Сучасні макроекономічні тренди та тенденції

Modern macroeconomic trends and tendencies

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The nexus between monetary base and government debt - empirical evidence from Algeria

Abstract. The complex interplay between monetary and fiscal policies is crucial for macroeconomic stability, especially in emerging economies like Algeria. Algeria's heavy reliance on oil revenue adds a unique layer of complexity, as global oil price fluctuations significantly impact government finances. This study investigates the relationship between the monetary base and government debt, a crucial aspect of understanding how fiscal and monetary policies interact in this context.

Problem statement. This study aims to analyze the relationship between the monetary base (M1) and government debt in Algeria, examining how this nexus influences the effectiveness of both fiscal and monetary policies.

Unresolved aspects of the problem. The unresolved issues in our work is the real dynamics between fiscal and monetary policies in the side of government debt management.

Purpose of the article. By understanding this relationship, the study aims to provide valuable insights for policymakers regarding potential consequences of their decisions and the importance of coordination for achieving long-term macroeconomic stability.

Presentation of the main material. The study employs a time-series econometric approach using the Autoregressive Distributed Lag (ARDL) model. This approach allows for the analysis of the long-term cointegration between the monetary base and government debt, using data from 1990 to 2024. The analysis also incorporates a simulation using MATLAB to visualize the relationship between the two variables over a 20-year horizon.

Conclusions. The results of the ARDL analysis indicate a statistically significant negative relationship between lagged government debt and M1, suggesting that higher government debt levels in the previous period lead to a decrease in the monetary base in the current period. This finding suggests that Algeria's non-Ricardian fiscal policy, which relies on increasing public debt ratios to satisfy budgetary constraints, has a notable impact on the monetary base. The simulation results further illustrate the short-term effects of government debt on Algeria's monetary base, emphasizing the need for careful coordination between fiscal and monetary policies to ensure long-term macroeconomic stability.

Keywords: *Algeria, Monetary base, Fiscal policy, Simulation, Government debt.*
Formulas: -; fig.: 1; tabl.: 1; bibl.: 30.

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Introduction. In emerging economies like Algeria, macroeconomic stability depends on the complex interaction between monetary and fiscal policy. This study examines the relationship between the monetary base and government debt and how it affects Algeria's dynamic monetary and fiscal policy. This complex link provides crucial insights into policy efficacy, economic development, and public budgets.Due to recent economic upheavals, research on monetary and fiscal policy interconnections has increased worldwide(Afonso et al., 2019; Ahmed, 2020; Albonico & Rossi, 2017; Azad et al., 2021; Cevik et al., 2014; Chadha & Nolan, 2019; Dimakou, 2015; Foresti, 2018; Pacifico, 2021). From the 1970s Great Inflation to the Great Financial Crisis and worldwide pandemic, experts have struggled with policy coordination, conflict, and economic stability. The literature provides significant insights, but developing economies, especially those with distinctive structural traits and historical settings, have yet to be thoroughly examined.

Algeria is a fascinating example. As a resource-rich nation with a history of economic instability, authorities must balance economic growth, inflation, and fiscal sustainability. Algeria's heavy reliance on oil income complicates the conventional divide between monetary policy, which seeks price stability, and fiscal policy, which manages state finances and promotes growth. Global oil price fluctuations can significantly affect government finances, making policy coordination difficult.This background is crucial to the monetary base-government debt link. Open market activities of central banks affect bank reserves and interest rates. Government debt, on the other hand, indicates the government's accumulated borrowing and may affect monetary policy. The necessity to fund government debt may limit the central bank's capacity to manage the money supply and control inflation if these variables are closely related. This increases economic volatility and hinders macroeconomic stability (Foresti, 2015; van Aarle et al., 1995).

The literature on monetary and fiscal policy linkages suggests four important Algerian considerations:

- Debt Sustainability and Fiscal Dominance: Fiscal dominance, when fiscal policy trumps monetary policy, might threaten macroeconomic stability (Sargent & Wallace, 1981).Algeria relies on hydrocarbon earnings. Hence, government expenditure is typically impacted by short-term oil price swings, resulting in unsustainable debt. This may impair the central bank's money supply management and cause inflation. Algeria's policymakers must understand fiscal dominance and debt sustainability.
- Mechanisms for transmitting monetary policy : The transmission mechanisms of monetary policy determine its efficacy in influencing economic activity. Algeria's financial sector structure, shallow financial markets, and informal financing channels might make monetary policy signals challenging to transmit. The relationship between interest rate fluctuations and investment decisions, especially in non-hydrocarbons, remains essential to study.
- Policy Cooperation and Credibility: Monetary and fiscal policies depend on officials' cooperation and commitment to common goals. Algerian monetary and budgetary authorities might lose credibility if policy intentions are not transparent and communicated. This can decrease investment decisions, increase economic volatility, and enhance economic actor uncertainty.
- Institutional and structural factors: Economy-wide structural characteristics and institutional frameworks affect monetary and fiscal policy efficacy. These include tax system efficiency, governance, financial sector regulation, and legal system strength. Effective policy interventions require understanding how these structural elements shape policy interactions.

