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Title of research article

The Dynamic Impact of Real Exchange Rate Movements on Domestic Savings in Algeria: An Econometric Investigation Using the ARDL Approach (1980–2023)

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Abstract

The interaction between the real exchange rate and domestic savings constitutes a critical nexus in the formulation of macroeconomic policy, particularly for emerging economies that rely heavily on external financing and exhibit structural vulnerabilities. This study empirically investigates the long- and short-run effects of real exchange rate fluctuations on domestic savings in Algeria over the period 1980–2023. Employing the Autoregressive Distributed Lag (ARDL) bounds testing approach, the analysis aims to uncover both the dynamic causal relationship and the degree of responsiveness of domestic savings to exchange rate volatility, while controlling for other macroeconomic determinants such as GDP per capita, trade balance, and money supply (M2). The econometric results confirm the existence of a statistically significant and stable long-run equilibrium relationship between the real exchange rate and domestic savings. Specifically, real exchange rate depreciation is found to exert a positive and sustained effect on domestic savings in the Algerian economy. This relationship is explained by improved export competitiveness, higher returns in tradable sectors, and increased profitability of productive enterprises, which together stimulate household and institutional savings behavior. In contrast, real appreciation reduces export earnings and discourages saving in favor of consumption. In addition, the findings reveal that GDP per capita and trade balance improvements positively influence domestic savings, while money supply expansion has a long-term negative effect, mainly through inflationary channels and higher marginal propensity to consume. The short-run dynamics, captured through the ARDL error-correction model, indicate partial adjustment of savings to exchange rate shocks, with the speed of convergence estimated at approximately 42% per annum.The study concludes that macroeconomic stability in Algeria requires a prudent and predictable exchange rate policy aligned with coherent fiscal and monetary frameworks. Policymakers are advised to adopt a managed floating exchange regime that sustains competitiveness while preventing excessive volatility. Strengthening the coordination between exchange rate management, inflation control, and financial market deepening is essential for

enhancing domestic savings mobilization, reducing external dependency, and achieving long-term economic resilience.

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1- Introduction

Domestic savings, in particular for emerging countries seeking to increase their self-financing capacity, reduce their external debt burden, and reduce their dependence on external sources, are one of the most important financial foundations for investment and long-term economic growth. High savings rates are a key determinant of economic policy stability and efficiency of financial institutions.

Economists have focused more on factors that affect domestic saving rates, such as economic factors such as inflation, interest rates, and national income; demographic factors such as the level of indebtedness; and institutional factors such as political stability and confidence in the banking system. One of the most important of these factors is the real exchange rate, which is considered to be an economic variable with direct or indirect effects on the saving behaviour of institutions and individuals, as it is closely correlated to the price level of imported goods, wages and economic competitiveness.

Questions have been raised as to whether real exchange rate depreciation policies can help to boost domestic savings in view of global economic developments and greater exchange rate flexibility in most economies. According to some hypotheses, devaluation would improve tradable industries, increase trade surpluses, and reduce demand for imports, all of which would have a beneficial effect on saving. Falling purchasing power may also cause households to save to protect themselves against future price uncertainty.

Based on these facts and in order to learn more about the link between domestic savings and the exchange rate, the study provides new information on the Algerian economy, which is highly affected by the imbalances of trade and exchange rates. In view of this, the following question is put to you:

How does the level of domestic savings in Algeria change in response to changes in the real exchange rate?

Hypothesis:
Algeria's domestic saving rate improved due to the depreciation of the real exchange rate. Relevance of the research:

This study is important in that it clarifies two important aspects of Algerian economic policy and how they influence the factors which determine the savings balance analysis. It is essential to develop more effective economic policies to tackle the fiscal and financial deficits.

Study Objective:

The aim of this study is to examine the relationship between real exchange rates and national savings in Algeria over a short period of time, based on theoretical and econometric estimates. This will help to formulate proposals that can guide policymakers to create more sustainable and efficient exchange and saving policies..

2. Theoretical frameworkand Literature Review:

This section includes empirical data derived from relevant international and regional research and an overview of the primary real classifications that have examined the impact of the exchange rate on household saving. It aims to

clarify the links examined in this context, which apply in the Algerian case, and to place the present study in the context of the existing knowledge.

2.1 Theoretical Transmission Mechanisms

Real exchange rates and household saving are linked by a series of mechanisms proposed by economic theory, which often paints a complex picture, depending on structural economic conditions.

2.1.1 The Competitiveness and Sectoral Profitability Channel

Among these studies, the most famous is the Turner Philip (1988) comparison of the US, Japan and Germany. The author examined the impact of savings and investment balances on the current account. The study looked at how governments, businesses, and consumers save and invest, and how these factors are related to real exchange rates, interest rates, and income. The findings showed that real exchange rates have a greater impact on current account volatility than interest rates and that they are inversely correlated to the household saving surplus. These findings add to the literature on global imbalances by comparing the savings-investment-fundamentals strategy with traditional foreign-trade models, where the exchange rate is central. (Turner, 1988)

Gala Paulo and Marcos Rocha (2009) used panel models using gross margin estimates to investigate the relationship between real exchange rates and household saving in several middle-income countries. The findings show that the declining real exchange rate boosts the incomes of export-producing industries, making their products more affordable and competitive on international markets. This will help increase the level of household savings. This allows investments to be made. This shows how the exchange rate can be a reliable tool to support saving and growth. (Gala & Marcos, 2009)

