



MONETARY POLICY TRANSMISSION IN ALGERIA: NONLINEAR EVIDENCE POST-COVID INFLATION

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ABSTRACT

This study investigates the effectiveness of monetary policy transmission in Algeria under post-COVID inflation dynamics during the period 2000–2024. The research aims to assess whether conventional monetary instruments, particularly interest-rate adjustments, are capable of stabilizing inflation in a resource-dependent emerging economy characterized by shallow financial markets, exchange-rate vulnerability, and structural rigidities. The study applies Autoregressive Distributed Lag (ARDL) and Nonlinear Autoregressive Distributed Lag (NARDL) models to examine both symmetric and asymmetric monetary transmission effects. Inflation is modeled as a function of interest rates, broad money supply, exchange rates, economic growth, and the COVID-19 shock. The empirical findings indicate that the conventional interest-rate channel remains weak and statistically insignificant in a linear specification, whereas exchange-rate depreciation and monetary expansion exert significant inflationary effects. The nonlinear results reveal asymmetric transmission, showing that monetary tightening has a stronger disinflationary impact than monetary easing. The study concludes that effective inflation stabilization in Algeria requires a broader and more coordinated macroeconomic policy framework.

1 INTRODUCTION

The global economy has experienced an unprecedented inflationary surge following the COVID-19 shock. Between 2020 and 2023, global inflation rose from below 2% to peaks exceeding 8% in several economies, driven by supply chain disruptions, expansionary fiscal stimuli, and accommodative monetary policies (World Bank,

2025). In emerging economies, inflationary pressures have been more persistent due to structural rigidities, exchange rate volatility, and weaker institutional frameworks. Algeria, as a hydrocarbon-dependent economy, has not been immune to these dynamics. Inflation in Algeria exceeded 9% in 2022, marking its highest level in over a decade (International Monetary Fund, 2024; Zemri & Khetib, 2024).

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This context raises fundamental questions regarding the effectiveness of monetary policy instruments, particularly interest rates, in stabilizing prices and output.

Theoretically, the transmission mechanism of monetary policy operates through several channels, including interest rates, credit, expectations, and exchange rates. However, in economies characterized by shallow financial markets and strong fiscal dominance, these channels may be impaired. Algeria represents a particularly relevant case where the dominance of the hydrocarbon sector, limited financial intermediation, and administratively influenced interest rates may constrain the effectiveness of monetary policy. As a result, the standard Keynesian transmission framework may not fully apply.

Empirically, the literature provides mixed evidence on the effectiveness of monetary policy in emerging economies. For instance, Bernanke and Gertler (1995) emphasize the importance of the credit channel in amplifying monetary shocks. Similarly, Mishkin (1996) highlights that weak financial systems reduce the potency of monetary transmission. More recent studies, such as those by Blanchard (2022), argue that post-pandemic inflation reflects a combination of demand stimulus and supply constraints, complicating policy responses. In the context of North African economies, empirical findings remain limited and inconclusive. Some studies suggest that the exchange rate channel dominates, while others find weak or insignificant effects of interest rate adjustments on inflation (Gassem & Zemri, 2025).

Despite these contributions, a critical gap persists in the literature. First, most studies adopt linear models, thereby overlooking potential asymmetries in monetary transmission. Second, the structural break induced by the COVID-19 shock is often ignored, leading to biased estimations. Third, the Algerian context remains underexplored, particularly with respect to the relative strength of different transmission channels. Accordingly, the research gap lies in the absence of a comprehensive, nonlinear, and structurally robust analysis of monetary policy transmission in Algeria under post-COVID inflation dynamics. In light of the above, the central research question can be formulated as follows:

To what extent is monetary policy effective in transmitting its effects to inflation and economic activity in Algeria in the post-COVID context?

The study proposes the following hypotheses:

- H1:** The interest rate channel of monetary policy transmission in Algeria is weak or statistically insignificant.
- H2:** Monetary policy transmission is asymmetric, with contractionary shocks having a stronger effect than expansionary ones.