By focusing on the Algerian economy, this study adds to the literature. We will use a time-series econometric approach to study the long-run connection between the monetary base and government debt, allowing for non-linearity.

This paper seeks to contribute by analysing the monetary base and government debt nexus and its effects on fiscal and monetary policy interactions in Algeria:

- Better grasp Algerian policy dynamics: The study's detailed empirical research of the monetary base and government debt sheds light on Algerian policy dynamics.
- Inform policymaking and promote economic stability: The study will help policymakers understand the possible effects of their policy choices, guiding their long-term macroeconomic stability initiatives.

The study's findings will add to the literature on monetary and fiscal policy interactions in emerging countries, highlighting their specific difficulties and potential. This paper uses a rigorous econometric methodology to examine Algeria's long-term monetary base-government debt connection. We examine how this nexus affects monetary and fiscal policy, not just its presence. We aim to improve policymakers' understanding of Algeria's policy landscape and help them adopt effective and sustainable economic policies by disentangling causal linkages and identifying policy drivers.

Literature review. Delving into the nature of the relationship between the monetary base and the government debt ratio is extremely important. As this topic determines the status of the economy, as it touches on several other variables. More than that, this relationship reflects the nature of the relationship between the financial and monetary authorities on the part of strategic interactions in the construction of Public economic policies.

(Dwyer, Nov., 1985) touched upon the wide debate regarding the extent of the impact of governments ' deficits and increasing fiscal policy, and its effects on various economic aspects, especially its implications on the work of monetary policy for an economy and the various variables on which interest rates and the monetary base are based . (Beard & McMillin, 1986) Studied the Features of the relationship between the Federal Reserve and various variables that affect its behavior, such as government deficits, bureaucratic obstacles and interest rates according to a standard approach.

(Woodfrod, August 1995) Touched upon the concept of the current values of surpluses for the future of the government budget and the extent to which they are influenced by the conduct of monetary policy in the aspect of the management of the monetary base in the economy. (Garcia, 1998) Connected public debt and monetary base with other variables such us fiscal surplus, real interest rate, and income growth. (Filardo, Mohanty, & Moreno, 2012) Pointed the impact of the size and maturity structure of the government debt market on monetary policy. Same work by (BARTKOWIA, BOITAN, & CAMPEANU, 2020).

When studying the link between monetary base and government debt, it is impossible to bypass the idea of financial inflation caused by expansionary fiscal policy, since (Ryan-Collins, october,2015) explored the theoretical aspect that restricts monetary policy by coinciding all high debt rates with a reduction in interest rates. The most important results came that the policy of stimulating demand through direct financing from the central bank causes uncontrolled inflation. In the same context, (Leão, july,2015) showed that in the case of financing the deficit at the launch stage of the expansionary fiscal policy through a new additional monetary base, inflationary consequences and pressures could be avoided. In addition, the private sector should be aware at this stage of the process of seeking new ways to provide capital. After that, (Romero & Marín, January-June, 2017) concluded that increases in public debt ratios are inevitably inflationary increases. Lately, (Ma & Qamruzzaman, 2022) assessed the cointegration between government debt and uncertain economic policies Based on several standard methods (ARDL, NARDL, Fourier Toda-Yamamoto causality tests). The results showed the existence of negative long run nexus.(Leclaire, 2023) defending the MMT (Modern Monetary Theory) confirm the key role of money base as part of the central bank budget, and its link with public debt which could be a replacement of money base in the central bank budget.

Furthermore, (Thadden, june,2003) took the study of government debt behavior under two monetary policy rules. Mai finding showed that under ’’constant money growth rule’’ there is range for reassessments of public debt. On the other hand, when monetary policy adopts an explicit inflation-targeting rule, additional budget constraints are required. The previous study was in the

framework of active monetary policies offset by a passive fiscal policy, but what (Blommestein & Turner, 2012) did was to argue the phenomenon of the growth of government debt and its impact on the interactions of the management of government debt and the functionality of monetary policy. We remain within the framework of monetary financial interactions and the concept of debt monetization by the central bank after moving in the same approach, as when government bonds are traded between financial institutions during open market operations. Such operations affect the bank's reserves, which subsequently affects the monetary base, (Ahmed, 2019) by measuring the correlation between government debt and the monetary base; he found that there is stability in the long term and an inverse relationship in the short term. Same as (Andolfatto & Martin, 2018) debates on how could fiscal authority regime (Ricardian or non -Ricardian) influence central bank long-term inflation control.