Presser Prereira and Luiz Carlos (2014) examined the relationship between the real exchange rate in Brazil from 1994 to 2013 and both domestic and external savings. The study found that when domestic currency is valued to finance the current account deficit, domestic savings fall, because the estimated profitability of the tradable goods sector declines, discouraging potential investors from investing in the sector. As a result, companies and individuals are forced to reallocate resources to foreign investment or consumption. As a result, domestic savings are being replaced by foreign savings. (Bresser, Luiz, Eliane, & Paulo, 2014)

2.1.2. The Redistribution Channel (Wages vs. Profits)

According to Keynesian literature, domestic saving is influenced by the real exchange rate, which affects wages and earnings as well. In the tradable goods sector, appreciation tends to result in reduced profits while real wages rise, reducing the incentive to save and increasing consumption. On the other hand, depreciation increases profit margins and reduces real wages, which boosts exports and investment and raises incomes, thereby supporting domestic savings growth. In an open economy, a real-exchange-rate depreciation increases exports and reduces consumption as a percentage of output, thereby increasing domestic saving and reducing dependence on foreign savings (Marshall-Lerner condition). The economy is moving towards consumption-led development with a current account deficit and low domestic savings when the currency is overvalued relative to its equilibrium value. (Gala & Marcos, 2009, p. 6)

2.1.3. The Consumption-Smoothing and Precautionary Saving Channel

According to Keynesian literature, domestic saving is influenced by the real exchange rate, which also has the effect of weakening the real exchange rate can reduce the real purchasing power of households by increasing import costs. This may lead to a short-term reduction in savings. But people may save to protect themselves against future income shocks if they believe the depreciation will be permanent, or if economic uncertainty increases (Keynesian stimulus). The relative strength of the effects on substitution and revenues determines the net impact. (Alexander, 1998)

Razmi, Rapetti and Skott (2012) confirm that maintaining a competitive real exchange rate is a key element in achieving long-term economic balance in developing countries. The depreciated real exchange rate helps to channel resources into productive and export sectors, encouraging capital accumulation and an increase in investment rates, rather than inflows of resources, which cause consumption booms and threaten stability at large. This system helps to achieve sustainable household savings and to reduce consumption over-indebtedness. This

explains why many emerging economies, such as China, have succeeded in using a competitive exchange rate as a tool to stimulate both growth and saving. (Razmi, Rapetti, & Skott, 2012, pp. 9-10)

According to the theory of some economists, including Presser Pereira, the appreciation of the local currency to finance the current-account deficit reduces the profitability of the tradable-goods sector, which in turn reduces domestic savings and encourages foreign savings. (Bresser, Luiz, Eliane, & Paulo, 2014)

But other scholars believe that the effect of the real exchange rate on capital accumulation may have an indirect effect on saving. The fall in the real exchange rate could be due to an increase in savings, which are then used to finance investments. This pattern is also evident in countries such as China, South Korea, Malaysia, Thailand, and Chile, which have experienced strong and sustained economic growth, but also falling real exchange rates and high savings rates. Others, such as Mexico before 1995, followed the opposite pattern, with real exchange rates rising and economic growth and savings falling. (Montiel & Luis, 2008, p. 4)

2.1.4 The Monetary and Institutional Channel

In this respect, Helpman and Razin (1984) provide a theoretical framework to explain how the international payments system affects the relationship between the national saving and the exchange rate. While the role of investment is more clearly evident in the currency system of the seller, where saving has an indirect effect through capital accumulation and investment financing, saving is directly determinant of the exchange rate in the currency system of the buyer, through its impact on relative consumption between countries. As a result, the link between household saving and the exchange rate depends on the type of monetary mechanism used in business transactions and is not absolute or linear in nature.

The researchers expressed this mathematically in two simplified forms:

a- In the seller system (S):

$$e_t = \left(\frac{Y_{F,t}}{Y_{H,t}}\right)\left(\frac{M_{H,t}}{M_{F,t}}\right)$$

The exchange rate is linked to the relative money supply (M) and the net investment-linked output (Y). This makes investment the main determinant of exchange rate movements, whereas saving effects are indirectly felt through capital accumulation..

b. In the buyer's system (B):

$$e_t = \left(\frac{C_{F,t-1}}{C_{H,t-1}}\right)\left(\frac{M_{H,t-1}}{M_{F,t-1}}\right)$$

The exchange rate is based on the relative money supply (M) and relative consumption (C), which in turn are influenced by the household savings habits. Here, the exchange rate is directly linked to household savings through relative consumption.

Savings thus directly affect the exchange rate through spending and consumption patterns. The institutional framework and monetary mechanisms governing international trade thus affect the relationship between domestic savings and the exchange rate, which are not absolute and linear.. (Helpman & Razin, 1984)

Study of Senturk and Ali. (2021) , According to the study on the effectiveness of monetary policy channels in emerging countries (Turkey, Russia, Mexico and Chile), the exchange rate channel is an important and diverse aspect of conveying the effects of monetary policy. The findings showed that Turkey has been remarkably effective in this channel, as changes in interest rates have triggered a strong exchange rate reaction, which in turn affects macroeconomic factors, including inflation and investment.

