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The Asymmetric Exchange Rate Fluctuations' Impact on Inflation in Algeria: An Econometric Analytical Study Using the VAR Model Methodology for the Period 1990–2023

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Abstract:
This study aims to analyze and measure the impact of asymmetric exchange rate fluctuations on inflation in Algeria during the period 1990–2023 by formulating and employing the Vector Autoregression (VAR) model. The data was collected from the World Bank database and the Bank of Algeria.

The findings, based on the VAR model test, indicate an inverse relationship between inflation and the exchange rate, with approximately 74% of inflation variations attributed to its past values and exchange rate fluctuations in Algeria during the study period. Through shock analysis and impulse response functions, the study concludes that exchange rate fluctuations in Algeria have a more pronounced positive effect on inflation in the short term, whereas in the long term, the effect turns negative.

Keywords: Exchange Rate; Inflation; Vector Autoregression (VAR) Model; Algerian Economy.

INTRODUCTION

International finance has undergone significant development and profound transformations, particularly in the 1970s. These changes have been especially pronounced in the realm of exchange rates, which play a crucial role both domestically and internationally. The exchange rate is a highly sensitive economic variable, influenced by both internal and external factors, particularly in light of developments in international trade rates and the evolution of global financial markets.

Economic theories and the majority of empirical studies suggest a causal relationship from exchange rates to inflation. This relationship can be better understood through the transmission channels of monetary policy, among which the exchange rate channel is particularly significant. Many countries, especially developed ones, rely on this channel to maintain monetary stability and preserve currency equilibrium.

Inflation is one of the most prevalent economic phenomena affecting countries regardless of their level of development. It is one of the most frequently studied economic concepts due to its complex, multifaceted nature. Inflation generates numerous challenges, including the erosion of individuals' purchasing power, which in turn leads to wealth depletion, a decline in living standards, and increased uncertainty in long-term economic planning.

The impact of exchange rates on macroeconomic variables has attracted considerable attention from researchers and has been extensively explored in both theoretical and empirical studies. Among these

variables, inflation stands out as a global issue that most countries struggle with. It is also one of the primary challenges facing monetary policymakers worldwide.

Given the importance of exchange rates and inflation as key economic indicators, it is essential to study their dynamics, monitor their developments, and examine the impact of exchange rate fluctuations on inflation in Algeria.

Study Problem

Based on the aforementioned considerations, this study seeks to address the following research question:

To what extent does the exchange rate of the Algerian dinar affect the inflation rate in Algeria during the period 1990–2023?

Study Significance:

The significance of this study stems from the crucial role of the exchange rate both domestically and internationally, as well as its sensitivity as a key economic variable. Additionally, the study is important in highlighting the impact of asymmetric exchange rate fluctuations on the inflation rate in Algeria during the period 1990–2023.

Study Objectives:

The study aims to:

- Provide a theoretical framework for both exchange rates and inflation.
- Examine the impact of exchange rates on inflation.
- Analyze the relationship between the Algerian dinar exchange rate and the inflation rate during the period 1990–2023.
- Assess the effect of asymmetric exchange rate fluctuations on inflation in Algeria from 1990 to 2023 using the VAR model.

Study Methodology:

This study adopts a descriptive-analytical approach, which aligns with the research objective of data collection and analysis. Additionally, it employs an inductive (quantitative) method, utilizing econometric techniques, specifically the VAR model, to examine the impact of asymmetric exchange rate fluctuations on inflation in Algeria during the period 1990–2023. The analysis is conducted using EViews 12 software.

1. Theoretical Framework of Exchange Rates and Inflation:

1.1 Definition of Exchange Rate:

- The exchange rate refers to the price of the domestic currency expressed in units of a foreign currency. Like other relative prices, it is determined by the interaction between supply and demand for both currencies (Piros & Pinto, 2013, p. 484).
- The exchange rate is defined as the number of units of one currency required to obtain one unit of another currency. It also reflects the relative strength of the national currency compared to a foreign currency (Latrash, 2005, p. 96).