From what we have discussed in the previous research analysis, the mutual influence of government debt and money in the economy becomes clear, since most studies touch on money in the broadest sense. The results of researchers vary, on the one hand, some establish a long-term relationship, and on the other hand, some deny the existence of mutual influence. Our work aims to limit the concept of money to the monetary base, which includes fast-circulating money, since it has a direct relationship with the price level, which in turn is affected.

Theoretical background

The gross public debt to GDP ratios reached their highest levels during the period 1990-2000, averaging 79.70%, with the lowest value in 2000 at 53.4% and the highest value in 1994 at 106.3%. The years 1995-1996 also defined values that exceeded 90%. This reflects the large size of the public debt compared to the internal product of Algeria, which experienced negative rates of development between the years 1991-1994 and the average percentage of internal product growth was 1.72% during this period, which is a weak percentage. This stage was characterized by average ratios of the monetary base to internal output, this is due to the restrictive policies imposed by the International Monetary Fund on Algeria within the framework of the agreements concluded between them, where the highest value of the monetary base ratio reached 61.77% in 1990 and then fell to a value that stabilized around 50% in the subsequent years between 1991-1994 and then decreased to 33% in 1996, and the average ratio of the monetary base during the period 1990-2000 was equal to the value of 44.26% and it is an acceptable value given the circumstances experienced by the families during that transitional period.(as shown in figure 01 and figure 02)

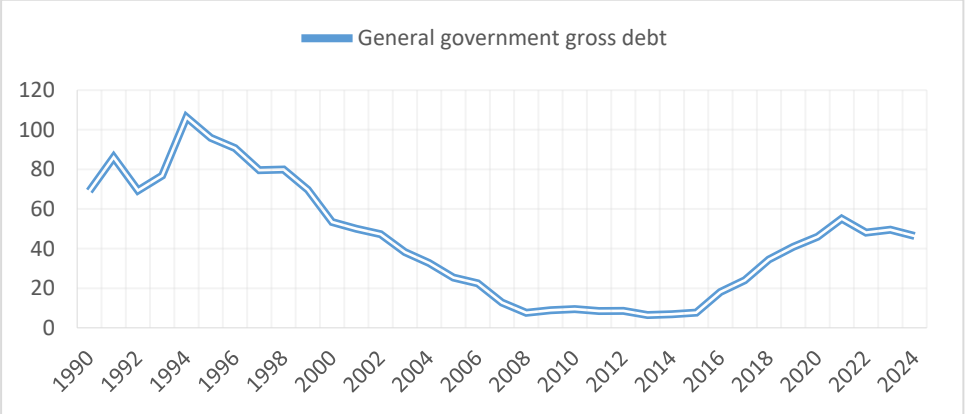


Fig. 1. General government gross debt.
Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].

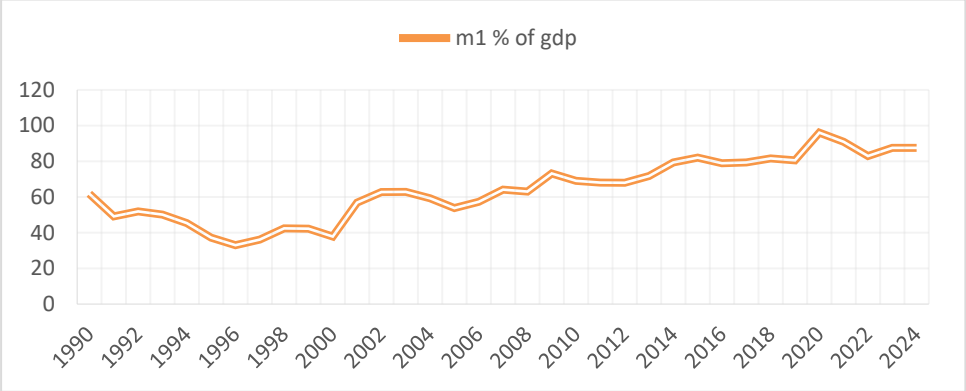


Fig. 2. M1 (% of GDP)
Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].

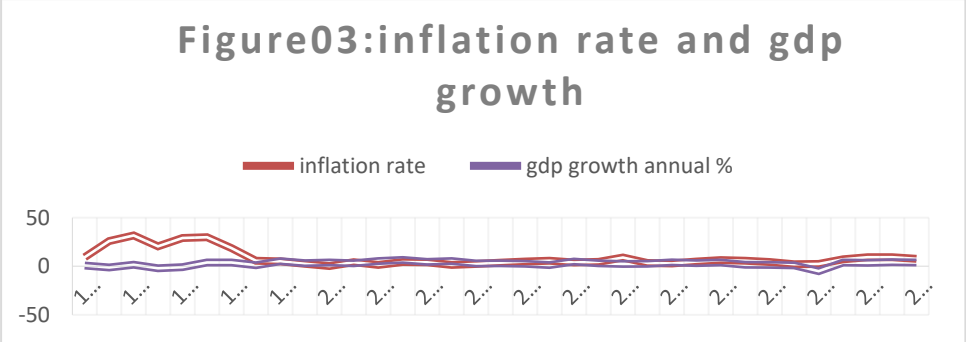


Fig. 3. Inflation rate and GDP growth.
Source: Authors' calculations using data from the International Monetary Fund (IMF) International Financial Statistics Database, accessed on [12/01/2024].

