Journal of Economic Growth and Entrepreneurship JEGE
Spatial and entrepreneurial development studies laboratory
Year : 2023 Vol.6 No.3 pp: 1-12

The impact of the exchange rate on inflation in Algeria

RedouaneAit Kaci Azzou[1]

[1]*University Center Morsli Abdullah, Tipaza, Algeria, aitkaciazzou.redouane@cu-tipaza.dz*

ARTICLE INFO

Article history:
Received:19/08/2023
Accepted:14/11/2023
Online:31/12/2023

exchange rate
inflation
ARDL
Algeria
JEL Code: E31-E42

ABSTRACT

The strength of an economy is measured by several indicators, with one of the most crucial being the stability and steadiness of the exchange rate. A robust economy fosters a strong and desirable currency, whereas inflation poses an economic challenge faced by many countries due to its negative repercussions on economic activities.
The aim of this study was to determine the impact of the exchange rate on inflation in Algeria during the period 2019-2022. This was achieved by employing a descriptive-analytical approach to explain the study's variables. Additionally, an empirical approach was used, relying on the Autoregressive Distributed Lag (ARDL) time series method. The study concluded the existence of a causal relationship between the exchange rate and inflation in both the short and long terms.

1.Introduction:

The exchange rate is among the most important means used by the monetary authority in achieving the economic policies of the state, as it is one of the macroeconomic indicators that is characterized by a very high sensitivity to fluctuations that may lead to internal and external instability, which may expose the national economy to crises such as the inflation crisis.
Hence, it becomes imperative to establish the existing relationship between the exchange rate and inflation in Algeria
The research problem: In light of the above, the following research problem araise: What is the effect of the exchange rate on inflation in Algeria?.

-Studyhypotheses:

In order to be able to answer the problemposed, the followinghypotheseswereformulated:
- The existence of a long-termequilibriumrelationshipbetween the exchange rate and inflation;
- The direction of the relationshipbetween the exchange rate and inflation in Algeria differs in the short and long.

-Purposes of the search:

Throughthisstudy, weseek to achieve a number of objectives:

- To comprehend the fundamental concepts of the exchange rate ;
- To comprehend the fundamental concepts of inflation;
- To deduce interpretive results on the impact of the exchange rate on inflation, for practical utilization by economic policymakers in finding solutions to inflation in Algeria.

-Previousstudies:

- **A study by Saleh Oyaya**(saleh, 2019)**,** entitled The Effects of Exchange Rate Policy on the Level of Inflation, A Case Study of the Arab Maghreb Countries During the Period 1970-2018, a dissertation submitted for a doctoral thesissubmitted to the Faculty of Economic, Commercial, and Management Sciences, specializing in International Trade, Ammar Thliji, El OuedUniversity.

*Corresponding Author : *RedouaneAit Kaci Azzou*

The studydealtwith the long-term and short-termrelationshipbetween inflation and the exchange rate in each of Algeria, Tunisia and Morocco, usingannual time series dataand the Auto-Regressive Distributed Lag (ARDL) method in order to determinethe impact of the US Dollar and Euro exchange rates against local currencies on financial .

- **Saliha Ouddane, and Hamza Ammi Said** (An econometric study of the effect of each of the exchange rate and the interest rate on inflation in Algeria using ARDL using data for the period from 1998 to 2021, 2023), an article titled An EconometricStudy of the Effect of Each of the Exchange Rate and Interest Rate on Inflation in Algeria Using the ARDL Model Using Data from 1998-2021.
The resultsconcludedthat the authoritiesresorted to raising the interest rate on savings in order to absorb the surplus money supply, whichlimits inflation, and therefore the relationshipis inverse betweenthem, and the rise in domesticpricescompared to international prices leads to an increase in imports and an increase in demand for foreigncurrency, and a decrease in exports and the supply of foreigncurrency, which leads to A rise in the foreign exchange rate because the riseorfall in the generallevel of prices affects the exchange rate and its fluctuations.

-**Brahm Ismail, Boualaq Noura and Bouamra Hassan**(Ismail, Boualeg, & Bouamra, 2023), an article titled The Relationship of the Exchange Rate with the Inflation Rate in Algeria Using the ARDL Model During the Period 1990-2021.
The resultsconcludedthatthereis an inverse relationshipwith a negativeeffect of changes in the exchange rate fluctuations on the inflation rate. Additionally, therewascoherence and stabilityinthe relationshipbetween the exchange rate and the inflation rate in the long and short term.