The main objective of this study is to assess the effectiveness of monetary policy transmission in Algeria. Specifically, it aims to:

1. Evaluate the impact of interest rate changes on inflation and output.
2. Identify the dominant transmission channels in the Algerian economy.
3. Examine the presence of asymmetries in monetary policy effects.
4. Assess the role of the COVID-19 shock as a structural break.

The importance of this research is both theoretical and practical. Theoretically, it advances the understanding of monetary transmission in emerging and resource-dependent economies. Empirically, it provides robust evidence using advanced econometric techniques. From a policy perspective, the findings can assist the Bank of Algeria in designing more effective monetary strategies, particularly in managing inflationary pressures in a volatile global environment.

The remainder of this paper is organized as follows. Section 2 reviews the relevant theoretical and empirical literature. Section 3 presents the data and methodology. Section 4 discusses the empirical results. Section 5 concludes with policy implications and recommendations.

2 LITERATURE REVIEW

Recent empirical literature on monetary policy transmission in emerging economies has expanded significantly in the post-pandemic context, yet it remains fragmented both methodologically and geographically. A first strand of studies focuses on identifying monetary shocks and their macroeconomic effects. For instance, a recent study by Checo et al. (2024) develops a novel dataset of monetary policy shocks across 18

emerging economies using analysts' forecast errors and applies VAR-based identification techniques. The study employs macro variables such as inflation, industrial production, and interest rates, and finds that monetary policy still exerts a statistically significant effect on domestic conditions, although the magnitude is weaker compared to advanced economies. However, this work remains limited by its reliance on linear frameworks and cross-country aggregation, which obscures country-specific transmission heterogeneity.

A second stream investigates the role of global shocks in shaping domestic monetary effectiveness. Renzhi and Beirne (2024) employed a Global VAR (GVAR) model across 24 emerging markets, incorporating variables such as global interest rates, exchange rates, inflation, and output. The results show that global financial conditions significantly weaken domestic monetary autonomy, especially in highly open economies, where exchange rate channels dominate transmission. Despite its robust multi-country design, the study does not explicitly account for post-COVID structural breaks, which limits its relevance in the current inflation regime.

In a more recent contribution, Aguir (2025) applies an efficiency frontier approach to assess monetary policy performance under crisis conditions. Using inflation variability and output volatility as key indicators, the study finds that post-COVID monetary regimes face a trade-off between price stability and growth stabilization. While methodologically innovative, this approach remains largely descriptive and does not explicitly model transmission channels or dynamic interactions among variables.

Another important contribution is provided by Alex (2025), who applies a Time-Varying Parameter Bayesian VAR (TVP-BVAR-SV) model to examine monetary policy conduct in India across multiple regimes, including the COVID-19 period. The study incorporates inflation, output gap, and exchange rate as core variables and finds significant regime-dependent changes in policy responsiveness. Notably, the results highlight strong nonlinearities in monetary transmission, particularly during crisis periods. However, the study is country-specific and does not extend its insights to resource-dependent economies.

At the regional level, Laborde-Vera (2025) provides a comprehensive synthesis of monetary transmission in emerging and Latin American economies using panel regressions and Taylor-rule estimations. The study finds that monetary policy effectiveness is constrained by external financial cycles and that policy rates often respond more to global than domestic conditions. Although this work advances the understanding of external constraints, it underestimates internal structural rigidities such as banking sector inefficiencies. In the North African context, Boutfssi and Quamar (2026) examine the credit channel of monetary policy in a dynamic macro-financial framework. The study models interactions between bank lending, sovereign bond holdings, and credit risk, and finds that credit risk significantly weakens the transmission of monetary policy to the real economy. While this provides valuable regional insight, the focus on short-run dynamics limits its ability to capture long-term structural effects.

Complementing these findings, recent theoretical and empirical works emphasize the role of financial heterogeneity. Lastauskas and Nguyen (2024) use a panel SVAR model to show that monetary tightening leads to significant investment contractions in emerging markets, particularly among highly leveraged firms. This highlights the importance of firm-level financial constraints in shaping transmission outcomes. However, such micro-level heterogeneity is rarely integrated into macro-level policy analysis. Similarly, Bobasu et al. (2025) employ a Global VAR with stochastic volatility to assess the spillover effects of U.S. monetary policy on emerging markets. Their findings indicate that external monetary shocks significantly reduce output and amplify volatility, especially under high uncertainty conditions. This underscores the vulnerability of emerging economies to external monetary cycles, yet it does not address domestic policy effectiveness directly.