By contrast, in Russia, Mexico, and Chile, the channel was less effective, and the exchange rate response to monetary policy changes was less pronounced. Structural factors, including the type of exchange rate regime in place, the degree of economic openness, and the growth rate of financial markets in each country, are blamed for

the difference. In addition to the general weakness of the interest rate channel observed in all countries surveyed, the study also highlighted the complex relationship between the exchange rate channel and other channels. This relationship shows that in emerging economies, monetary policy effects on exchange rates are not always fully passed on to the real economy.. (Senturk & Ali, 2021)

2.2. Empirical Evidence: A Survey of Conflicting Findings

These theoretical problems are reflected in empirical research that shows that the relationship varies according to the country, time period, and methodology.

2.2.1. Evidence Supporting a Positive Effect of Depreciation

According to numerous studies, real depreciation of the exchange rate encourages savings. Gala & Rocha (2009) found in a panel of middle-income countries that a competitive real exchange rate increased the profitability of export sectors, which in turn increased savings. (Gala & Marcos, 2009). Similar to this one, Razmi and others. (2012) argued that, as the Chinese experience has shown, maintaining a depreciated real exchange rate helps emerging countries avoid consumption bubbles and channel resources to profitable investments, thus promoting sustainable saving. (Razmi, Rapetti, & Skott, 2012)

2.2.2. Evidence Supporting a Negative or Non-Linear Relationship

The relationship between the exchange rate and household saving has also been the subject of much research. The findings of these studies varied according to the statistical techniques used and the sample of countries concerned. Most showed a negative correlation between the exchange rate and domestic saving. One of the best known of these studies is the Turner Prize-winning study by Philip (1988), contrasting the US, Japan and Germany. The author examined investment and saving balances and how they influence the current account. The study looked at savings and investment by households, governments and businesses, and their relationship to income, interest rates and the real exchange rate. The findings show that the real exchange rate is negatively correlated with the domestic savings surplus and that the exchange rate has a more significant impact on current account fluctuations than the interest rate. By linking the savings-investment-equity strategy to traditional foreign-trade models in which the exchange rate is the key driver, these findings add to the body of work on global imbalances. (Turner, 1988)

Chiu Yibin and Chia-Hung (2016) examined the relationship between saving rates and real exchange rates and trade balances in 76 countries from 1975 to 2010. The study used a smoothed step-through regression model (PSTR) with instrumental variables. The investigation revealed a nonlinear association between variables. The findings apply regardless of the income level of the country, and countries with a higher saving rate than 14.8 percent can improve their trade balance by devaluing their currency or increasing their saving rate. (Chiu & Chia-Hung, 2016)

2.2.3. Evidence from Single-Country and Regional Case Studies

Chiu Yibin and Chia-Hung (2016) examined the relationship between saving rates and real exchange rates and trade balances in 76 countries from 1975 to 2010, and found that saving rates and real exchange rates were in line with each other. The study used a step-through smoothed regression model (PSTR) with instrumental variables. The investigation revealed that the variables are non-linear. These findings apply regardless of income levels, and countries with a higher saving rate than 14.8 percent can improve their trade balance by devaluing their currency or increasing their saving rate. (Bresser, Luiz, Eliane, & Paulo, 2014)

Umoru David and Oluwatoyin Tedunihaiye (2023) examined how the volatility of interest rates and the depreciation of the exchange rate affected the aggregate savings of ECOWAS countries. Using the PMG model, the authors concluded that, except for Niger, exchange rate depreciation had a negative impact on overall savings in most of the countries considered. They claimed that the reason for this was the weakness of their export industries. The study also revealed differences in the performance of the savings accounts of the group member countries as a shock absorber of interest rates. (Umoru & Oluwatoyin Dorcas, 2023)

The Elhendawy Omar study (2025) sought to examine the long-term relationship between Egyptian gross domestic savings and the exchange rate over the period 1980-22. A study using a vector error correction model (VECM) found a statistically significant negative relationship between gross domestic savings and the nominal exchange rate,

with savings declining as the Egyptian pound depreciated. The findings also showed that saving and trade conditions are positively correlated, but that fixed capital formation and the current account balance are negatively correlated. The findings underline the need to improve the conditions for trade and exchange rate stability to increase domestic savings in Egypt. (Elhendawy, 2025)

3- Derivation of the Analytical Model

To derive the relationship between the exchange rate and domestic savings, we begin with the aggregate equilibrium condition for an open economy:

Aggregate Supply = Aggregate Demand

$$OT = DT \dots\dots\dots\dots (01)$$

We have:

$$Y = C + I + G + X - M$$

$$Y - C = I + G + X - M \dots\dots \dots\dots (02)$$

We add taxes and transfers to Equation 02, finding:

$$Y - T + R - C = I + G + X - M - T + R \dots\dots\dots (03)$$

Since disposable income is the income plus transfers minus taxes, we obtain:

$$Y_d - C = I + G - T + R + X - M \dots\dots\dots\dots (04)$$

We have: Disposable Income - Consumption = Savings.
By substituting savings into Equation 04 we find:

$$S = I + G - T + R + X - M \dots\dots\dots\dots (05)$$

Given that exports and imports are affected by exchange rate fluctuations, they can be expressed by the following formulas:

$$X = (X_0 + x_1 e)$$

$$M = (M_0 + m_1 Y + m_2 e)$$

Substituting into Equation 05 we get:

$$S = I_0 + G_0 - T_0 + R_0 + (X_0 + x_1 e) - (M_0 + m_1 Y + m_2 e)$$

$$S = I_0 + G_0 - T_0 + R_0 + X_0 + x_1 e - M_0 - m_1 Y - m_2 e$$

$$S = I_0 + G_0 - T_0 + R_0 + X_0 - M_0 - m_1 Y + (x_1 - m_2)e \dots\dots\dots (06)$$

Let $A = I_0 + G_0 - T_0 + R_0 + X_0 - M_0$

Thus, Equation (06) becomes:

$$S = A - m_1 Y + (x_1 - m_2)e \dots\dots (07)$$

Y: Income

C: Consumption

I: Investment

G: Government Spending

S: Savings

e: Exchange Rate (units of domestic currency per unit of foreign currency)

X: Exports

x_1: The marginal effect of the exchange rate on exports (the slope of exports with respect to the exchange rate).