The high inflation rates during the period 1991-1997 reflected an imbalance in the economic situation in Algeria due to the launch of the new economic system in addition to the remnants of the previous socialist system. The average inflation rate during this period was 16.22% after the inflation rate declined during the period 1998-2000. However, the economic imbalance is evident in the period 1990-1997, which was characterized by high inflation rates compared to the rates of internal product development, which averaged 1.72% during the same period. (as shown in figure 03)

In the second stage (post 2000) Algeria moved on for new step to accomplish. Many reforms and challenges Especially with regard to the process of conducting monetary policy, in which the monetary and loan law 90-10 defined several amendments1 that gave broader powers to the monetary and loan Council and to the governor of the Bank of Algeria in conducting monetary policy. This stage is characterized by a continuous increase in the ratio of the monetary base to GDP, as it was known as a financial crisis due to the high prices of hydrocarbons, which are considered the largest resources of the Algerian economy. The average post-2000 period for the ratio of the development of the monetary base to internal output was 71.72%. The same stage was also marked by a gradual decline in the ratio of public debt to GDP from 53.4% in 2000 to 7.6% in

[1] One of the most important of these amendments, **Order03-11, of august 26,2003** which was as a fundamental change in the parameters of the monetary and loan law 90-10, and the most important of which was the granting of greater independence to the monetary and Loan Board and directly established a coordinating relationship between the Bank of Algeria and the government.

2008, which is a good indicator in the framework of general economic policies, and this was accompanied by several economic programs. After that, this indicator was stable between 7.6% - 8.6% until 2016, where it reached a value of 18.1%, which is explained by the results of the low oil prices crisis and the global crisis of 2008-2009, which resulted in economic stagnation and a decline in liquidity, which necessitated raising the volume of public debt to revive the economy and to ensure the continuation of the programmed development programs. The public debt ratios continued to reach a value of 55.1% in 2021, and the continued increase in this indicator can be explained by the adoption of Algeria's unconventional financing policy within the framework of the amendment of the monetary and loan law2 starting from October 2017. (as shown in figure 01 and figure 02)

Figure 03 shows clearly that during the period 2000-2007, the GDP growth rates were lower than the GDP growth rates, which is a good indicator. But during the subsequent period after 2008, inflation rates became higher than the rates of GDP growth, and this is reflected in the increase in the rates of the monetary base through figure 02

Purpose, objectives and research methods. This section is compulsory and it should provide specific description of the methodology

In this part of our study, we analyze the correlation between two variables (public debt and monetary base) using eviews.13 program. After analyzing the correlation results. We explore a simulation using a MATLAB to study the relationship between the two variables in the context of Algerian economic data.

A preliminary reading on the correlation between variables:

We started our standard study with a preliminary study of the correlation between variables through the eviews13 program to find out the extent of correlation between the study variables.

Table.1 Correlation test

	Debt % of GDP	m1 % of GDP
Debt % of GDP	**1**	///////
m1 % of GDP	**0.6335-**	**1**

Source: eviews 13 output.

Correlation results show 63.35% negative link between government gross debt and monetary base (m1) in Algeria. This means that, as multiple earlier studies have shown (negative relationship) every one-point increase in the monetary base rate in relation to GDP or the public debt to GDP is has an inverse effect of (0.6335-) on the other variable.

3-2-An ARDL approach to assess the nexus between m1 and debt on Algeria:

Through the changes made to the country's loan and monetary laws, a number of stations were identified using both study variables in order to examine the effects of the financial authority's decisions regarding the form and amount of debt required to maintain the size of Algeria's monetary base between 1990 and 2024. Furthermore, this time frame was marked by a number of shocks that took the form of different crises (the fuel price crisis in 2014, the covid-19 issue, and the 2008 crisis). The study's concept originated from the fact that Algeria's economy lacks developed financial markets on which to trade a variety of financial assets. As a result, the total payments M1, also referred to as the monetary base, are the most significant variables impacted by the financial authority's non-Ricardian fiscal policy, which is centered on printing money to pay for public debt.

[2] Article 45 of the law **17-10, of october 17, 2017** allows the Bank of Algeria to print money as part of an unconventional financing policy for a period of five years.