There are two primary methods for quoting exchange rates:

- Direct Quotation: Refers to the number of units of foreign currency required to purchase one unit of the local currency (Okungbowa, 2015, p. 103). The United Kingdom is one of the most notable countries that use this pricing method.
- Indirect Quotation: Represents the number of units of the national currency required to obtain one unit of foreign currency. Most countries worldwide adopt this pricing method (Imad & Azhar, 2022, pp. 143-144).

1.2 Types of Exchange Rates:

- Nominal Exchange Rate: This is the rate that determines the value of one currency in relation to another. Currency exchange transactions—whether buying or selling—occur based on the rates set between the currencies. The nominal exchange rate is determined by market forces of supply and demand within the foreign exchange market over a specific period (Khalid, 2014, p. 182).
- Real Exchange Rate: This exchange rate accounts for price levels in both countries. If the general price level in a given country is (P), the foreign price level is *(P*)*, and the nominal exchange rate is (E), then the real exchange rate is defined as follows (Al-Bukhari, 2010, p. 120):

$$e = EP*/P$$

Where **e** represents foreign prices in terms of local prices.

- Real Effective Exchange Rate (REER): For the real effective exchange rate to accurately reflect a country's external competitiveness, it must be adjusted to eliminate the effects of relative price changes (Haiba & Siham, 2021, p. 347).
- Cross Exchange Rates: Cross exchange rates refer to the rates used in foreign currency trading within financial markets. These transactions emerged due to the risks associated with exchange rate fluctuations, leading to the development of both spot and forward markets. Trading operations occur based on two primary prices: the bid price and the ask price for each transaction. Currency pricing relies on the triangular arbitrage principle, which is based on the exchange of currencies to achieve the highest possible return, ultimately resulting in a surplus of some currencies relative to others (Alayachi & Abdelmajid, 2024, pp. 39-60).

1.3 Concept of Inflation:

Inflation is generally defined as:

- "A persistent and continuous increase in the general price level, leading to the erosion of the purchasing power of money and limiting its ability to perform its functions effectively (Dawood, 2010, p. 161)."
- "A sustained decline in the real value of a currency, measured by the overall quantity of goods and services that can be purchased with that currency at a given time (Ghazlan, 2002, p. 166)."

1.4 Types of Inflation:

There are several types of inflation, each influenced by various economic factors. Some of the most notable include:

- Open Inflation: This type is characterized by a continuous increase in prices without any barriers or restrictions preventing the rise. It occurs due to excess demand, where prices

naturally increase to maintain equilibrium between supply and demand without external or exceptional intervention from regulatory authorities (Al-Bunni, 2006, p. 280).

- Repressed Inflation: This form of inflation manifests as hidden or indirect price increases. It results from policies and measures implemented to suppress its explicit emergence, preventing noticeable price surges (Khalaf, 2008, p. 314).
- Hyperinflation: The most severe form of inflation, where prices surge to thousands of times their original levels. As a result, the purchasing power of currency collapses completely, leading to a total loss of confidence in money. Individuals attempt to dispose of their currency by any means possible. This type of inflation has been observed in various countries throughout history (Al-Qutait, 2018, p. 370).
- Imported Inflation: When the prices of imported goods rise for any reason, this increase is often transmitted to domestic goods, significantly affecting low-income earners. Consequently, demands for wage and salary increases intensify to mitigate the burden of rising costs (Toros, 2010, p. 194).
- Creeping Inflation: This refers to a slow but continuous increase in the general price level over a long period. Individuals often do not immediately perceive its impact or recognize its severity until a considerable amount of time has passed, despite its persistent nature (Nasif, 2008, p. 263).

1.5 The Impact of Exchange Rate Changes on Inflation:

A devaluation of the national currency leads to an increase in domestic prices, negatively affecting the balance of payments and diminishing the economy's competitive advantages. This depreciation raises the prices of imported goods, particularly raw materials and essential commodities, thereby increasing the cost of living and partially eroding real income. The higher cost of raw materials is often passed on to the final consumer, and the extent of inflationary pressure depends on the structure of the local economy, its capacity to provide domestic alternatives, the degree of economic openness, and the contractionary policies adopted by the government.