2.exchange rate:

Money is a universallyaccepted medium whenitfunctions as a national currencywithin a country.However,in light of the economicopennessthat the countries of the world are experiencing, the intertwining of international economic relations, the high rates of trade exchange and the multiplicity of currencies in circulation, itnecessitated the existence of a clearmechanismthroughwhicheachcurrency in circulation isevaluatedagainst the rest of the currenciesOther, thismechanismiscalled the exchange rate

2.1 Definition of Exchange Rate:

There are severaldefinitions of the exchange rate, including the following:
-The exchange rate can beviewedfromtwo angles. From the first angle, itisdefined as the number of units of local currencythat are exchanged for one unit of foreign exchange.From the second angle, itis the number of units in foreigncurrencythat pays a price to obtain one unit of local currency(Samir, 2011).
-The exchange rate is "the price of one currency for another, or itis the ratio of the exchange of twocurrencies. One of the twocurrenciesisconsidered a commodity and the othercurrencyisconsidered a price for it. In thisway, itembodies the linkbetween the local economy and the rest of the economies, and links the prices of commodities in the local economywiththeirprices in the global market. The global price and the local price of the commodity are linkedthrough the exchange rate"(Keddi, 2005).
- It is the ratio according to which national monetaryunits are exchanged for foreignmonetaryunits at a known time, and by foreigncurrencywemean all deposits, credits and payments due in a currency, in addition to transfers, travelers checks and drafts(Arfane, 1999).
From the foregoing, we can definethat the exchange rate is "the ratio on the basis of whichforeign exchange isexchanged for national currency."

2.2 Types of exchange rate:

There are several types of exchange rate, which are dividedinto the following:

- **Nominal exchange rate:**

The nominal exchange rate for a currencyisdeterminedaccording to the demand and supply for it in the exchange market at a certain point in time, and the nominal exchange rate isdividedinto an official exchange rate and a parallel exchange rate, implyingthat multiple nominal exchange rates can exist for the samecurrencycurrency at the same time and place.

- **The real exchange rate:**

It isdefined as the number of units of foreigngoodsneeded to purchase one unit of domesticgoods. It measures the level of competition and considers the degree of inflation. Thus, the real exchange rate accounts for inflation whencalculating the nominal exchange rate.

- **Actual exchange rate:**

It is a nominal effective exchange rate weighted by the relative pricesbetween the concerned country and itsmost important trading partners.

- **The equilibrium exchange rate:**

Definedaccording to EDAWARDS 1989 as the ratio of tradedgoods to non-tradedgoods(Maachi, 2016)
It isalsoknown as the price at which the supply of foreign exchange and the demand for it are equal, thatis, the absence of a state of surplus or deficit in foreign exchange, and equilibriumoccurs at the point where the foreign exchange supplycurveintersectswith the demandcurve for it(Kaddam, Amar, Aboud, & Salim).

3.Inflation:

Inflation is one of the most important economicproblems, boththeoretical and practical. This problem has become a concern for economicpolicymakers in all countries. It has alsobecome a focus of attention for monetarypolicymakers in particular, after the responsibility for treatingthisphenomenon has been transferred to the monetaryauthorities in many countries.

3.1 Definition of Inflation:

Variousdefinitions of inflation have emergedwithineconomicthought, stemmingfromnumerouswritingsthat have tackledthisphenomenonSome of thesewritings have focused on the aspect of inflation, consideringit a rise in the generallevel of prices. For instance, inflation isdefined as "a continuous and tangible increase in the generallevel of priceswithin a country" (Alwazni & Alrafai, 2003)It wasalsodefined as “a persistent and ongoingdecrease in the real value of the monetary unit(Albakri & Saffi, 2002),Throughthesedefinitions, itisclearthat inflation expresses an increase in the amount of money in circulation to such a degreethatit leads to a decrease in its value, whichisreflected in the form of a rise in local pricelevels, with stable incomelevels, sothat inflation leads to a decrease in the purchasing power of the currency unit.
Whilesome of thosewritingsrelied in defining the phenomenon of inflation on the causes that lead to inflation, withvarying focus on these causes from one definition to another(Anaya, 1985).
Despite the multiplicity of definitionsaddressingthe phenomenon of inflation, theyallindicatethatitrepresents successive rises in the generallevel of prices and a decrease in the purchasing power of the monetary unit. Thus, the definition of inflation includes the followingcharacteristics:
Inflation ismeasured by the so-calledgenerallevel of prices, whichisdefined as "a weightedaverage of the prices of a group of goods and services used or consumed in a country."
Inflation expresses a tangible rise in the generallevel of prices, where the rise in the generallevel of prices must beclear and tangible in society, and that the riseincludes a period of time thatis not short, as inflation isexpressed as a dynamic process that can beobserved over a relatively long period.