M: Imports

m_1: The marginal propensity to import (the slope of imports with respect to income).

m_2: The marginal effect of the exchange rate on imports (the slope of imports with respect to the exchange rate).

Equation (07) shows the relationship between savings (S) and the exchange rate (e). The nature of this relationship (direct or inverse) depends on the sign of the expression $(x_1 - m_2)$

A. A case of rising exchange rate:

If we take an appreciation exchange rate (e), the value of the currency will appreciate and thus demand for exports will decrease as domestic goods are now more expensive in relation to foreign goods. Conversely, demand for imports will increase as foreign goods are now cheaper in relation to domestic goods. Thus, the marginal propensity to export is negative (x1<0), while the marginal propensity to import is positive (m2>0). Thus, the value (x_1 - m_2) is negative. That is, the exchange rate and savings have an inverse relationship.

b. Case of a depreciating exchange rate:

Given depreciation of the exchange rate (e), the value of currency will decline. Demand for exports will increase because the prices of the domestic goods are lower compared to foreign goods. Demand for imports will decrease because the prices of foreign goods are higher compared to domestic goods. Therefore, the marginal propensity to export is positive (x1>0) and the marginal propensity to import is negative (m2<0). Therefore, the value (x_1 - m_2) is positive. Therefore, the relationship between savings and the exchange rate becomes directly proportional.

4- Empirical Model and Data

To empirically test this relationship, we specify the following long-run logarithmic model:

$$\boldsymbol{LnSAV = \beta\_0 + \beta\_1\, LnRER + \beta\_2\, LnGDPC + \beta\_3\, LnINF + \beta\_4\, LnTB + \beta\_5\, LnM2 + \varepsilon} \dots\dots\dots\dots (\mathbf{01})$$

SAV: Gross domestic savings (% of GDP). Source: World Bank WDI.

RER: Real effective exchange rate index (2010=100). A decrease implies depreciation. Source: Bruegel Institute/Author's calculation. Source: World Bank WDI.

GDPC: GDP per capita (constant LCU). Proxy for income. Source: World Bank WDI.

INF: Inflation, GDP deflator (annual %). Source: World Bank WDI.

TB: Trade balance (% of GDP). Source: World Bank WDI.

M2: Broad money supply (% of GDP). Source: World Bank WDI.

4.1 Statistical Description of Study Variables and Correlation Matrix:

Before beginning to estimate the study model, one must first verify the characteristics of the time series and determine whether they suffer from any standardization problems that might affect the accuracy of the results. Tables (01) and (02) represent the descriptive statistics and correlation matrix for the study variables.

Table No. (01): Statistical description of the study variables

	LNSAV	LNRER	LNGDPC	LNINF	LNTB	LNM2
Mean	3.623749	4.975216	11.99320	2.074862	0.083794	7.613042
Median	3.674275	4.751978	11.98920	2.197393	0.071995	7.867480
Maximum	4.024907	6.108842	12.17262	3.985062	0.820239	10.09950
Minimum	3.005605	4.463589	11.77419	-0.156840	-0.589229	4.538378
Std. Dev.	0.267383	0.529780	0.124135	1.098846	0.357155	1.763646
Skewness	-0.595691	1.088057	-0.128589	-0.766082	0.090673	-0.169040
Kurtosis	2.580494	2.556919	1.677969	2.683090	2.337798	1.607553
Jarque-Bera	2.924860	9.041621	3.325497	4.487918	0.864230	3.764213
Probability	0.231673	0.010880	0.189617	0.106038	0.649135	0.152269
Sum	159.4450	218.9095	527.7006	91.29392	3.686928	334.9738
Sum Sq. Dev.	3.074227	12.06867	0.662604	51.92092	5.485069	133.7493
Observations	44	44	44	44	44	44

Source: Prepared by the researcher based on Eviews12 program

As we see from Table No. (01), the mean domestic saving was 2.62 having a minimum standard deviation of 0.27, with relative stability. However, the real effective exchange rate varied greatly with a standard deviation of 0.52 and a positive slope of 1.08 as represented by the skewness coefficient with intervals of skewness. It is also noted that most of the variables are at or near the normal distribution.

Table No. (02): Correlation matrix for study variables

	LNSAV	LNRER	LNGDPC	LNINF	LNTB	LNM2
LNSAV	1					
LNRER	-0,54121	1				
LNGDPC	0,59434	-0,40374	1			
LNINF	-0,12536	0,06718	-0,52457	1		
LNTB	0,66758	-0,32174	-0,07027	0,30889	1	
LNM2	0,57109	-0,87659	0,75262	-0,35311	0,12891	1

Source: Prepared by the researcher based on Eviews12 program

From Table (02), we can see that there is a moderate negative correlation between domestic savings and the real exchange rate, which is -0.54. And a strong positive correlation between domestic savings and the GDP per capita, which is 0.59, the money supply, which is 0.57, and the trade balance, which is 0.67. While for inflation, its correlation was weak and negative, which is -0.12.