The rise in domestic goods prices, driven by increased raw material costs, leads to higher imports and a decline in exports, adversely impacting the balance of payments. This effect extends to economic growth rates, as individuals reduce their consumption and prioritize savings. To mitigate these challenges, authorities often resort to raising interest rates as a measure to curb inflation and restore economic equilibrium (Sahab, 2017-2018, p. 11).

2. Analysis of the Relationship Between the Algerian Dinar Exchange Rate and Inflation (1990–2023)

The table below illustrates the fluctuations in the exchange rate of the Algerian dinar against the U.S. dollar over the study period.

Table (01): Evolution of the U.S. Dollar Exchange Rate Against the Algerian Dinar (1990–2023)

Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Exchange Rate	8,960	18,470	21,840	23,350	42,892	52,175	56,185	58,431	60,353	69,314	75,342
Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011

Exchange Rate	77,819	79,723	72,612	72,613	73,379	71,158	66,829	71,182	72,730	73,943	76,056
Years	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Exchange Rate	78,102	78,152	87,903	107,131	110,527	114,932	118,290	119,159	132,131	138,837	137,577
Years	2023										
Exchange Rate	13,548										

Source: Prepared by the researchers based on Bank of Algeria annual reports

Table (01) indicates that the exchange rate of the Algerian dinar against the U.S. dollar experienced significant fluctuations throughout the study period from 1990 to 2022. In 1991, the exchange rate slightly declined compared to 1990, dropping from 18.960 dinars per U.S. dollar in 1990 to 18.470 dinars per dollar in 1991. This decrease was mainly attributed to Algeria's repeated devaluation of its national currency, particularly following the external debt rescheduling agreement and the extended financing arrangement with the International Monetary Fund (IMF) between 1990 and 1993. These measures contributed to a relative stabilization of the Algerian dinar during those years. However, the situation changed in 1994, when the exchange rate surged to 42.892 dinars per U.S. dollar.

In 1994, the authorities implemented a two-stage devaluation of the Algerian dinar, totaling a 70% depreciation, which took place between April and September of the same year. During this period, the exchange rate system was adjusted to a managed float regime, controlled by the central bank in coordination with commercial banks. Between 1995 and 2002, the exchange rate steadily increased, rising from 52.175 dinars per U.S. dollar in 1995 to 79.723 dinars per U.S. dollar in 2002.

In 2003, the Algerian dinar appreciated against the U.S. dollar, as the exchange rate fell from 79.723 dinars per U.S. dollar in 2002 to 72.612 dinars per U.S. dollar in 2003. This appreciation was largely due to the central bank's intervention, which aimed to reduce the excess money supply circulating in the parallel market by strengthening the dinar.

Until 2008, the exchange rate continued to decline, reaching 71.182 dinars per U.S. dollar. This was primarily due to the collapse of the U.S. dollar's value following the global financial crisis, which severely impacted the world economy that year.

From 2009 to 2014, the exchange rate followed a steady upward trend, reaching 97.903 dinars per U.S. dollar in 2014. However, between 2015 and 2016, the exchange rate surged significantly due to the decline in oil prices, which exacerbated the budget deficit and the balance of payments deficit. As a result, the exchange rate increased from 107.131 dinars per U.S. dollar in 2015 to 110.527 dinars per U.S. dollar in 2016.

In 2017, the upward trend persisted due to the declining purchasing power of the Algerian dinar, pushing the exchange rate to 138.873 dinars per U.S. dollar in 2021. However, a slight decline was observed in 2022 and 2023, bringing the exchange rate down to 135.48 dinars per U.S. dollar in 2023.

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2. Evolution of the Inflation Rate in Algeria (1990–2023)

Table (02): Evolution of the Inflation Rate in Algeria (1990–2023)

Years	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Inflation Rate	16,70	25,90	31,70	20,50	29,00	29,80	18,70	5,70	5,00	2,60	0,30
Years	2001	2002	2003	2004	2005	2006	2007	2008	2009	2020	2011
Inflation Rate	4,20	1,40	4,30	4,00	1,40	2,30	3,70	4,90	5,70	3,90	4,50
Years	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Inflation Rate	8,90	3,30	2,90	4,80	6,40	5,60	4,30	2,00	2,40	7,20	9,26
Years	2023										
Inflation Rate	9,23										

Source: Prepared by the researchers based on Bank of Algeria annual reports

Table (02) demonstrates that inflation rates in Algeria exhibited significant fluctuations throughout the study period. Between 1990 and 1995, inflation rates rose continuously, increasing from 16.70% in 1990 to 29.80% in 1995, marking the highest inflation rate recorded in Algeria to date. This sharp increase was primarily attributed to economic policies adopted by the government, such as price liberalization, excessive money issuance, and repeated exchange rate devaluations implemented by monetary authorities during that period.