3.2 Types of inflation:

Severalcriteria are used to define the different types of inflation. Someeconomists base their classifications on the underlying causes, whileothers focus on characteristics or resultingeffects. In the following, wediscuss the threecriteriaused:

- ✓ The criterion for the degree of state control over the creditapparatus;
- ✓ Inflation source standard;
- ✓ Inflation rate**.**

3.2.1 Criteria for the degree of state control over the creditsystem:

The degree of control of the state in the credit system means the extent of the effectiveness of the devicethat the state puts in order to monitor the movements of pricelevels and influence them. The strongerthisdeviceis, the higher the degree of control and vice versa. By determining the degree of control, we can identify the type of inflation present in the economy.

3.2.1.1 Apparent inflation:

This type of inflation ischaracterized by a continuousrise in pricelevelswithout the state takinganymeasures to counteritor limitit. According to this type of inflation, pricesrise in response to excessdemand, in the sensethatpricesriseautomatically and freely in order to achieve a balancebetweensupply and demand.
In addition to the lack of intervention by the state, there are otherfactorsthat stand behind the successive rises in the generallevel of prices, and help to exacerbateinflationary pressures, including the prevailingeconomic conditions, in particular the weakflexibility of the local production apparatus, in addition to the psychologicalfactors of individuals.

3.2.1.2 Suppressed inflation :

The experiences of many countries have demonstrated the possibility of the emergence of cases in whichprices are subject to inflationary pressure and yetmaintaintheirstability, as a result of adoptingpoliciesthatrequirefreezingprices and limitingtheirincrease. Therefore, manyeconomistsprefer to definethese cases as pent-up inflationaryphenomenadespite the stability of prices(Attouane, 1989).
Among the policies and measurestaken by the government to limit the spread of this type of inflation, is the establishment of restrictions and controlsthatlimit total spending, exchange control, achieving a budget surplus, and applying the cardselling system ... etc., but soon the state isforced to withdrawthesemeasuresunder The pressure of the forces of inflation causes prices to rise, as happened in many countries, especially those that support prices, and somepricesmaybesubject to control whileothers are left free or control over themis not tight, sopricesrise at differentlevels in the markets, soit can besaid that price control is the sameWhetheritis public or private, itdoes not excludeexcessdemand, but itstagnatesitseffects for a period of time, until a large amount of liquid cash can accumulate, whichislaterconvertedintoadditional effective purchasing power.

3.2.1.3 latent or hiddeninflation:

It affects the monetary national income in the form of a large abnormalincrease in theseincomeswithoutallowingit to find a naturaloutlet in the form of an increase in spending on consumption and investmentcommodities.
Or itisincome inflation thatis not accompanied by spending inflation(Madjedi abdelfatah, 2002),The appearance of thistype of inflationis due to the state's intervention in imposingvarious restrictions on spending, such as the commodity distribution system.

3.2.1.4 Importedinflation:

The term "imported inflation" refers to inflation thatistransmittedfrom one economy to anotherthrough international trade channels and the movement of capital. Through the process of importingsomegoods and services that have known a rise in prices, theyinevitably lead to a rise in theirprices in the internalmarkets, and the severity of this type of inflation varies from one country to another, according to the degree of itsopennessto externaltrade.

3.2.2 The intensity of inflationarypressure:

Economistsdistinguishbetweendifferent types of inflation based on the extent of inflationary pressure.

3.2.2.1 Hyperinflation:

Hyperinflation represents the extremeform of inflation, achieved throughrapid and sharprises in prices.The value of money diminishessignificantly, leading to a substantialloss of purchasing power over short periods of time.Consequently, money isdiscardedduring hyperinflation, as itsrapid and steepdecline in purchasing power prompts people to spendit as quickly as possible, whileretainingother non.monetary assets(Fellih, 2006).