4.2 Unit Root Test for Time Series:

Table No. (03): Results of the unit root test for time series using the ADF test

At Level							
		LNSAV	**LNRER**	**LNGDPC**	**LNINF**	**LNTB**	**LNM2**
With Constant	t-Statistic	-1.4548	-1.7996	-0.6657	-3.5274	-1.6882	-2.1699
	Prob.	**0.5461**	**0.3755**	**0.8443**	**0.0118**	**0.4296**	**0.2198**
With Constant & Trend	t-Statistic	-2.1036	-1.0064	-3.9374	-3.6457	-1.6737	-0.1394
	Prob.	**0.5285**	**0.9319**	**0.0205**	**0.0378**	**0.7449**	**0.9925**
Without Constant & Trend	t-Statistic	-0.0995	-1.4127	0.8924	-1.8710	-1.6490	-0.6423
	Prob.	**0.6434**	**0.1445**	**0.8973**	**0.0591**	**0.0930**	**0.4316**
At First Difference							
		d(LNSAV)	**d(LNRER)**	**d(LNGDPC)**	**d(LNINF)**	**d(LNTB)**	**d(LNM2)**
With Constant	t-Statistic	-5.3217	-2.6323	-3.9652	-5.2205	-6.1116	-4.8827
	Prob.	**0.0001**	**0.0951**	**0.0037**	**0.0001**	**0.0000**	**0.0003**
With Constant & Trend	t-Statistic	-5.2620	-3.7679	-3.9866	-5.1194	-6.0285	-5.2902
	Prob.	**0.0006**	**0.0314**	**0.0168**	**0.0009**	**0.0001**	**0.0005**
Without Constant	t-Statistic	-5.3913	-2.3521	-3.8753	-5.2993	-6.1913	-0.5123

& Trend	Prob.	0.0000	0.0198	0.0003	0.0000	0.0000	0.4871

Source: Prepared by the researcher based on Eviews12 program

The results of the time series stationarity test, as shown in Table (03), indicate that all the variables are stationary at first difference. With the exception of inflation and per capita GDP, they were stationary at the level. This enables the use of the ARDL model, which requires the variables to be stationary at the level or first difference.

4.3 Estimation of the ARDL Model:

Table No. (04): ARDL model estimation results

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
LNSAV(-1)	0.542327	0.178436	3.039333	0.0103
LNSAV(-2)	-0.405587	0.239816	-1.691246	0.1166
LNSAV(-3)	-0.606308	0.248456	-2.440303	0.0311
LNSAV(-4)	0.503041	0.150428	3.344068	0.0058
LNRER	-0.311915	0.073155	-4.263763	0.0011
LNRER(-1)	0.216930	0.111186	1.951061	0.0748
LNRER(-2)	-0.376859	0.116085	-3.246406	0.0070
LNRER(-3)	-0.090735	0.096355	-0.941674	0.3649
LNGDPC	0.786366	0.351934	2.234414	0.0452
LNGDPC(-1)	0.843396	0.488750	1.725618	0.1100
LNGDPC(-2)	1.291367	0.541951	2.382812	0.0346
LNGDPC(-3)	-0.574664	0.506024	-1.135645	0.2783
LNINF	-0.007966	0.008782	-0.907121	0.3822
LNINF(-1)	0.011623	0.009244	1.257408	0.2325
LNINF(-2)	0.011441	0.008438	1.355872	0.2001
LNINF(-3)	-0.018428	0.007616	-2.419633	0.0323
LNINF(-4)	0.016028	0.007661	2.092112	0.0584
LNTB	0.349402	0.043582	8.017150	0.0000
LNTB(-1)	-0.321482	0.079849	-4.026112	0.0017
LNTB(-2)	0.063790	0.114862	0.555363	0.5889
LNTB(-3)	0.336398	0.112089	3.001162	0.0110
LNTB(-4)	-0.196232	0.070487	-2.783963	0.0165
LNM2	0.349626	0.151452	2.308492	0.0396
LNM2(-1)	0.122983	0.139797	0.879728	0.3963
LNM2(-2)	-0.059928	0.143738	-0.416927	0.6841
LNM2(-3)	-0.295219	0.142099	-2.077564	0.0599

LNM2(-4)	-0.275536	0.092933	-2.964882	0.0118
C	-20.92818	4.008105	-5.221464	0.0002
R-squared	**0.997405**	F-statistic		**170.7948**
Adjusted R-squared	**0.991565**	Prob(F-statistic)		**0.000000**
Durbin-Watson stat	**2.237205**			

Source: Prepared by the researcher based on Eviews12 program

The optimal ARDL model was subsequently estimated using the Akaike criterion of four maximum lags. Figure (4.3.3.4.4.4) gives the resulting model. The model was found to have high explanatory power, as the corrected coefficient of determination equaled 0.9915, which means that the independent variables explain 99.15% of the domestic savings variation. The connected probability of the Fisher statistic is less than 5%, indicating the significance of the model as a whole. Additionally, the Durbin-Watson statistic is estimated to be 2.23, which is within an acceptable range. This indicates the absence of autocorrelation in the residuals of the model. To determine the existence of a long-run relationship between the variables in question, a bound test will be carried out to test for cointegration between the variables.