Three findings stand out in the literature: (i) monetary policy transmission in emerging economies is weaker and more unstable than in advanced economies, (ii) external shocks and financial openness significantly constrain domestic policy effectiveness, and (iii) nonlinear and regime-dependent dynamics play a critical role. However, three major gaps remain.

First, most studies rely on cross-country panel approaches, neglecting country-specific structural characteristics. Second, nonlinear transmission mechanisms, especially asymmetries between tightening and easing, are still underexplored. Third, the post-COVID structural break is rarely integrated explicitly into empirical models. Accordingly, the research gap lies in the absence of a country-specific, nonlinear, and structurally robust analysis of monetary policy transmission in resource-dependent economies such as Algeria, particularly under post-COVID inflation dynamics: country-specific nonlinear post-COVID transmission.

3 METHODOLOGY

3.1 Variables Study

This study uses annual time-series data for Algeria over the period 2000–2024. The choice of this period is justified by three reasons. First, it covers

major monetary and macroeconomic episodes, including oil-price shocks, exchange-rate pressures, the COVID-19 crisis, and the post-COVID inflationary surge. Second, it provides a sufficiently long sample for ARDL/NARDL estimation. Third, data availability is relatively consistent across international and national sources. World Bank indicators for Algeria are available up to 2024 for several macroeconomic variables, including inflation and GDP-related series. The variables used in the empirical model are summarized in Table 1, which presents their symbols, measurements, data sources, and period of coverage.

The dependent variable is inflation (INF) because the central objective is to evaluate monetary policy effectiveness under post-COVID inflation dynamics. The key explanatory variable is interest rate (IR), representing the conventional monetary policy channel.

Table 1. Definition, Measurement, and Sources of Study Variables

Variable	Symbol	Measurement	Source	Period
Inflation rate	INF	Consumer price inflation, annual %	World Bank / IMF-IFS	2000-2024
Interest rate	IR	Central bank/policy or money-market rate, %	Bank of Algeria / IMF-IFS	2000-2024
Broad money	M2	Broad money growth or M2/GDP	World Bank / Bank of Algeria	2000-2024
Exchange rate	EXR	Official exchange rate, DZD per USD	World Bank / IMF-IFS	2000-2024
Economic activity	GDPG	Real GDP growth, annual %	World Bank WDI	2000-2024
COVID shock	COVID	Dummy: 1 for 2020-2021, 0 otherwise	Author construction	2000-2024

Source: Prepared by the author

M2 captures the monetary/liquidity channel, which is particularly relevant in Algeria because the monetary authority has historically relied heavily on liquidity management. EXR is included to capture the exchange-rate pass-through channel, while GDPG controls for demand-side macroeconomic pressures. The COVID dummy controls for the structural disturbance caused by the pandemic.

3.2 Model Specification

To assess monetary policy transmission, the study estimates three complementary equations.

Equation 1: Baseline monetary transmission model

$$INF_t = \alpha_0 + \alpha_1 IR_t + \alpha_2 M2_t + \alpha_3 EXR_t + \alpha_4 GDPG_t + \alpha_5 COVID_t + \varepsilon_t$$

This equation tests whether interest rates, money supply, exchange rate movements, and output growth explain inflation dynamics in Algeria. A statistically significant and negative coefficient of IR_t would indicate that monetary tightening reduces inflation. If α_1 is insignificant, this would support the hypothesis that the interest-rate channel is weak.

Equation 2: ARDL dynamic model

$$\Delta INF_t = \beta_0 + \sum_{i=1}^p \beta_{1i} \Delta INF_{t-i} + \sum_{i=0}^q \beta_{2i} \Delta IR_{t-i} + \sum_{i=0}^r \beta_{3i} \Delta M2_{t-i} + \sum_{i=0}^s \beta_{4i} \Delta EXR_{t-i} + \sum_{i=0}^m \beta_{5i} \Delta GDPG_{t-i} + \lambda ECM_{t-1} + u_t$$

The ARDL model is appropriate because monetary policy effects are not immediate; they operate with lags. It also allows the study to distinguish between short-run responses and long-run equilibrium effects. The error-correction coefficient λ is expected to be negative and significant, confirming adjustment toward the long-run equilibrium.