From 1996 to 2000, inflation rates in Algeria declined sharply and consistently, dropping from 18.70% in 1996 to 0.30% in 2000, the lowest inflation rate recorded in the country. This decrease was largely due to monetary policy measures, including reducing the money supply, limiting currency issuance, raising interest rates, and strengthening foreign exchange reserves.

Starting in 2001, inflation rates rose again, reaching 4.20%, mainly due to an expansion in the money supply. This upward trend persisted until 2014, when inflation fell to 2.90%. However, in 2015, inflation surged again, reaching 4.80%.

At the beginning of 2017, inflation began to decline, falling from 5.60% in 2017 to 2.40% by 2020. This decline was primarily driven by a drop in prices of certain food products. However, from 2021 to 2023, inflation rose significantly, reaching 9.23% in 2023, due to increasing food prices and higher money issuance.

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Figure (01): The Relationship Between the Algerian Dinar Exchange Rate and Inflation (1990–2023)

Unit: %

Source: Prepared by the researchers based on data from Tables 01 and 02.

During the period 1990 to 2023, Algeria devalued its currency twice as part of the reforms mandated by the International Monetary Fund (IMF). However, this policy did not alleviate inflationary pressures; instead, inflation rates remained high, with an average of 25.75%. This was primarily due to monetary expansion, an increase in the money supply, and expansionary fiscal policies implemented during that period. Additionally, economic recovery programs and excess liquidity significantly contributed to rising inflation rates.

2.1 Findings from the Study Period

The study concludes that there is a direct relationship between fluctuations in the Algerian dinar exchange rate and inflation for several reasons (Wahiba & Kahina, 2022, pp. 373-374):

- The government directly intervenes in managing and controlling the Algerian dinar's exchange rate. This rate was adjusted through devaluation policies to achieve the objectives set by monetary authorities. These policies were closely tied to IMF-mandated reforms under the structural adjustment program, which aimed to reduce inflationary pressures. However, other factors also influence inflation rates, reflecting the complexity of Algeria's economic landscape. Thus, it can be inferred that the Algerian economy does not fully align with the Purchasing Power Parity (PPP) theory. According to this theory, exchange rates between two currencies should adjust to reflect changes in relative price levels.
- Although Algeria officially adopted a managed float exchange rate system in 1994, this contradicts the logic of PPP theory, which assumes free exchange between countries to equalize price levels. However, countries with fixed exchange rate regimes tend to have greater control over inflation compared to managed float systems, which lack absolute flexibility. Despite adopting this system since 1994, Algeria has failed to maintain exchange rate stability at low levels, as it has remained volatile throughout the study period.

3. Econometric Analysis of the Impact of Asymmetric Exchange Rate Fluctuations on Inflation in Algeria (1990–2023) Using the VAR Model:

3.1 Study Variables and Data Sources:

Table (03): Study Variables, Variable Type, and Data Sources

Variable	Unit of Measurement	Variable Type	Data Source
Exchange Rate (EXCH)	U.S. Dollar	Independent	Arab Monetary Fund
Inflation (INF)	Percentage	Dependent	World Bank Database

Source: Prepared by the researchers.

3.2 Stationarity of the Variable Series:

To formulate and estimate the econometric model, it is essential to analyze the stationarity of the time series used in the study. This step is crucial to avoid spurious estimates and misleading results. To achieve this, the Augmented Dickey-Fuller (ADF) test is applied under the null hypothesis, which states the presence of a unit root, implying that the series is non-stationary.

