₁	0.023	0.039	0.778	0.914	0.201	0.164	0.529	0.778	0.860	0.149
	0.509	0.454	0.206	0.455	0.997	0.509	0.454	0.206	0.455	0.997
x ₃	0.1393	0.7772	0.6297	0.8547	0.3119	0.1393	0.6060	0.6297	0.7906	0.3681
At First Difference										
y	0.975	0.009	0.688	0.001	0.0000	0.975	0.009	0.688	0.001	0.0000
x ₁	0.105	0.004	0.719	0.006	0.0000	0.277	0.0322	0.719	0.006	0.0000
x ₂	0.109	0.000	0.322	0.000	0.000	0.109	0.000	0.322	0.000	0.000
x ₃	0.8395	0.0041	0.4578	0.0006	0.0000	0.8395	0.0033	0.4578	0.0005	0.0000

Source: Prepared by the researcher

2.2.2 Cointegration Test

Since the time series are not integrated of the same order, it is not possible to test for cointegration using the Johansen approach. Therefore, the Bounds Testing Approach is employed. However, before conducting this test, it is necessary to estimate the optimal ARDL model, followed by specifying the optimal nonlinear form of the model (NARDL). The model will be estimated, and the optimal lag lengths will be determined using the Akaike Information Criterion (AIC), which is widely recognized for its efficiency in model selection. In this context, the econometric software EViews 12 was utilized, as it generates a comprehensive summary of the most suitable models based on the AIC, while accounting for various lag structures. This procedure ensures the robustness and reliability of the estimated model.

Figure 2: Optimal ARDL Model



Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

It is clear from the graph that the minimum value of the AIC criterion is associated with the highest column, given that the values are negative, which indicates that the optimal model to represent the relationship under study is the ARDL(3,1,3,0,1) model.

The results of the joint integration were as follows:

Table No. 3: Results of Wald test to confirm the existence of the simultaneous integration relationship

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
Asymptotic: n=1000				
F-statistic	5.104466	10%	2.2	3.09
k	4	5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The results of the ARDL Bounds Test showed that the calculated value of the F statistic reached (5.10), which is clearly above the upper critical limits at the significance levels. This indicates that the studied variables move together in the long run, despite their short-term fluctuations.

2.2.3. Estimation of long-term parameters and error correction model

A- Estimation of long-term parameters:

Table 4: Results of long-term parameter estimation

Levels Equation				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
X1 NEG	-0.134419	0.026306	-5.109861	0.0001
X1 POS	-1.950485	0.809927	-2.408222	0.0277
X2	0.030705	0.020431	1.502899	0.1512
X3	1.156940	0.053680	21.55238	0.0000
C	9.448590	0.823462	11.47423	0.0000

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

b- Estimation of short-term parameters and error correction model

Table 5: Results of short-term parameter estimation.

ARDL Error Correction Regression
 Dependent Variable: D(Y)
 Selected Model: ARDL(3, 1, 3, 0, 1)
 Case 2: Restricted Constant and No Trend
 Date: 08/26/25 Time: 15:56
 Sample: 1990 2024
 Included observations: 30

ECM Regression Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(Y(-1))	0.657782	0.138488	4.749733	0.0002
D(Y(-2))	0.472799	0.138463	3.414617	0.0033
D(X1 NEG)	0.011700	0.038194	0.306345	0.7631
D(X1 POS)	-4.427325	0.688184	-6.433343	0.0000
D(X1 POS(-1))	0.862131	0.138902	6.206756	0.0000
D(X1 POS(-2))	-0.918676	0.150412	-6.107744	0.0000
D(X3)	18.21139	2.774915	6.562866	0.0000
CointEq(-1)*	-1.316038	0.209041	-6.295607	0.0000

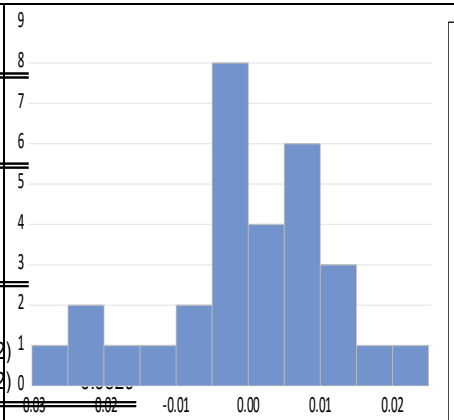
Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The results showed that the value of the error correction coefficient (-1.31) is negative and significant at the (1%) level, which confirms the existence of a long-term equilibrium relationship between the variables, and reflects a relatively high speed in the return of the economic growth rate to its equilibrium path after any short-term shock.