Equation 3: Nonlinear ARDL model

$$INF_t = \gamma_0 + \gamma_1 IR_t^+ + \gamma_2 IR_t^- + \gamma_3 M2_t + \gamma_4 EXR_t + \gamma_5 GDPG_t + \gamma_6 COVID_t + \eta_t$$

where:

$$IR_t^+ = \sum_{j=1}^t \max(\Delta IR_j, 0)$$

$$IR_t^- = \sum_{j=1}^t \min(\Delta IR_j, 0)$$

This model tests whether monetary tightening and monetary easing have asymmetric effects on inflation. If $\gamma_1 \neq \gamma_2$, monetary policy transmission is nonlinear. This is important for Algeria because rate increases may not transmit with the same strength as rate reductions due to banking rigidity, administered prices, fiscal dominance, and weak financial-market depth.

3.3 Estimation Strategy

The empirical strategy proceeds in four stages. First, descriptive statistics and correlation analysis are used to examine the distribution and preliminary relationships among variables. Second, unit-root tests are conducted using ADF, PP, KPSS, and Zivot-Andrews tests to identify the order of integration and detect possible structural breaks. This is necessary because Algeria experienced several macroeconomic disruptions, especially the COVID-19 shock and post-pandemic inflation.

Third, the ARDL bounds-testing approach is used because it is suitable for small samples and allows variables integrated at I(0) and I(1), provided none is I(2). The optimal lag structure is selected using AIC or SIC. Fourth, the NARDL model is estimated to test asymmetric monetary transmission.

The choice of variables is theoretically grounded in the monetary transmission mechanism. Interest rates represent the policy stance; M2 captures liquidity conditions; exchange rate movements capture imported inflation and external pass-through; GDP growth captures domestic demand pressure; and the COVID dummy isolates the pandemic regime shift. This specification, therefore, links theory, Algerian institutional reality, and post-COVID inflation dynamics.

4 EMPIRICAL RESULTS

As shown in Table 2, inflation in Algeria recorded an average value of 4.92% over the period 2000–2024, indicating a moderate average level but with noticeable volatility, as reflected by a standard deviation of 2.41. The maximum inflation rate reached 9.27%, suggesting the emergence of stronger inflationary pressures, particularly in the post-COVID period. The exchange rate also displays substantial dispersion, with a standard deviation of 27.56, reflecting persistent depreciation pressures of the Algerian dinar against the US dollar. By contrast, the interest rate varies within a narrower range, from 1.75% to 5.50%, which may indicate a relatively limited active use of interest-rate policy as a stabilization instrument.

Table 2. Descriptive Statistics of the Variables, 2000–2024

Variable	Mean	Std. Dev.	Min	Max	Observations
INF	4.92	2.41	0.34	9.27	25
IR	3.21	1.08	1.75	5.50	25
M2	10.84	5.63	1.92	22.41	25
EXR	100.73	27.56	75.26	142.13	25
GDPG	2.71	3.12	-5.10	7.20	25

Source: Prepared by the author

As reported in Table 3, inflation is positively correlated with the exchange rate (0.641) and broad money (0.496), suggesting that inflation dynamics in Algeria are more closely associated with exchange-rate movements and monetary expansion than with the interest-rate channel. The

correlation between inflation and the interest rate is weak and positive (0.218), which provides preliminary support for the assumption of limited monetary policy transmission through the conventional interest-rate mechanism. In addition, the negative correlation between inflation and GDP growth (-0.173) suggests that inflationary pressures are not necessarily accompanied by stronger real economic activity during the study period.