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Table (04): Stationarity Test of Time Series

	Level		First Difference	
INF	Constant	0,0706	Constant	0,0000
	Constant and Trend	0,7174	Constant and Trend	0,0001
	Without Constant and Trend	0,0075	Without Constant and Trend	0,0000
EXCH	Constant	0.7609	Constant	0,0066
	Constant and Trend	0,5893	Constant and Trend	0,0320
	Without Constant and Trend	0,9493	Without Constant and Trend	0,0026

Source: Prepared by the researchers based on EViews 12 outputs.

Based on the results presented in Table (04) for the unit root test applied to the exchange rate and inflation series, the p-values for both variables are found to be greater than the 0.05 significance level across different specifications. Additionally, since the calculated test statistics exceed the critical values, both series are non-stationary at the level. However, after taking the first differences, both series become stationary, indicating that the exchange rate (EXCH) and inflation (INF) variables are integrated of order one, I(1).

3.3 Cointegration Test:

Since both the exchange rate (EXCH) and inflation (INF) series are integrated of order one, I(1), there is a possibility of a cointegration relationship between them. One of the most widely used tests for detecting cointegration among variables is the Johansen cointegration test, the results of which are illustrated in the following figure.

Table (05): Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.315502	14.26835	20.26184	0.2714
At most 1	0.064633	2.138107	9.164546	0.7501

Source: EViews 12 Outputs.

Based on the results illustrated in Figure (02) for the Johansen cointegration test, the Trace statistics (14.2683, 2.1381) are lower than the critical values (20.2618, 9.1645). Therefore, we fail to reject the null hypothesis, indicating that no cointegration relationship exists between the variables. This conclusion is further supported by the p-values (0.2714, 0.7501), which are greater than the 5% significance level.

Considering the stationarity properties of the time series and the cointegration test results, we conclude that the most appropriate econometric model for this study is the Vector Autoregression (VAR) model.

3.4 Determining the Optimal Lag Length for the VAR Model:

Before estimating the Vector Autoregression (VAR) model, it is necessary to determine the appropriate number of lags for the model. To identify the optimal lag length, we rely on various selection criteria,

including Akaike Information Criterion (AIC) and Schwarz Information Criterion (SIC). The optimal lag length is selected based on the lowest value of these criteria.

Table (06): Results of Optimal Lag Length Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-250.7761	NA	41457.45	16.30813	16.40065	16.33829
1	-178.8841	129.8693*	519.8132	11.92801	12.20555*	12.01848*
2	-174.7781	6.887455	518.5830*	11.92117*	12.38375	12.07196
3	-173.2077	2.431653	612.7770	12.07792	12.72552	12.28902

Source: EViews 12 Outputs.

Based on the results presented in Table (05), the lowest values of the selection criteria indicate that the optimal lag length for estimating the relationship between exchange rate and inflation rates is one (1) VAR.

3.5 Estimation of the VAR Model:

Inflation Equation (INF)

$$INF = 4.855 + 0{,}755Inf_{(-1)} - 0{,}0392EXCH_{(-1)}$$

$$R_1^2 = 0{,}7411 \qquad F_1 = 42.9536 \qquad N = 33$$

Source: Prepared by the researchers based on EViews 12 outputs.

3.6 Model Significance:

The F-statistic for both equations was found to be greater than the tabulated values (4.17), indicating that the equation is statistically significant as a whole. This confirms that the model is statistically valid.

Explanatory Power:

Regarding the coefficient of determination (R^2), the results show that 74.11% of the variations in the inflation rate can be explained by its past values and exchange rate fluctuations, while the remaining percentage is attributed to other factors not included in the model.

Economic Analysis:

Examining the coefficient of the exchange rate with a one-period ($EXCH_{(-1)}$), the results indicate an inverse relationship between the exchange rate and inflation. This implies that a 1% change in the exchange rate in a given year leads to a 0.0392% change in inflation in the following year, but in the opposite direction. This finding is consistent with economic theory, which suggests that exchange rate movements influence inflation through various transmission mechanisms.

3.7 Diagnostic Tests for the Model:

To ensure that the econometric model is suitable for dynamic analysis, it is essential to validate its econometric properties. Among the diagnostic tests used for this purpose are:

- Model Stability Test: The inverse roots of the characteristic polynomial test is used to verify the stability of the estimated model. The results, illustrated in Figure (03), indicate that all roots (points) lie within the unit circle, confirming that the estimated model is stable.