4.4 Bound test:

To confirm the existence of a long-term relationship between the variables, we conducted a boundary test, and the results are shown in Table (5).

Table (5): Boundary test results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	**9.925637**	10%	2.08	**3**
		5%	2.39	**3.38**
k	5	2.5%	2.7	**3.73**
		1%	3.06	**4.15**
Actual Sample Size	40	Finite Sample: n=40		
		10%	2.306	3.353
		5%	2.734	3.92
		1%	3.657	5.256

Source: Prepared by the researcher based on Eviews12 program

We notice from Table No. (05) that the calculated F value is (9.926) which is greater than the upper critical values at all significance levels. Therefore, we conclude that there exists a joint integration relationship between the explanatory variables and the dependent variable. The long-run model is as shown in the table below:

Table No. (06): Results of estimating long-term coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNRER	-0.582063	0.096337	-6.041934	0.0001
LNGDPC	2.427729	0.225891	10.74734	0.0000
LNINF	0.013138	0.019665	0.668094	0.5167
LNTB	0.239907	0.057372	4.181599	0.0013
LNM2	-0.163549	0.035237	-4.641343	0.0006
C	-21.65297	2.087290	-10.37372	0.0000

Source: Prepared by the researcher based on Eviews12 program

From Table No. (06), the long-term equation can be written as follows:

$$\boldsymbol{LnSAV = -21.6530 - 0.5821\ LnRER + 2.4277\ LnGDPC + 0.0131\ LnINF + 0.2399\ LnTB - 0.1635\ LnM2} \quad \ldots\ldots\ldots\ldots (\mathbf{02})$$

4.5 Error Correction Model (ECM) Estimation:

It is indicated from the boundary tests that we do have a long-run relationship, and therefore we estimate the short-run model via the error correction model (ECM) and the findings are shown in the table below:

Table No. (07): ECM Error Correction Model Estimation Results

ECM Regression				
Case 2: Restricted Constant and No Trend				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LNSAV(-1))	0.508854	0.100352	5.070681	0.0003
D(LNSAV(-2))	0.103267	0.120389	0.857777	0.4078
D(LNSAV(-3))	-0.503041	0.087717	-5.734811	0.0001
D(LNRER)	-0.311915	0.047904	-6.511207	0.0000
D(LNRER(-1))	0.467595	0.061366	7.619757	0.0000
D(LNRER(-2))	0.090735	0.056241	1.613337	0.1326
D(LNGDPC)	0.786366	0.223522	3.518066	0.0042
D(LNGDPC(-1))	-0.716704	0.263829	-2.716544	0.0187
D(LNGDPC(-2))	0.574664	0.225473	2.548708	0.0255
D(LNINF)	-0.007966	0.004960	-1.605983	0.1343
D(LNINF(-1))	-0.009042	0.005679	-1.592039	0.1374

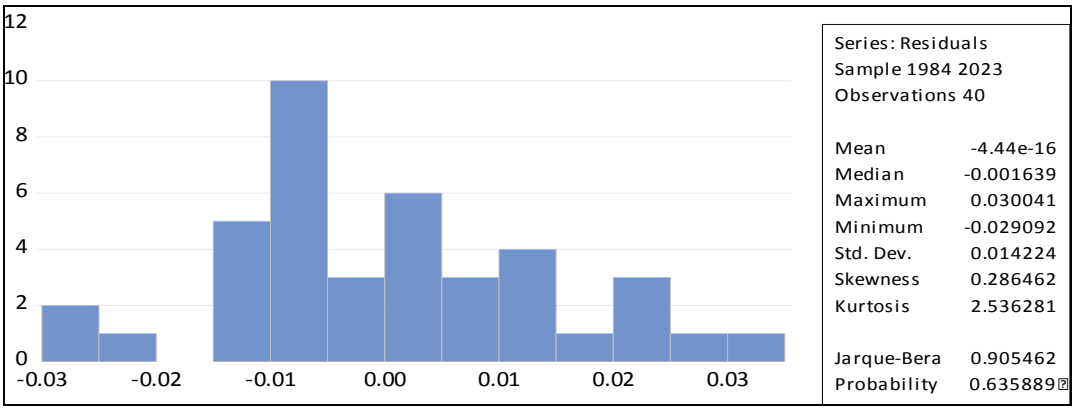
D(LNINF(-2))	0.002399	0.005208	0.460644	0.6533
D(LNINF(-3))	-0.016028	0.004706	-3.405664	0.0052
D(LNTB)	0.349402	0.023427	14.91436	0.0000
D(LNTB(-1))	-0.203956	0.049795	-4.095888	0.0015
D(LNTB(-2))	-0.140166	0.059038	-2.374182	0.0351
D(LNTB(-3))	0.196232	0.040744	4.816282	0.0004
D(LNM2)	0.349626	0.078179	4.472142	0.0008
D(LNM2(-1))	0.630683	0.094726	6.657987	0.0000
D(LNM2(-2))	0.570755	0.088447	6.453101	0.0000
D(LNM2(-3))	0.275536	0.058920	4.676435	0.0005
CointEq(-1)*	**-0.966527**	0.094676	-10.20878	**0.0000**
R-squared	**0.989098**	Mean dependent var		**0.000971**
Adjusted R-squared	**0.976378**	S.D. dependent var		**0.136224**
S.E. of regression	**0.020937**	Akaike info criterion		**-4.593132**
Sum squared resid	**0.007890**	Schwarz criterion		**-3.664248**
Log likelihood	**113.8626**	Hannan-Quinn criter.		**-4.257277**
Durbin-Watson stat	**2.237205**			