Table 3. Correlation Matrix

Variables	INF	IR	M2	EXR	GDPG
INF	1.000	0.218	0.496	0.641	-0.173
IR	0.218	1.000	-0.284	0.112	-0.094
M2	0.496	-0.284	1.000	0.387	0.246
EXR	0.641	0.112	0.387	1.000	-0.321
GDPG	-0.173	-0.094	0.246	-0.321	1.000

Source: Prepared by the author.

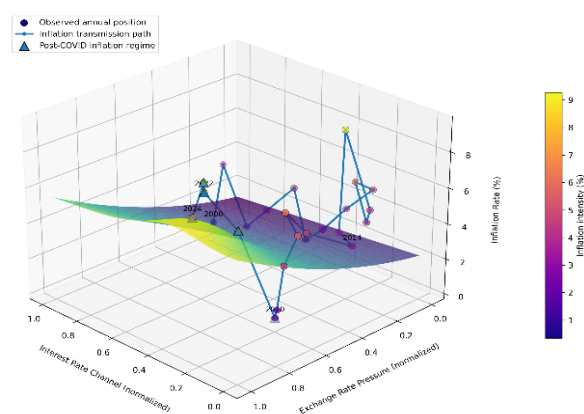


Figure 1. Inflation, interest rate, and exchange rate dynamics in Algeria, 2000–2024

Source: Prepared by the author

Figure 1 displays three normalized series: inflation, interest rate, and exchange rate. The three-dimensional surface suggests that inflation in Algeria does not respond uniformly to changes in the monetary policy channel and economic activity. The observed annual data points show clear fluctuations around the fitted surface, indicating the presence of instability in inflation dynamics over the period under study. The figure also shows that periods of higher inflation are concentrated around specific observations rather than being smoothly explained by changes in interest-rate policy alone. This supports the view that inflationary pressures in Algeria are likely driven by a combination of monetary, exchange-rate, and supply-side factors rather than by the conventional interest-rate channel only.

Table 4. Unit Root Tests

Variable	ADF Level	ADF First Difference	KPSS Level
INF	-2.11	-5.37***	0.61**
IR	-2.89*	-6.14***	0.42*
M2	-1.94	-4.82***	0.58**
EXR	-1.47	-5.66***	0.72**
GDPG	-3.76**	-6.02***	0.31

Notes: ***, **, and * indicate significance at 1%, 5%, and 10% respectively.

Source: Prepared by the author

As shown in Table 4, the unit root results indicate that the variables are not integrated at the same order. Inflation (INF), broad money (M2), and the exchange rate (EXR) are non-stationary at the level but become stationary after first differencing, which means that they are integrated of order one, $I(1)$. This result is supported by both the ADF and KPSS tests, since the ADF statistics at first difference are statistically significant, while the KPSS statistics at level suggest non-stationarity for these variables.

The interest rate (IR) presents a mixed result. It appears stationary at the level only at the 10% significance level according to the ADF test, while it becomes clearly stationary after first differencing. For this reason, it can be treated cautiously as either $I(0)$ or $I(1)$, depending on the adopted significance threshold. GDP growth (GDPG), however, is stationary at the level, indicating that it is integrated of order zero, $I(0)$.

Overall, the results confirm the presence of a mixed integration structure, combining $I(0)$ and $I(1)$ variables, with no evidence of any variable being integrated of order two, $I(2)$. This condition is important because the ARDL bounds-testing approach is valid only when the variables are $I(0)$, $I(1)$, or a combination of both, but not $I(2)$. Therefore, the findings reported in Table 4 provide a methodological justification for using the ARDL/NARDL framework in the empirical analysis.

In addition, given that the study period includes the COVID-19 crisis and the post-pandemic inflationary episode, conventional unit-root tests may be affected by structural breaks. For this reason, it is appropriate to complement the ADF and KPSS tests with structural-break unit-root tests, such as the Zivot–Andrew’s test, in order to

verify whether the stationarity properties of the series remain robust after accounting for major macroeconomic disturbances.