3.2.2.2 Creeping (gradual) inflation:

This is a part of priceincreasesresultingfrom the rise in wages at a ratehigherthan the increase in production. It isgradual, slow and moderate inflation compared to the natural forces of economicgrowth. However, itscontinuity and the accumulation of itseffects can lead to the occurrence of unbridled inflation.
This type of inflation ischaracterized by a slow rise in prices and occurswhendemandincreases and production (supply) is stable (stable), and accordingly the generallevel of pricesrisesnaturally to 10%(Abdalmoutalib, 2013).

3.2.2.3 violent inflation:

It isgeneratedfromcreeping inflation, and itis more violent and stronger, as the movement of rise in wages and pricesentersinto a viciouscircle of many and successive increases. The economywill face the phenomenon of violent inflation, and then money will lose its basic functions, especiallywith regard to being a store of value and a unit of account, and itwillbecomejust a mediator in exchanges. And this type isfound in periods of wars and economic crises.

3.2.3 Source of Inflation Criterion:

In this case, we can distinguishbetweenthreeforms.

3.2.3.1 Exceptionalnaturalinflation:

This type of inflation is in the case of natural conditions such as the spread of diseases and epidemics or because of earthquakes and floods.For instance, in 2004, in Southeast Asian countries, pricessurged to record levels due to naturaldisasters. Thesenaturalphenomena serve as catalysts for inflationary

3.2.3.2 Demand.Pull Inflation:

This type of inflation occurswhen the total demand for goods and services in society isgreaterthan the total supply of thesegoods and services. This analysisis due to bothVexel and Keynes. Especiallywhen the economyis operating at a level close to the level of full employment, these cases lead to an increase in the generallevel of prices for goods and services, which in turn leads to an increase in the prices of services and factors of production, so the cost of production increases, and accordingly the prices of goods and services rise(Bessam & Abdellah, 2010).

3.2.3.3 Cost.Push Inflation :

It is an increase in the costs of producinggoods and services due to pressure fromworkers to raisetheirwages, and to indicatethatbecause of the high cost of living, workers are demandinghigherwages to meetthisrise. To counterthisrise, thisgenerates a succession of risingprices to dangerousinflationary situations. Wage inflation isreflected in labor unions obtaining an increase in nominal wages at rates thatexceed inflation rates, which leads to an increase in real wages at rates thatexceed the increase in productivity.Usually, the monopolistsrespond to the markets for goods and services with an increase in wages, with an increase in pricesthatexceeds the cost of the increase in wages, which leads to a succession of a series of increases in wages and prices.

4.Measuring the impact of exchange rate fluctuations on inflation in Algeria:

In the appliedside of thisstudy, wewilltry to build a standard model that expresses for us the long and short termrelationshipbetween the exchange rate and inflation in Algeria during the periodJanuary 2019.December 2022 using the ARDL method.

3.1 Pre.tests

Both the general formulation of a model and then the distribution of lag times over the model variables as per the AIC standard willbeexposed

3.1.1 Build the form :
The explanatoryeconomicfactorsunderstudytake a period of time to affect the dependent variable distributedbetween the short and long term, and therefore the ARDL test can beapplied, and the study model iswritten as follows:

$$\Delta INF_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta INF_{t-i} + \sum_{t=0}^{q} \beta_2 \Delta EUR_{t-i} + \alpha_1 INF_{t-1} + \alpha_2 EUR_{t-1} + \varepsilon_t$$

Where:

INF: inflation rate;
EUR: the exchange rate of the dinar against the euro;
p,q: the upperlimit of the time delays for the dependent and independent variable of the model;
0.2: long.termrelationship coefficients;β
$\alpha_{(1.2)}$: coefficients of the short.termrelationship (error correction model).

4.1.2 tability study of the variables

The stability characteristic is of great importance, as its lack of availability in the various variables used leads to false conclusions, so we will use the PP test to study the stability of the selected model chains, which we will take in its logarithmic form.