Using ARDL3 aproach the model on which our study was built was as follows:
m1=∫(debt)

$$\Delta m1 = \delta_0 + \sum_{i=1}^{p} \delta_{1k} \Delta m1_{t-i} + \sum_{i=1}^{q} \beta_{2k} \Delta debt_{t-i} + + \psi_1 m1_{t-1} + \psi_2 debt_{t-1} + u_t$$

m1: monetary base(percent of gdp).dependent variable.
debt: gross government debt (percent of gdp).independent variable.

The data used in this study was sourced from the World Bank. The researchers then utilized the widely-used statistical software package, Eviews 13, to estimate

the model. This approach ensures a high degree of reliability and transparency, as both the data source and the statistical analysis method are clearly identified and readily available for scrutiny.

Research results. Dickey and fuller unit root test:

To determine the degree of stability, it is first necessary to conduct a stability study of the time series of the study variables. After automatically choosing the best slow intervals(AIC: Akaike Information Criterion), we will use the Dickey Fuller test, created by test Fuller Dickey Augmented (ADF), to determine the degree of integration of the study variables. Results showed that,the debt and m1 are Integrated first-class I(1) ,so we can use ARDL to check the co-integration**.**

Table 2. dickey and fuller unit root test –level-

	level					
	intercept		Trend and intercept		none	
////////	t value	prob	t value	prob	t value	prob
Debt	-3.7730	0.0087	-0.6603	0.9682	-1.4938	0.1245
m1	-0.7654	0.8153	-3.8295	0.0278	0.3433	0.7783

Source:made by authors depending on eviews13 outputs.

Table 3. dickey and fuller unit root test -1rst difference-

	level					
	intercept		Trend and intercept		none	
////////	t value	prob	t value	prob	t value	prob
Debt	-5.4666	0.0001	-5.7840	0.0002	-5.4713	0.0000
m1	-5.6383	0.0001	-5.4554	0.0006	-5.5720	0.0000

Source:made by authors depending on eviews13 outputs.

Table 4. The degree of integration of variables

Variables	m1	debt
The degree of integration	I(1)	I(1)

Source: made by authors depending on eviews13 outputs.

[3] ARDL) model is adaptable for time series research. It handles stationarity from entirely stationary (I(0)) to integrated of order one (I(1)) and even combinations of the two. ARDL is useful for analyzing long-term variable connections, especially in small datasets. HARDLY can estimate the short- and long-term effects of independent variables on the dependent variable in the same model, which is a major benefit. This lets researchers fully analyze variable dynamics. Due to its boundary-pushing design, ARDL can be employed when standard approaches are unsuitable.

$$\Delta y_t = \delta_0 + \sum_{i=1}^{p} \delta_k \Delta y_{t-i} + \sum_{i=1}^{q} \beta_k \Delta x_{t-i} + \psi_1 y_{t-1} + \psi_2 x_{t-1} + u_t$$

Co-integration testing using the boundary approach:

Significant F-bounds test findings. The 6.67 F-statistic exceeded the threshold values at 1%, 5%, and 10% significance levels. We reject the null hypothesis and confirm a long-term link between the variables with this strong evidence. This discovery lets us examine the long-term and short-term correlations between these factors in greater depth.

Table 5. F-Bounds Test

Test Statistic			Value
F-statistic			6.6744
	10%	5%	1%
Minimum values	3.510	4.160	5.580

Source:eviews13output.

Testing the optimal slowdowns of the model:

That the Akaike Information Criterion established the model's best lag structure. This widely established statistical modeling criterion indicated 1.0 as the most efficient lag period. Figure 03 shows the model's ideal setup clearly.