Source: Prepared by the researcher based on Eviews12 program

The error correction model (ECM) was estimated under the ARDL model (4.3.3.4.4.4). The statistical properties goodness of the model was noted. The R2 of 0.989 indicates that 98.9% of the variation in the domestic savings rate is explained by independent variables. The standard deviation of 0.0209 indicates that the model's residuals are weakly scattered. The Durbin-Watson statistic of 2.237 indicates that the residuals of the model do not experience autocorrelation issues. The error correction coefficient (CointEq(-1)) is statistically significant and negative at a significance level lower than 5% and is therefore acceptable. The result verifies a long-run relationship among the domestic savings and the rest of the variables. The coefficient suggests that 96.6% of imbalances are fixed in the following period, indicating an immediate adjustment towards equilibrium.

4.6 Model validity tests:

Figure No. (01): Results of the normal distribution test for residuals



Source: Prepared by the researcher based on Eviews12 program

Checking the normal distribution of the residuals, we get the probability corresponding to the Jarque-Bera statistic to be 0.636, which is more than 5%. Therefore, we conclude that residuals are normally distributed.

Table No. (08): Results of the autocorrelation test between the residuals

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.661387	Prob. F(2,10)	**0.5373**
Obs*R-squared	4.672968	Prob. Chi-Square(2)	**0.0967**

Source: Prepared by the researcher based on Eviews12 program

The result of the LM test was that the probability of Fisher's F statistic is estimated to be 0.5373 and Chi-Square is estimated to be 0.0967, both of which are greater than 5%; hence, we conclude that the model does not possess the problem of autocorrelation between the residuals.

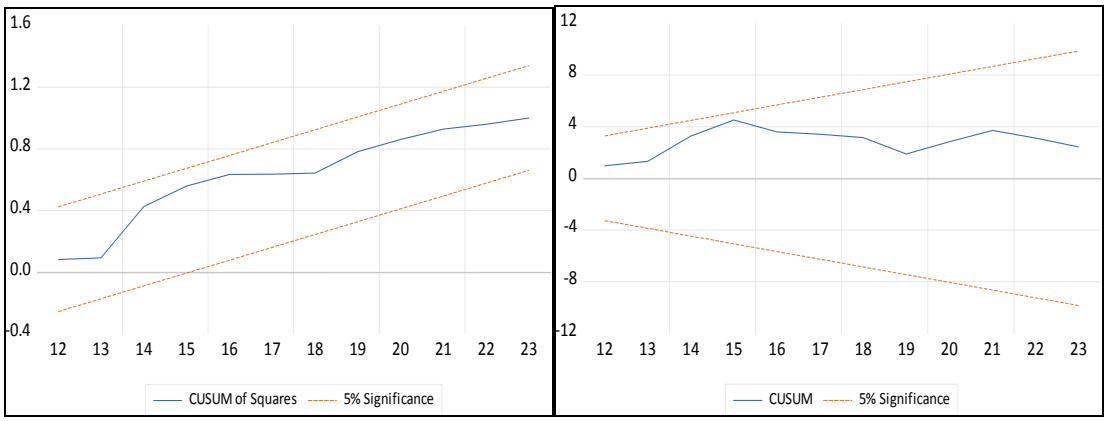
Table No. (09): Results of the variance stability test

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity			
F-statistic	0.968178	Prob. F(27,12)	**0.5511**
Obs*R-squared	27.41505	Prob. Chi-Square(27)	**0.4416**
Scaled explained SS	1.895275	Prob. Chi-Square(27)	**1.0000**

Source: Prepared by the researcher based on Eviews12 program

The result of the heteroskedasticity test reveals that the corresponding probability but based on Fisher's statistic and Chi-Square are estimated to be 0.5511 and 0.4416, respectively, which is greater than 5%; hence, we can say that the model is free from variance invariance problem.

Figure No. (02): Results of the cumulative sum of residuals test, and the cumulative sum square of residuals



Source: Prepared by the researcher based on Eviews12 program

To determine the stability of the ARDL model coefficients during the study, both the cusum and cusum of squares tests were employed. Both tests indicated that the graph was within the 5% confidence interval. This means that the model's coefficients are structurally stable over time, and there is no sign of sudden or gradual change in the model's structure over the period of the study. Therefore, the model's estimates can be relied upon to provide a sensible economic interpretation in both the short and the long term.

4.7 Interpretation of results:

1-With an impact of -0.582, the real exchange rate has a negative and significant long-term impact on household saving; a one-percent depreciation of the domestic currency leads to a saving increase of around 0.58 percent. At the first order of magnitude, a short-term negative effect of -0,311 was found. This is explained by the fact that the falling exchange rate makes domestically exported goods more competitive, thus increasing the income and profits of the manufacturing sector. As a result, individuals and institutions can be encouraged to save rather than spend.

2-Over time, GDP per head has a significant and positive effect on household saving. A 1 percent increase in per capita income boosts household saving by about 2.42 percent, according to the 2.427 impact factor. Economic theory, which views savings as a function of income, is consistent with this. The impact was erratic in the short term; the coefficient was significant and positive at 0.786 in the first meeting, but it became negative in the second meeting. This shows the unpredictable savings response to shocks or changes in consumer spending.