2.3- Diagnostic tests for the estimated model

It is observed from all the tests presented in Table 6 that this model does not suffer from any econometric problems.

Table 6: results of tests that reveal standard problems.

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags				Series: Residuals Sample 1994 2023 Observations 30 Mean -7.43e-14 Median 7.51e-12 Maximum 0.023712 Minimum -0.027311 Std. Dev. 0.011551 Skewness -0.537997 Kurtosis 3.175701 Jarque-Bera 1.485794 Probability 0.475734
F-statistic	0.432952	Prob. F(2,15)		
Obs*R-squared	1.637292	Prob. Chi-Square(2)		
Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity				
F-statistic	0.884601	Prob. F(12,17)		
Obs*R-squared	11.53192	Prob. Chi-Square(12)		
Scaled explained SS	4.028342	Prob. Chi-Square(12)		

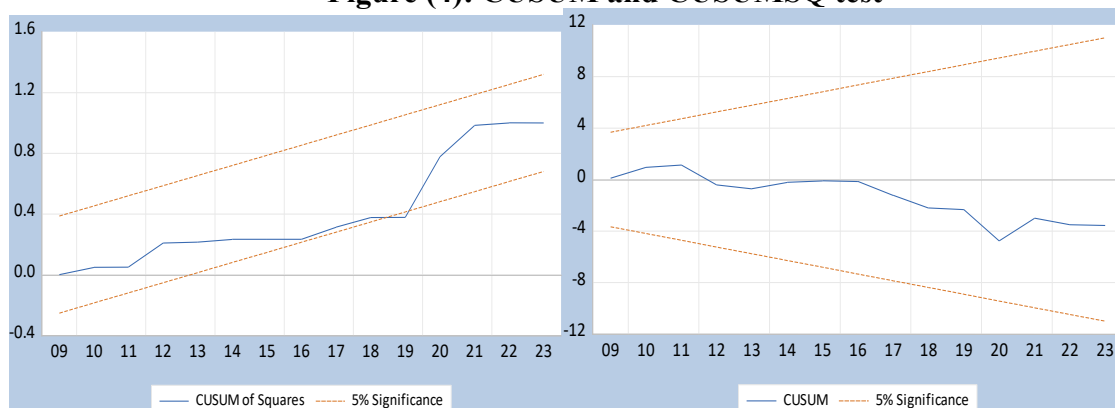
Ramsey RESET Test Equation: UNTITLED Omitted Variables: Squares of fitted values Specification: $YY(-1) Y(-2) Y(-3) X1_NEG X1_NEG(-1) X1_POS X1_POS(-1) X1_POS(-2) X1_POS(-3) X2 X3 X3(-1) C$			
	Value	df	Probability
t-statistic	0.487448	16	0.6326
F-statistic	0.237606	(1, 16)	0.6326
Likelihood ratio	0.442235	1	0.5060

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

2.4. Testing the structural stability

The study relied on two tests to assess the presence of any potential structural collapses in the data over time: the CUSUM test and the CUSUMSQ test. The results presented in Figure 4 indicate that the statistics of both tests fall within the critical limits at the 5% significance level, reflecting the structural stability of the estimated coefficients in the ARDL model.

Figure (4): CUSUM and CUSUMSQ test



Source: Eviews 12

2.5 Testing the symmetry of parameters in the short and long term

For the independent variable X1

- Long term

Table No.7: Results of Wald's long-run symmetry test (variable x1)

Wald Test: Equation: LRFORM			
Test Statistic	Value	df	Probability
t-statistic	-2.217145	17	0.0405
F-statistic	4.915732	(1, 17)	0.0405
Chi-square	4.915732	1	0.0266

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The results indicate that the estimated F-statistic falls below the critical threshold at the 5% significance level, confirming the presence of asymmetric adjustment of the legal reserve

variable, which represents the monetary policy instrument in response to both positive and negative shocks.