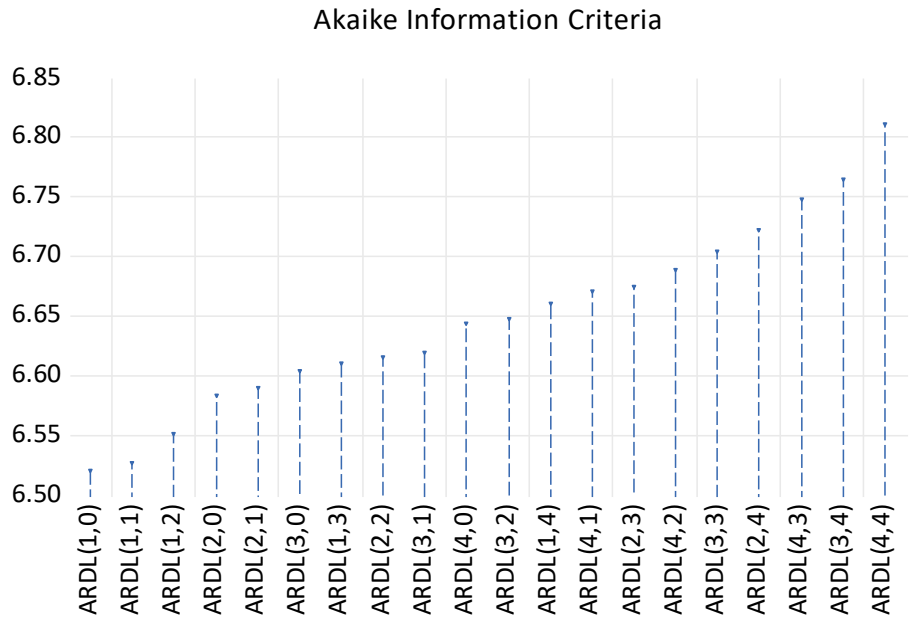


Fig.: 4: akaike information criteria
Source: eviews13outputs.

Diagnostic tests of the model :

Before adopting model findings, extensive testing is needed. Figures 05, 06, and 07 demonstrate Reviews 13 stability testing of this model. The cumulative sum (CUSUM) and CUSUM of squares tests, which assess model stability, show that residual values are inside the crucial zone at 5% significance. This indicates that the model is fundamentally solid and that short-term and long-term results are strongly correlated. Simply said the model is trustworthy and may be utilized to derive conclusions.

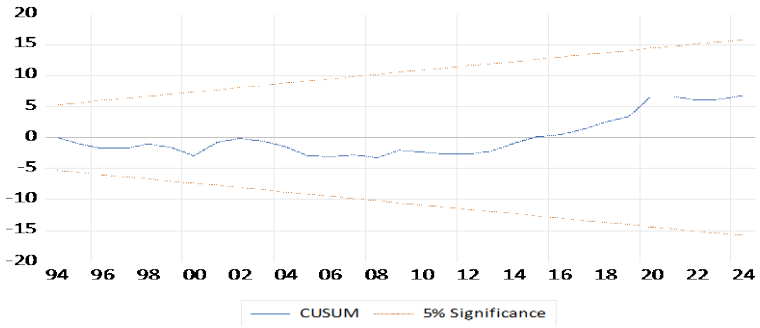


Fig.: 5: cosum test.
Source: eviews13outputs.

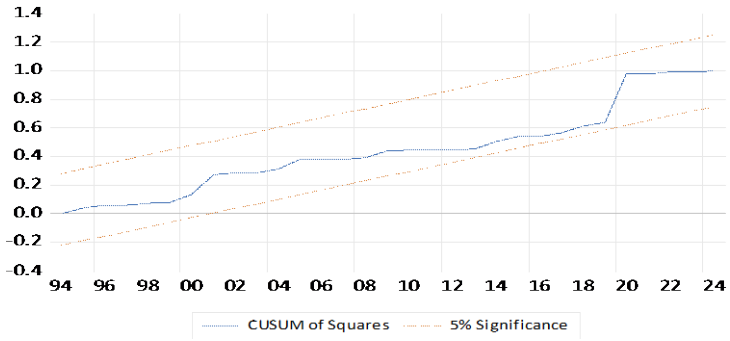


Fig.: 6:cosum of squares test.
Source: eviews13outputs.

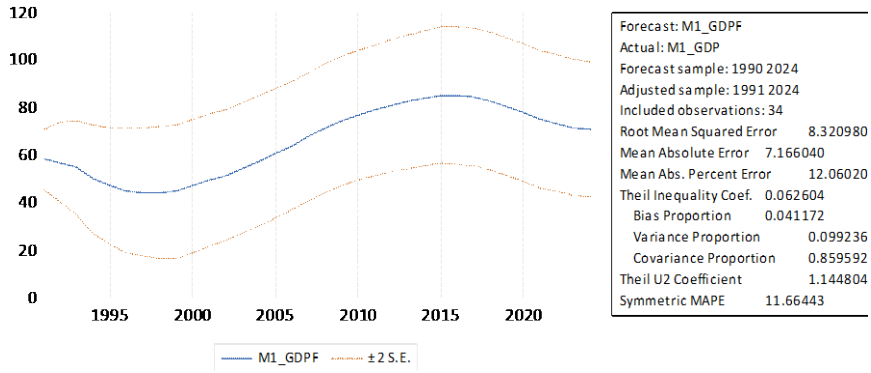


Fig.: 7: DCPIF
Source : eviews13output.

Test for the existence of the autocorrelation problem and the variance instability problem:

Table 6. Breusch-Godfrey Serial Correlation LM Test:

Null hypothesis: Homoskedasticity			
F-statistic	0.4102	Prob. F (5,25)	0.6673
Obs*R-squared	0.9354	Prob. Chi-Square (2)	0.6264

Source: eviews13 outputs

Table 3. Breusch-Godfrey test results are encouraging. The test showed no serial autocorrelation in models. The p-value of 0.6264 is considerably larger than 0.05, thus we accept

the null hypothesis. This implies model mistakes are not connected, which is necessary for good predictions.