Figure (02): Stability of the Estimated Model

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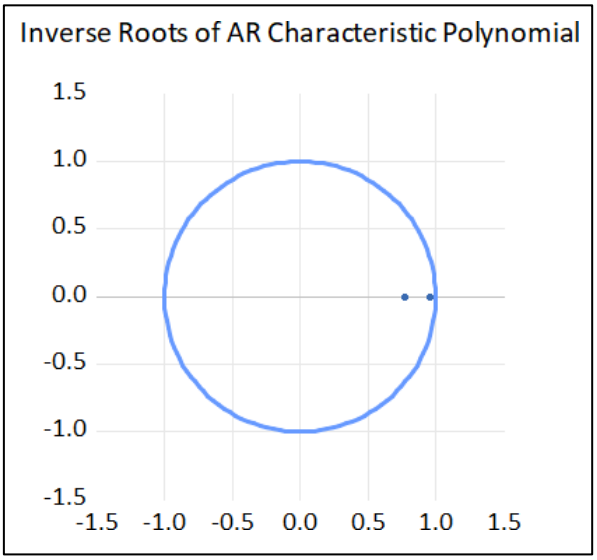

Source: EViews 12 Outputs.

Autocorrelation and Normality Test

To ensure the reliability of the model, autocorrelation and normality tests are conducted to verify that the residuals exhibit no serial correlation and follow a normal distribution.

Table (07): Autocorrelation and Normality Test

	LM Test		Jarque- Bera Test	
	F-stat	p-value	JB	Prob
Inflation Model	0,298	0,878	2.88	0,578

Source: Prepared by the researchers based on EViews 12 outputs.

The LM test is used to examine the presence of autocorrelation in the residuals of the estimated model. The p-value (0.298) for the model is greater than the 5% significance level, indicating that there is no issue of autocorrelation in the residuals.

The Jarque-Bera test is employed to assess the normality of the residuals. According to the previous table, the Jarque-Bera statistic (2.88) is less than the critical value of the Chi-square distribution (3.841) at the 5% significance level. This implies that the model residuals follow a normal distribution, further confirmed by the p-value (0.578), which is greater than 0.05.

Conclusion:

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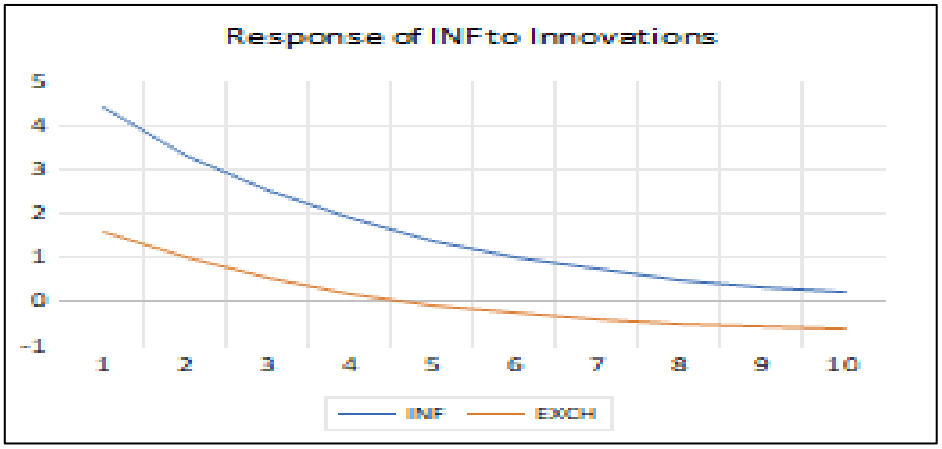
After conducting the necessary diagnostic tests, the results confirm that the estimated model meets econometric validity criteria and is therefore suitable for representing the dynamic behavior of the study variables.

3.8 Dynamic Analysis:

Impulse Response Function (Shock Analysis)

Figure (03): Impulse Response Function Analysis



Source: EViews 12 Outputs.