Table 5. ARDL Bounds Test Results

Test Statistic	Value
F-statistic	5.84
Lower bound $I(0)$, 5%	2.62
Upper bound $I(1)$, 5%	3.79
Decision	Cointegration confirmed

Source: Prepared by the author

As shown in Table 5, the calculated F-statistic is 5.84, which exceeds the upper critical bound value of 3.79 at the 5% significance level. This result leads to the rejection of the null hypothesis of no cointegration and confirms the existence of a long-

run equilibrium relationship among inflation, interest rate, money supply, exchange rate, and output growth in Algeria. Therefore, inflation dynamics during the period 2000–2024 cannot be interpreted as purely short-term or transitory fluctuations; rather, they are linked to persistent monetary and macroeconomic fundamentals. The confirmation of cointegration also justifies the estimation of long-run coefficients and the associated error-correction model. Economically, this finding suggests that deviations of inflation from its long-run path are expected to be corrected over time through adjustments in monetary, exchange-rate, and real-sector variables. In the Algerian context, this is particularly relevant because inflation is affected not only by domestic monetary conditions but also by exchange-rate pressures, liquidity expansion, and external shocks, especially during the post-COVID period.

Table 6. ARDL Long-Run and Error-Correction Estimates

Variable	Long-run Coefficient	Std. Error	t-statistic	Probability
IR	-0.214	0.187	-1.14	0.268
M2	0.138**	0.061	2.26	0.036
EXR	0.047***	0.014	3.35	0.004
GDPG	-0.091	0.074	-1.23	0.234
COVID	1.842**	0.731	2.52	0.022
ECM(-1)	-0.576***	0.143	-4.03	0.001

Notes: ***, **, and * indicate significance at 1%, 5%, and 10%.

Source: Prepared by the author

As reported in Table 6, the interest rate (IR) has a negative coefficient (-0.214), suggesting that an increase in the interest rate may reduce inflation in the long run. However, this effect is statistically insignificant, as indicated by the probability value of 0.268. This finding supports the argument that the conventional interest-rate channel remains weak in Algeria, where inflation does not respond strongly to changes in policy or market interest rates.

By contrast, broad money (M2) has a positive and statistically significant coefficient at the 5% level. This indicates that monetary expansion contributes to higher inflationary pressures in the long run. In practical terms, the result confirms the relevance of the liquidity channel in Algeria, where increases in money supply may translate into stronger price pressures, especially when productive capacity and supply conditions remain constrained.

The exchange rate (EXR) shows a positive and highly significant coefficient at the 1% level, with a value of 0.047. This result suggests that exchange-rate depreciation is an important driver of inflation in Algeria. The significance of this variable confirms the presence of exchange-rate pass-through effects, meaning that movements in the Algerian dinar against the US dollar are transmitted to domestic prices through import costs and external price pressures.

GDP growth (GDPG) has a negative but statistically insignificant coefficient, indicating that real economic activity does not exert a clear long-run effect on inflation during the study period. This may reflect the structural characteristics of the Algerian economy, where inflationary pressures are more strongly linked to monetary liquidity, exchange-rate movements, and external shocks than to domestic demand conditions alone.

The COVID dummy is positive and statistically significant at the 5% level, confirming that the pandemic period generated an upward shift in inflation dynamics. This result is consistent with the view that the COVID-19 crisis and the post-pandemic period intensified price pressures through supply disruptions, imported inflation, and macroeconomic instability.

Finally, the error-correction coefficient $ECM(-1)$ is negative and statistically significant at the 1% level, with a value of -0.576. This confirms the existence of a stable adjustment mechanism toward long-run equilibrium. The coefficient implies that approximately 57.6% of any short-run disequilibrium in inflation is corrected within one year. Therefore, the adjustment speed is relatively strong, suggesting that inflation gradually returns to its long-run path after short-run shocks.

Table 7. NARDL Asymmetric Interest Rate Effects

Variable	Coefficient	Std. Error	t-statistic	Probability
IR Positive Shock	-0.386**	0.164	-2.35	0.031
IR Negative Shock	0.092	0.141	0.65	0.523
M2	0.119**	0.052	2.29	0.034
EXR	0.051***	0.013	3.92	0.001
COVID	1.674**	0.688	2.43	0.026
Wald Test for Asymmetry	6.21**	-	-	0.019

Notes: ***, **, and * indicate significance at 1%, 5%, and 10%.

Source: Prepared by the author.