Table 01: Time Series Stability Test (Phillips.Perron Test)

UNIT ROOT TEST RESULTS TABLE (PP)
Null Hypothesis: the variable has a unit root

At Level			
		INF	EUR
With Constant	t-Statistic	-1.2607	-1.2870
	Prob.	***0.6400***	***0.6280***
		n0	n0
With Constant & Trend	t-Statistic	-1.1533	-0.8173
	Prob.	***0.9084***	***0.9566***
		n0	n0
Without Constant & Trend	t-Statistic	1.6519	0.4975
	Prob.	***0.9744***	***0.8192***
		n0	n0
At First Difference			
		d(INF)	d(EUR)
With Constant	t-Statistic	-4.7446	-3.9180
	Prob.	***0.0003***	***0.0040***
		***	***
With Constant & Trend	t-Statistic	-4.8778	-3.9412
	Prob.	***0.0014***	***0.0180***
		***	**
Without Constant & Trend	t-Statistic	-4.5423	-3.9197
	Prob.	***0.0000***	***0.0002***
		***	***

Notes:
a: (*)Significant at the 10%; (**)Significant at the 5%; (***) Significant at the 1% and (no) Not Significant
b: Lag Length based on SIC
c: Probability based on MacKinnon (1996) one-sided p-values.

This Result is The Out-Put of Program Has Developed By:
Dr. Imadeddin AlMosabbeh
College of Business and Economics
Qassim University-KSA

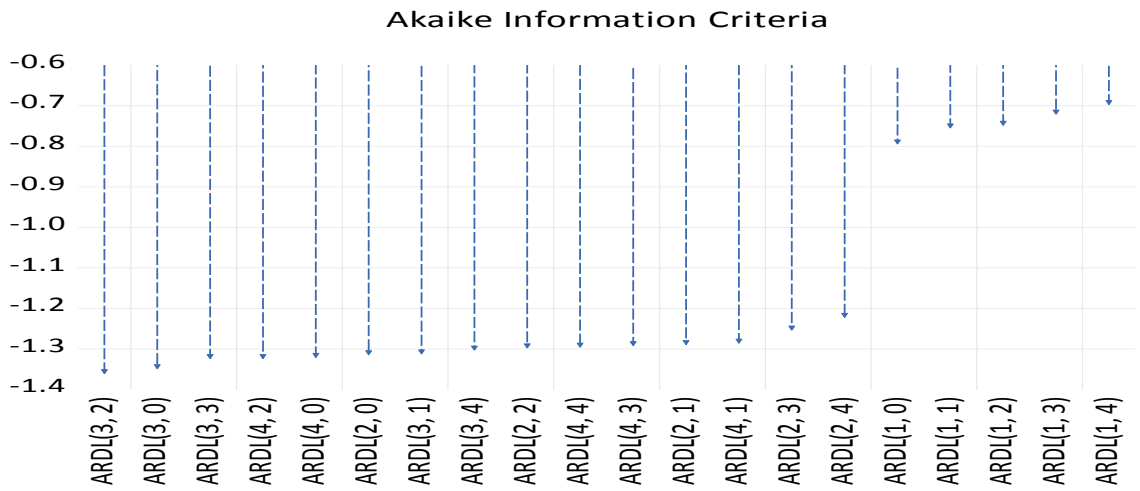
Source: Author computation using Eviews 12

Therefore, all variables are stable at the first difference, and thereforethey are integrated of degree I (1).

4.1.3 Choosing the optimal slowing down periods for the model

Through Figure No. 01, which shows the total possible modelswhenchanging the degrees of slowing down the model variables, afterdetermining the degree (1) according to the (Schwarz Information Criterion) statistic, and fromititisclearthat the model ARDL is the optimal model and has the lowest value according to the (Schwarz Information Criterion) statisticAkaikeInformatioCriterion), as shown in the followingfigure.