From the previous figure, which illustrates the Impulse Response Function (IRF) analysis, we observe that a 1% shock in exchange rates has a positive impact during the first four years, with significantly high effects. Specifically, in the first and second years, the impact reached 99.60%. However, starting from the third year, the effect of the exchange rate shock on inflation began to decline, reaching 53.8%, and continued decreasing in the fourth year to 19.36%.

From the fifth year onward, the response of inflation to the exchange rate shock turned negative, albeit at a low level, registering -0.06%. This negative effect continued to increase over the following years, with the impact on inflation reaching -60.9% in the tenth year following the shock.

3.9 Variance Decomposition Analysis:

Table (08): Variance Decomposition of the Inflation Variable

Variance Decomposition of INF:

Period	S.E.	EXCH	INF
1	5.481197	11.68569	88.31431
2	7.756857	10.45434	89.54566
3	9.486189	9.478581	90.52142
4	10.91590	8.804512	91.19549
5	12.14098	8.446309	91.55369
6	13.21091	8.387830	91.61217
7	14.15619	8.590271	91.40973
8	14.99779	9.002395	90.99760
9	15.75124	9.569994	90.43001
10	16.42860	10.24269	89.75731

Source: EViews 12 Outputs.

From the variance decomposition analysis, we observe that most of the short-term fluctuations in inflation are primarily driven by shocks within the variable itself, accounting for 88.31% in the first year. This proportion continued to increase over time, reaching a peak of 91.61%, meaning that approximately 91% of the variations in inflation originate from its own past fluctuations by the sixth year, while 8.38% of the variations are attributed to exchange rate shocks. However, in the last three years of the study period, the impact of exchange rate shocks increased slightly, reaching 10.24% in the final year.

Conclusion:

The exchange rate is one of the most significant economic variables at both the domestic and international levels, serving as a link between local prices and international price levels while also reflecting the strength and stability of a country's economy. Given its interactions with multiple macroeconomic indicators, this study aimed to analyze the impact of asymmetric exchange rate fluctuations on inflation in Algeria over the period 1990–2022. The key findings of the study are as follows:

- The exchange rate of the Algerian dinar against the U.S. dollar represents the number of domestic currency units required to obtain one U.S. dollar.
- The exchange rate is both an influencing and influenced factor, as it is affected by real GDP, the degree of economic openness, and net financial transactions with foreign markets. Meanwhile, it has a direct impact on international trade between countries. Additionally, the exchange rate may have a reciprocal relationship with other macroeconomic variables, such as inflation.
- The Algerian economic reality does not align with the Purchasing Power Parity (PPP) theory, which states that exchange rates between two currencies should adjust to reflect changes in price levels. This discrepancy is due to the absence of a free-floating exchange rate system and the existence of restrictions on the volume and type of trade transactions with foreign markets.
- Based on stationarity and cointegration tests, the most appropriate econometric model for analyzing the relationship between the exchange rate and inflation is the VAR (1) autoregressive model.
- The model estimation results indicate an inverse relationship between inflation and the exchange rate, with approximately 74% of inflation variations attributed to its past values and exchange rate fluctuations in Algeria during the study period.
- Shock analysis and impulse response functions reveal that exchange rate fluctuations in Algeria have a stronger positive effect on inflation in the short term, whereas in the long term, the impact turns negative.
- Variance decomposition analysis demonstrates that most short-term inflation fluctuations are driven by shocks within the inflation variable itself, while the exchange rate's contribution to these fluctuations does not exceed 11% throughout the 10-year variance decomposition analysis period.

Study Recommendations:

Based on the study’s findings, the following recommendations are proposed:

- Encouraging the development of small and medium-sized enterprises (SMEs) to increase national production, which would help reduce imports and boost exports. This, in turn, would

mitigate inflationary pressures imported from global markets, particularly those stemming from rising import prices.

- Enhancing and activating the Algerian financial market to attract portfolio investments, which would increase demand for the national currency and contribute to raising the exchange rate of the Algerian dinar. Since demand for local financial instruments translates into demand for the national currency, this would strengthen Algeria's share of international capital flows, which are essential for supporting economic development.

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