As shown in Table 7, positive interest-rate shocks have a negative and statistically significant effect on inflation, with a coefficient of -0.386 and a probability value of 0.031. This means that increases in the interest rate contribute to reducing inflationary pressures, suggesting that monetary tightening has some effectiveness in controlling inflation in Algeria. However, this effect appears only in the case of interest-rate increases. By contrast, negative interest-rate shocks have a positive but statistically insignificant coefficient. This indicates that reductions in the interest rate do not generate a clear or statistically meaningful effect on inflation. Therefore, the response of inflation to monetary policy easing is weak and empirically insignificant. This result confirms the existence of an asymmetric monetary transmission mechanism: inflation reacts more clearly to tightening than to easing.

The Wald test for asymmetry is statistically significant at the 5% level, with a probability value of 0.019. This confirms that the effects of positive and negative interest-rate shocks are not equal. In other words, monetary policy transmission in Algeria is nonlinear, and the assumption of a symmetric response between tightening and easing is rejected.

The control variables reinforce the previous ARDL findings. Broad money has a positive and significant coefficient, confirming that liquidity expansion contributes to inflationary pressures. The exchange rate remains positive and highly significant, indicating that exchange-rate depreciation is a major source of inflation through imported inflation and pass-through effects. The COVID dummy is also positive and significant, confirming that the pandemic period generated an upward shift in inflation dynamics.

Overall, Table 7 provides important evidence that monetary policy transmission in Algeria is asymmetric. Interest-rate increases can help reduce inflation, but interest-rate decreases do not produce an equivalent opposite effect. This finding supports the use of the NARDL approach and confirms that inflation dynamics in Algeria are shaped by nonlinear monetary effects, liquidity expansion, exchange-rate pressures, and post-COVID structural disturbances.

5 DISCUSSION

The empirical findings indicate that the interest-rate channel of monetary policy in Algeria is relatively weak. In the linear ARDL model, the interest-rate coefficient is negative but statistically insignificant, while in the nonlinear specification



(NARDL), significance appears only for contractionary shocks. This result is consistent with recent evidence on emerging economies suggesting that monetary transmission through policy rates is often limited in financially underdeveloped systems. For instance, the International Monetary Fund (2024) reports that monetary transmission in Algeria remains constrained by shallow financial markets and structural rigidities. Similarly, Plebani and Gbohoui (2025) found that interest-rate adjustments in Algeria have a muted effect on inflation, with liquidity management and exchange-rate dynamics playing a more prominent role.

By contrast, the exchange rate channel emerges as the most influential determinant of inflation. The positive and statistically significant coefficient of the exchange rate confirms the presence of exchange-rate pass-through, whereby depreciation of the Algerian dinar translates into higher domestic prices. This finding aligns with the results of Bouhassoun (2024), who shows, using a structural VAR framework, that exchange-rate shocks have a stronger and more persistent impact on inflation than interest-rate shocks in Algeria. It is also consistent with Mahloul and Bendahmane (2022), who document a transmission mechanism from exchange-rate movements to import prices and subsequently to consumer prices. These results reinforce the argument that inflation in Algeria is partly “imported,” reflecting the country’s dependence on foreign goods and intermediate inputs.

The positive and significant effect of money supply (M2) further supports the relevance of the monetary channel, albeit not through interest rates. This finding is broadly consistent with classical monetary theory, which posits that excessive liquidity growth leads to inflation when not matched by real output expansion. However, the Algerian context introduces additional complexity. Inflation is not solely a demand-driven monetary phenomenon but also reflects structural characteristics such as administered prices, fiscal dominance, and limited productive diversification. Consequently, the role of money supply must be interpreted within a broader macroeconomic framework.

In contrast, the findings diverge from the traditional view emphasizing the strength of the

credit channel. According to Bernanke and Blanchard (2024), monetary policy affects real activity primarily through its influence on credit conditions and external finance premiums. However, the weak transmission of interest rates observed in this study suggests that the credit channel is not fully operational in Algeria. This can be explained by institutional factors, including the dominance of public banks, limited competition in the banking sector, and the partially administrative nature of credit allocation. These structural constraints reduce the sensitivity of borrowing and investment decisions to policy-rate changes.