Figure 01: Results of the optimal deceleration test



Source: Author computation using Eviews 12

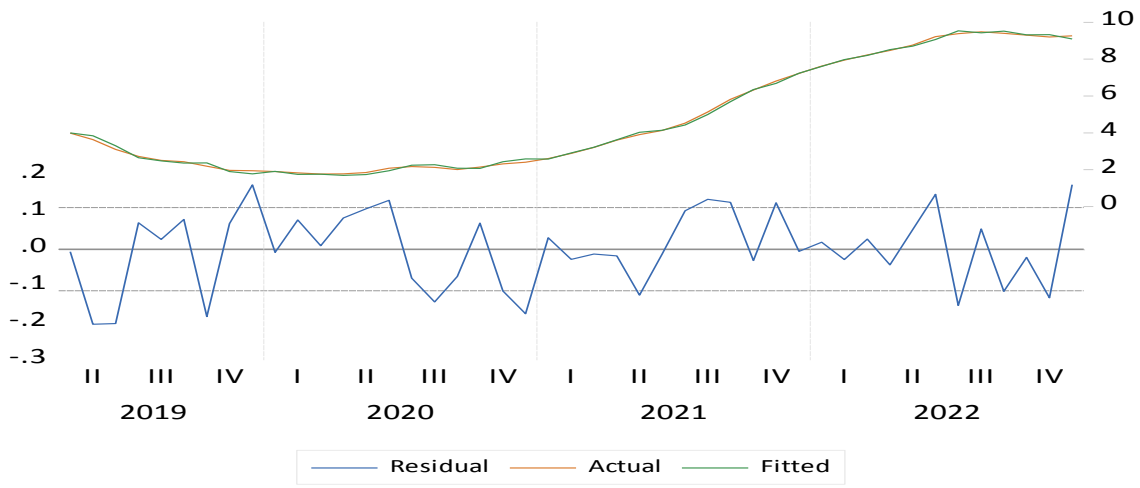
4.2. Testing the quality of the model (diagnosing the remains of the model)

Before adopting the ARDL model in estimating the short and long.term effects, the quality of the performance of this model should be confirmed by using the following tests:

4.2.1 Model quality

In order to study the quality of the model, it is necessary to compare the real values with the estimated ones through the following figure:

Figure 02: Real, Estimated, and Residual Values (Model Quality)



Source: Author computation using Eviews 12

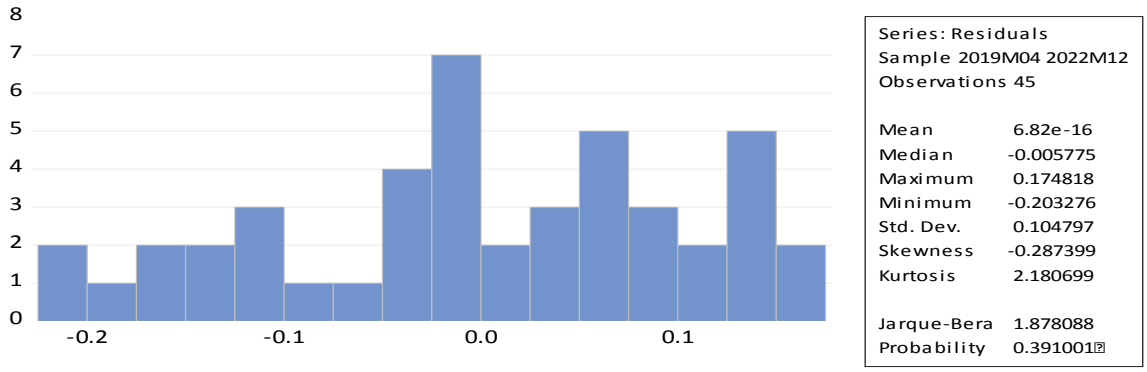
In Figure 02, we can see that the estimated values are close to the real values, which indicates the quality of the estimated model, so it can be relied upon in interpreting and analyzing the results.

4.2.2 the normal distribution of the residuals

The nature of the residual distribution is revealed by testing the hypothesis that "the residuals are distributed normally". This is done by extrapolating the statement that allows the observation of the residuals gathering around the center and decreasing as they move away from the center towards the periphery, or not gathering around the center, or through a statistical comparison (jarque.bera) with the tabular value (Chi.Square) at 02 degrees of freedom and a significant level 0.05 $x^2_{0,05}$.

According to Figure 03, we note that the test result was not significant ($\alpha > 0.05$), which supports that the residuals are subject to a normal distribution, and through the value of J.B = 1.87 less than $\chi 2 = 5.99$, which confirms that the residuals of the model are subject to a normal distribution, as shown in the following figure:

Figure 03: The normal distribution of the residuals



Source: Author computation using Eviews 12

4.2.3 Autocorrelation Test for Errors

The absence of autocorrelation between the residuals is revealed by testing the hypothesis that "there is no autocorrelation between the residuals", by comparing the Lagrangian (R.Square) statistic calculated via the (LM) test with the tabular value of the Chi.Square distribution at 02 degrees of freedom. And a significant level of 0.05 $x^2_{0,05}$.