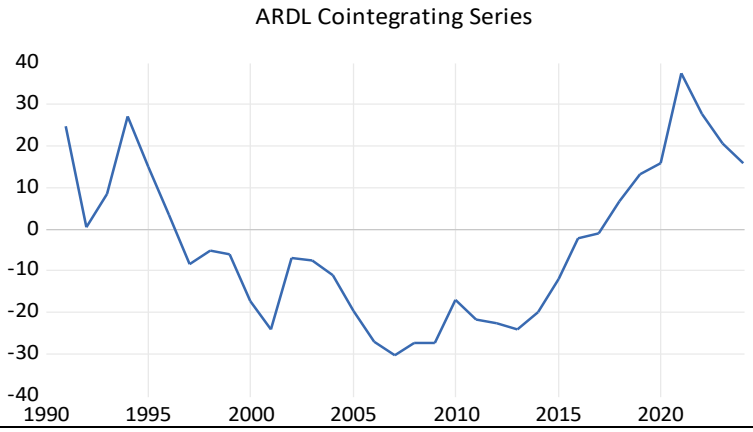
Additionally, the model passed the variance instability test, indicating that error variance remains steady across time. This is essential for model prediction accuracy.

Table 7 Heteroskedasticity Test: Breusch-Pagan-Godfrey.

Null hypothesis: Homoskedasticity			
F-statistic	0.574907	Prob. F(5,25)	0.7186
Obs*R-squared	3.196847	Prob. Chi-Square(5)	0.6697
Scaled explained SS	2.987048	Prob. Chi-Square(5)	0.7020

Source: eviews13 outputs

Heteroskedasticity Test, notably Breusch-Pagan-Godfrey, has shown model success. Since the chi-square value of 0.6697 is larger than 0.05, we accept the null hypothesis and find no heteroskedasticity (variance instability) in the model. Table 7 shows this critical discovery, verifying the model's accuracy and consistency.



Deterministics: Rest. constant
CE = M1_GDP (-1) - (-0.692632*DEBT_GDP + 96.645508)

Fig. 8. ARDL cointegration series.
Source : Eviews 13 output

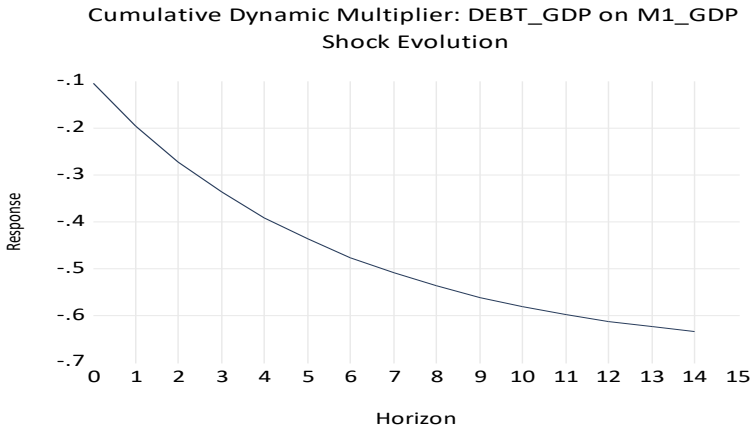


Fig. 9. Cumulative Dynamic Multiplier.
Source : Eviews 13 output

Discussion. In this part of our work, we run a simulation illustrating the link between the two variables across a horizon of 20 periods beginning from the initial year 2024, based on the findings of the ARDL emperical study. This simulation code could evaluate the model's overall fit

(measured by the R-squared value), which will indicate how well the model comprises for the Changes in M1 depending on the debt's lagged levels.

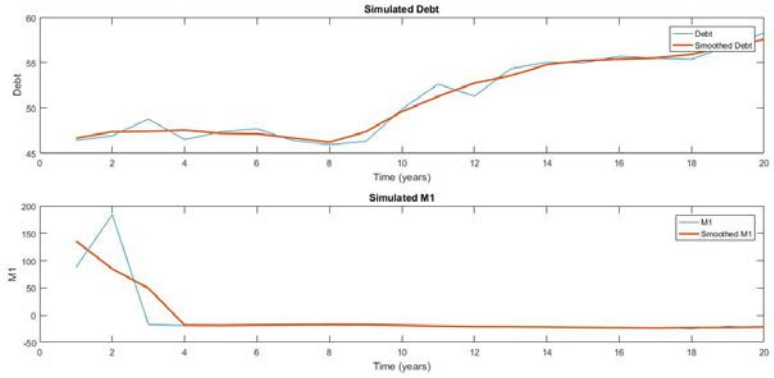


Fig. 10. simulation results.
Source: computed by authors.