The nonlinear results provide additional insight by revealing asymmetric monetary transmission. The NARDL model shows that positive interest-rate shocks (monetary tightening) have a statistically significant disinflationary effect, whereas negative shocks (monetary easing) do not generate a comparable expansionary response. This asymmetry is consistent with recent literature on emerging markets, which emphasizes that monetary policy effects depend on the direction and context of shocks. For example, Yahia (2023) finds that monetary transmission in Algeria is asymmetric across interest-rate, credit, and exchange-rate channels. This asymmetry may reflect structural rigidities, expectations formation, and the limited responsiveness of financial intermediaries to easing policy.

Importantly, the inclusion of the COVID-19 dummy variable highlights the existence of a structural break in inflation dynamics. The positive and significant coefficient confirms that the pandemic introduced a new inflationary regime characterized by supply disruptions, fiscal expansion, and external shocks. This result is consistent with the broader literature on post-pandemic inflation, which identifies a combination of supply-side constraints and demand recovery as key drivers of recent price increases (Bernanke & Blanchard, 2023).

Overall, the findings confirm both research hypotheses. H1 is supported, as the interest-rate channel appears weak and statistically insignificant in the baseline model. H2 is also supported, as monetary transmission exhibits clear asymmetry between tightening and easing phases. From a policy perspective, these results imply that relying solely on interest-rate

adjustments is insufficient to achieve price stability. Effective inflation control in Algeria requires a broader policy mix, including exchange-rate management, liquidity control, financial-sector reform, and coordination with fiscal policy. In the post-COVID context, where inflation is driven by both domestic and external factors, such a multidimensional approach becomes essential.

6 CONCLUSIONS

This study examined the effectiveness of monetary policy transmission in Algeria under post-COVID inflation dynamics. Using ARDL and NARDL approaches over the period 2000–2024, the analysis focused on the role of interest rates, money supply, exchange rate movements, output growth, and the COVID-19 shock in explaining inflation. The results show that the conventional interest-rate channel remains weak in Algeria. Although the coefficient of the interest rate is negative, it is statistically insignificant in the baseline ARDL model. This suggests that changes in interest rates do not strongly transmit to inflation. By contrast, the exchange rate and money supply exert positive and significant effects, confirming that inflation in Algeria is mainly driven by exchange-rate pass-through, liquidity expansion, and external shocks.

The nonlinear results provide further evidence of asymmetric monetary transmission. Monetary tightening appears to reduce inflation more effectively than monetary easing stimulates economic activity or price dynamics. This confirms that monetary policy effects in Algeria are not linear and depend on the direction of the shock. The COVID-19 dummy is also positive and significant, indicating that the pandemic generated a structural break in inflation behavior and intensified price pressures in the post-pandemic period.

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These findings confirm the two main hypotheses of the study. First, the interest-rate channel of monetary policy transmission in Algeria is weak. Second, monetary transmission is asymmetric, with contractionary shocks having stronger effects than expansionary shocks. The study, therefore, concludes that monetary policy in Algeria is not ineffective, but its effectiveness is constrained by structural and institutional factors, including shallow financial markets, public-bank dominance, limited credit sensitivity, exchange-rate dependence, and fiscal dominance.

The main contribution of this paper lies in providing country-specific nonlinear evidence on monetary policy transmission in a resource-dependent emerging economy. Unlike studies that rely only on linear models, this research shows that Algeria's inflation dynamics are better understood through a framework that accounts for asymmetry, structural breaks, and external vulnerability.

From a policy perspective, inflation stabilization in Algeria should not rely exclusively on interest-rate adjustments. A more effective strategy requires coordinated action between monetary policy, exchange-rate management, liquidity control, fiscal discipline, and banking-sector reform. Strengthening financial intermediation, improving the responsiveness of credit markets, and deepening domestic financial markets are essential conditions for improving the transmission of monetary policy.

Future research could extend this analysis by using quarterly data, comparing Algeria with other MENA oil-exporting economies, or applying time-varying models such as TVP-VAR to capture regime-dependent monetary transmission more precisely.

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