Table 02: Results of the autocorrelation test for errors

Breusch-Godfrey Serial Correlation LM Test: Null hypothesis: No serial correlation at up to 2 lags			
F-statistic	0.499946	Prob. F(2,36)	0.6107
Obs*R-squared	1.216089	Prob. Chi-Square(2)	0.5444

Test Equation:
Dependent Variable: RESID
Method: ARDL
Date: 04/04/23 Time: 22:50
Sample: 2019M04 2022M12
Included observations: 45
Presample missing value lagged residuals set to zero.

Source: Author computation using Eviews 12

From Table 02 and according to the LM test the Prob chi.square is greater than 0.05 and thus we accept the null hypothesis that there is no autocorrelation.

4.2.4 Test for homogeneity of variance (stability over time)

And it is by comparing the (R.Square) statistic calculated through the (Breuch.Pagan.Godfrey) test with the tabular value of the Chi.Square distribution at 02 degrees of freedom and a significant level of 0.05 $x^2_{0,05}$.

Table 03: Results of the homogeneity of variance test

Heteroskedasticity Test: Breusch-Pagan-Godfrey Null hypothesis: Homoskedasticity			
F-statistic	0.944164	Prob. F(6,38)	0.4754
Obs*R-squared	5.838188	Prob. Chi-Square(6)	0.4416
Scaled explained SS	2.457703	Prob. Chi-Square(6)	0.8732
Test Equation: Dependent Variable: RESID^2 Method: Least Squares Date: 04/04/23 Time: 22:50 Sample: 2019M04 2022M12 Included observations: 45			

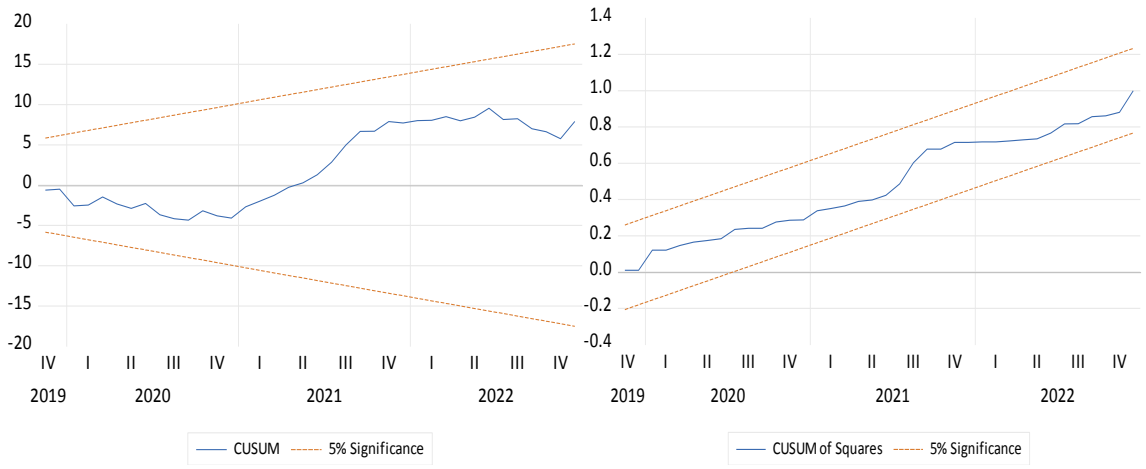
Source: Author computation using Eviews 12

From the table and according to this test, Prob F is greater than 0.05, which means that F is not significant, and therefore we accept the alternative hypothesis which states that the variance is constant

4.2.5 Stability test

In order to make sure that the data used is free of any structural changes and that the model is valid for prediction, the stability of the model must be judged through the graphic test of the movement of the model's residuals, as well as the squares of the model's residuals, as shown in the following figure.

Figure 04: Results of the stability test of the model



Source: Author computation using Eviews 12

Since the graphs in each of the CUSUM Test and the CUSUM of Squares Test are within the critical limits at the level of 0.05, we accept the stability of the model.

4.3 Testing the parameters of the model in the short and long terms

Here we study the possibility of a co.integration between the variables of the model, and an assessment of the impact of the exchange rate on inflation in Algeria, in both the long and short terms.