The real simulated values are displayed by the observed M1 series. Depending on the lagged Debt variables, the ARDL model predicts values that are represented by the fitted M1 series. We may clearly evaluate the manner in which the model describes the dynamics of M1 through comparing these results. Furthermore, over the span of 20 period, the smoothed data aids in identifying the general patterns in M1 and Debt, and charts display any cyclical patterns or persistent rising or negative tendencies.

Conclusions. It should provide a neat summary and possible direction of future research. The checklist:

Our aim via this research document was to demonstrate the consequences of adopting a non-Ricardian fiscal policy, which is based on the amount of the national debt. Based on the Ardl approach and simulation using the Matlab program for a 20-year horizon, we examined the effects of changes in the ratio of the volume of gross public debt to the volume of GDP on a crucial variable in monetary policy represented by the monetary base. The most significant findings were as follows:

Results showed that The ARDL model coefficients show that lagged debt has a statistically significant negative effect on M1.The negative coefficient for Debt lag 1 indicates that higher Debt in the previous period is likely to have contributed to lower M1 in the current era. The coefficient (-0.692632) is significant (p-value < 0.05), indicating that Debt from the previous period has a strong negative impact on M1. A one-unit increase in Debt from the previous period results in a 0.692632 unit decrease in M1.

The non-Ricardian fiscal policy Algeria implemented, which relies on raising public debt ratios to satisfy budgetary constraints, shown in the adverse trend between the variables (m1 and government debt). This has a inverse effect on the volume of the monetary base, which is explained by the Bank of Algeria's intervention through the purchase of bonds corresponding to public debt. This reflects results of the ardl method.

As can be seen in Figure 10, the values for the simulated public debt follow the same pattern as the observed values, with a minor increase over the first eight periods and an upward trend in the debt ratios from the ninth stage until Stage 20. Regarding the relative's behavior, we have observed a progressive decline during the fi for m1 rst four stages, which coincides with a slight rise in the national debt at the same period. This illustrates the short-term effects of governmental debt on Algeria's monetary base; long-term effects are absent. The majority of these indicators accurately depict the state of the Algerian economy, which is renowned for its financial hegemony and well-coordinated overall economic policy led by the fiscal authority.

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Зв'язок між грошовою базою та державним боргом – емпіричні дані з Алжиру

Анотація. Складна взаємодія між монетарною та фіскальною політиками є вирішальною для макроекономічної стабільності, особливо в країнах, що розвиваються, таких як Алжир. Велика залежність Алжиру від доходів від нафти додає унікальний рівень складності, оскільки коливання світових цін на нафту значно впливають на державні фінанси. Це дослідження аналізує зв'язок між грошовою базою та державним боргом, що є важливим аспектом розуміння взаємодії фіскальної та монетарної політики в цьому контексті.

Постановка проблеми. Дослідження спрямоване на аналіз зв'язку між грошовою базою (M1) та державним боргом в Алжирі, досліджуючи, як цей зв'язок впливає на ефективність фіскальної та монетарної політики.

Нерозв'язані аспекти. Нерозв'язаним питанням у нашій роботі є реальна динаміка між фіскальною та монетарною політиками у сфері управління державним боргом.

Мета статті. Розуміючи цей зв'язок, дослідження прагне надати цінні висновки для політиків щодо потенційних наслідків їхніх рішень та важливості координації для досягнення довгострокової макроекономічної стабільності.

Основний матеріал. У дослідженні застосовується економетричний підхід часових рядів з використанням моделі авторегресійного розподіленого лагу (ARDL). Цей підхід дозволяє аналізувати довгострокову коінтеграцію між грошовою базою та державним боргом, використовуючи дані з 1990 по 2024 роки. Аналіз також включає симуляцію з використанням MATLAB для візуалізації зв'язку між цими двома змінними на горизонті 20 років.

Висновки. Результати аналізу ARDL вказують на статистично значущий негативний зв'язок між відставленим державним боргом та M1, що свідчить про те, що вищі рівні державного боргу в попередньому періоді призводять до зменшення грошової бази в поточному періоді. Цей результат вказує на те, що нерікардіанська фіскальна політика Алжиру, яка залежить від збільшення частки державного боргу для задоволення бюджетних обмежень, має значний вплив на грошову базу. Результати симуляції додатково ілюструють короткострокові ефекти державного боргу на грошову базу Алжиру, підкреслюючи необхідність ретельної координації між фіскальною та монетарною політиками для забезпечення довгострокової макроекономічної стабільності.

Ключові слова: *Алжир, грошова база, фіскальна політика, симуляція, державний борг.*
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