Table No.8: Results of the Wald test for short-run symmetry (variable x1):

Wald Test: Equation: LRFORM			
Test Statistic	Value	df	Probability
t-statistic	-3.081085	17	0.0068
F-statistic	9.493085	(1, 17)	0.0068
Chi-square	9.493085	1	0.0021

Source: Prepared by the researcher based on the outputs of the Eviews 12 program.

The results indicate that the estimated F-statistic falls below the critical threshold at the 5% significance level, confirming the presence of asymmetric adjustment of the legal reserve variable, which represents the monetary policy instrument in response to both positive and negative shocks.

3. Analysis and discussion of the results:

$$9.448 - 1.195x_1POS - 0.1344x_1NEG + 0.0307x_2 + 1.569x_3$$

-The estimation results support the first hypothesis, which posits that monetary policy affects the enhancement of economic growth levels in Algeria through the required reserve ratio. It was found that a one-unit decrease in the required reserve ratio contributes to an increase in economic growth by 0.134 units, whereas a one-unit increase in the ratio suppresses economic growth by 1.95 units. This effect can be attributed to the fact that a lower reserve requirement increases bank liquidity and their capacity to finance investment and lending, thereby stimulating economic activity, while a higher reserve requirement reduces available liquidity, consequently constraining the financial sector's ability to support growth.

-The estimation results indicate that the second hypothesis, which posits that fiscal policy contributes to enhancing economic growth in Algeria through its impact on government spending, was not statistically supported. This is attributed to the insignificance of the government spending variable in the model, suggesting that changes in public expenditure were insufficient to produce a noticeable effect on economic growth during the study period. This outcome may be due to structural constraints in the efficiency of resource utilization or to external factors, such as fluctuations in oil prices and global economic volatility, which could mitigate the impact of fiscal policy on economic activity.

-The estimation results of the regression equation support the third hypothesis, which posits that economic growth in Algeria is positively influenced by the size of the labor force, particularly the youth segment of working age, as they represent a crucial element in enhancing productivity and stimulating economic activity. It was found that an increase of one unit in the labor force contributes to raising economic growth by 1.15 units. This effect can be attributed to the fact that an expanding labor force enhances the economy's productive capacity, stimulates aggregate demand, and encourages investment, thereby creating a positive dynamic that supports long-term economic growth. Moreover, young workers constitute an innovative and energetic force that helps improve production quality and develop work methods.

4. Conclusion

This study examines the impact of monetary and fiscal policy shocks on economic growth in Algeria during the period 1990–2024 using the NARDL model. The topic holds significant importance due to the role of economic policies in directing resources and stimulating economic activity, as well as in understanding how economic growth responds to unexpected changes in monetary and fiscal policy instruments. The study aims to provide a precise analytical perspective to assist policymakers in formulating effective strategies to promote sustainable economic growth. The analysis has led to a set of key findings, which can be summarized as follows:

-Impact of Monetary Policy:

- It was found that the reserve requirement rate has a significant effect on economic growth, as a reduction in the rate stimulates economic growth, while an increase dampens economic activity, reflecting an asymmetric response of economic growth to monetary policy shocks.

-Impact of Fiscal Policy:

- Government spending did not exhibit a statistically significant effect on economic growth during the study period, indicating the limited capacity of fiscal policy to stimulate the economy under structural constraints and low efficiency in resource utilization.

-Role of the Labor Force:

- The results confirm that the size of the labor force, particularly working-age youth, significantly enhances economic growth, as they represent a key driver of productivity and economic activity.

- The results revealed an asymmetric response of economic growth to positive and negative monetary policy shocks, which supports the use of the NARDL model to analyze these relationships.

Based on the results extracted from this study and presented above, we can offer some recommendations as follows:

- It is recommended to adopt flexible monetary policies aimed at improving bank liquidity and stimulating investment, with a focus on developing human capital, alongside reconsidering government spending mechanisms to enhance the effectiveness of fiscal policy in supporting economic growth.

- Reassess government spending mechanisms to increase their efficiency in stimulating economic activity, directing resources toward productive sectors and essential services that directly impact growth.

- Invest in education and vocational training for youth to enhance labor force skills and increase productivity.

- Encourage innovation and entrepreneurship programs to channel youth energies into productive and innovative projects that support sustainable growth.

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