3- In the long run, inflation has had little effect, indicating that there is no consistent price-savings relationship. In the short run, the coefficient of -0.0160 showed how inflation, at least temporarily, can destroy people's ability to save, as it reduces the purchasing power of money and encourages consumption rather than saving.

4-Trade balance showed a significant positive long-term impact with a coefficient of 0.239. As it reflects both an increase in foreign-exchange inflows and an evolution of productive capacity, it shows that any improvement in the trade balance (increase in exports or decline in imports) will lead to a large domestic saving. The assumption that trade balances generate excess funds that support domestic savings in the short run was confirmed by the coefficient of 0.349 for the first difference.

5- In the long run, the money supply had a negative and large impact, with a coefficient of -0.1635. This means that a 1 percent increase in the money supply will result in a savings decline of about 0.16 percent. This is explained by higher consumption or inflation due to the growth of money. Conversely, the short-term effect was positive during this period, at 0.349, with a peak of 0.630. This means that the availability of liquidity temporarily supports saving, before its effects are offset by changes in prices or consumption habits.

5. Conclusion and Policy Implications

The purpose of the study was to measure the impact of real exchange rate fluctuations on the savings rate in Algeria over the period (1980-2023) using an automatic distributed error model (ARDM). The results showed that the real exchange rate and domestic savings are negatively correlated in the short and long term. This means that

the depreciation of the Algerian dinar has been responsible for raising the level of domestic savings, increasing demand for domestic production and reducing demand for foreign production. The findings thus demonstrate the validity of the hypothesis that the real exchange rate depreciation will lead to higher domestic savings levels in Algeria.

The study provides empirical evidence for policymakers to consider a more stable exchange rate policy and to link it to structural reforms that support domestic savings, as this is a key element for financing investment and raising economic growth. Research also contributes to the depth of the local economic literature by providing insight into the dynamic relationship between macroeconomic variables and saving, thus improving the effectiveness of economic policies in the context of financial instability. From what we found.

Policy Recommendations:

- Increased confidence in the banking and financial system by providing better real returns on savings and encouraging saving to be used for productive investment.
- Adoption of exchange rate stability and inflation control policies.
- Diversification of sources of national income and reduced dependency on hydrocarbons to support the trade balance.
- Controlling the supply of money and directing monetary growth into investment rather than consumption.

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The authors declare that they have **no known competing financial interests or personal relationships** that could have appeared to influence the work reported in this paper. All opinions, analyses, and conclusions expressed in this article are solely those of the authors and do not necessarily represent the official positions of their affiliated institutions.

References

1. Alexander, R. (1998). Advanced macroeconomics. *Economic Record, 74(224), 89.*

2. Bresser, P., Luiz, C., Eliane, A., & Paulo, G. (2014). An empirical study of the substitution of foreign for domestic savings in Brazil. *Economia, 15* (1), 54-67.

3. Chiu, Y., & Chia-Hung, D. (2016). The role of savings rate in exchange rate and trade imbalance nexus: Cross-countries evidence. *Economic Modelling, 52*, 1017-1025.

4. Elhendawy, E. (2025). Exchange Rate and Gross Domestic Saving Is There a Relation? Empirical Evidence from Egypt. *International journal of Economics and finance, 17* (1), 1-1.

5. Gala, P., & Marcos, R. (2009). Real exchange rates, domestic and foreign savings: the missing link. *XXXVII Encontro Nacional de Economia da ANPEC.* Foz do Iguaçu Brazil.

6. Helpman, E., & Razin, A. (1984). The role of saving and investment in exchange rate determination under alternative monetary mechanisms. *Journal of Monetary Economics, 13(3), 307-325.*

7. Moataz, a. A. (2025). The Relationship Between the Exchange Rate and the Balance of Payments Using Nonlinear. *Journal of Quantitative Economic Studies Volume: 11, Issue: 01 , pp. 103-11* , 105.

8. Montiel, P., & Luis, S. (2008). *Real exchange retes, saving and growth: Is there a link?* Working Paper No. 4636, The World Bank.

9. Mushir, &. A.-W. (2021). TThe economic determinants of saving Algerian household at the Period (1987-2019). *Horizons for Economic Studies* , Volume 6, Numéro 2, Pages 248-266.

10. Nasir, M., Ahmad, F., & Ahmad, M. (2017). Foreign direct investment, aggregate demand conditions and exchange rate nexus: A panel data analysis of BRICS economies. *Global Economy Journal, 17(1), 20160012.*

11. Razmi, A., Rapetti, M., & Skott, P. (2012). The real exchange rate and economic development. *Structural change and economic dynamics, 23(2), 151-169.*

12. Senturk, I., & Ali, A. (2021). Effectiveness of Monetary Policy Channels: Insights from Four Emerging Economies. .*Journal of Business and Economic Options, 4(3), 1-9.*

13. Turner, P. (1988). Savings and investment, exchange rates, and international imbalances: A comparison of the United States, Japan, and Germany. *Journal of the Japanese and International Economies, 2* (3), 159-285.

14. Umoru, d., & Oluwatoyin Dorcas, T. (2023). Saving in presence of volatilities in interest rate and exchange rate devaluation. *Asian Journal of Economics, business and Accounting, 23* (2), 111-128.