4.3.1 Cointegration Test Using the Bounds Test

The following table shows the results of the cointegration test using the Bounds Test methodology:

Table 04: Bounds Test Results

F-Bounds Test		Null Hypothesis: No levels relationship		
Test Statistic	Value	Signif.	I(0)	I(1)
		Asymptotic: n=1000		
F-statistic	4.159370	10%	3.02	3.51
k	1	5%	3.62	4.16
		2.5%	4.18	4.79
		1%	4.94	5.58
Actual Sample Size	45	Finite Sample: n=45		
		10%	3.19	3.73
		5%	3.877	4.46
		1%	5.607	6.193

Source: Author computation using Eviews 12

The results indicate that the calculated value of F.statistic is greater than the critical values of the lower and upper limits at most levels of significance. Therefore, we reject the null hypothesis, which states that there is no cointegration relationship between the variables, and this means that there is a long.term equilibrium relationship between inflation and the exchange rate.

4.3.2 Analysis and interpretation of the short.term relationship

Table 05 shows the results of estimating the short.term relationship between the exchange rate and inflation in Algeria during the period 2019-2022:

Table 05: The results of estimating the short term parameters and the error correction parameter

ARDL Error Correction Regression
Dependent Variable: D(INF)
Selected Model: ARDL(3, 2)
Case 2: Restricted Constant and No Trend
Date: 04/04/23 Time: 22:51
Sample: 2019M01 2022M12
Included observations: 45

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF(-1))	0.871063	0.146145	5.960261	0.0000
D(INF(-2))	-0.326132	0.145567	-2.240426	0.0310
D(EUR)	0.018805	0.007599	2.474718	0.0179
D(EUR(-1))	-0.016680	0.008086	-2.062846	0.0460
CointEq(-1)*	-0.001170	0.000323	-3.624204	0.0008

R-squared	0.849899	Mean dependent var	0.115333
Adjusted R-squared	0.834889	S.D. dependent var	0.270493
S.E. of regression	0.109912	Akaike info criterion	-1.473838
Sum squared resid	0.483224	Schwarz criterion	-1.273098
Log likelihood	38.16136	Hannan-Quinn criter.	-1.399004
Durbin-Watson stat	1.831903		

Source: Author computation using Eviews 12

Table No. 05 shows the following:

. The statistically positive and significant effect of the exchange rate on inflation in the short term, as the higher the euro exchange rate against the dinar increased by 1%, the inflation rose by 0.02%, which is consistent with the economic theory, as the depreciation of the national currency against the euro leads to a rise in import tax, including a rise Prices and the decrease in the purchasing power of the Algerian dinar, which leads to high inflation rates in Algeria, which is greatly affected by imported inflation.

. There is a short.term dynamic relationship between the exchange rate and inflation, and this is due to the estimated negative.signal error, which is statistically significant and its value was (CointEq(.1) = .0.0011), and it measures the imbalance rate in the dependent variable that can be corrected from one time period to another, and the negative sign It supports the existence of a long.term equilibrium relationship between the variables.

4.3.3 Analysis and interpretation of the long.term relationship

The following table shows the results of estimating the long.term relationship between spending on research and development and industrial growth in Algeria during the period 2019.2022:

Table 06: Long.term parameter estimation results

ARDL Long Run Form and Bounds Test
Dependent Variable: D(INF)
Selected Model: ARDL(3, 2)
Case 2: Restricted Constant and No Trend
Date: 04/04/23 Time: 22:50
Sample: 2019M01 2022M12
Included observations: 45

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.365270	0.404424	-3.375838	0.0017
INF(-1)*	-0.001170	0.007782	-0.150381	0.8813
EUR(-1)	0.009628	0.002790	3.450203	0.0014
D(INF(-1))	0.871063	0.150007	5.806829	0.0000
D(INF(-2))	-0.326132	0.156030	-2.090186	0.0433
D(EUR)	0.018805	0.008044	2.337781	0.0248
D(EUR(-1))	-0.016680	0.008594	-1.940882	0.0597

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
EUR	8.227005	54.88994	0.149882	0.8817
C	-1166.659	7812.504	-0.149332	0.8821

EC = INF - (8.2270*EUR - 1166.6590)

Source: Author computation using Eviews 12

Table No. 06 shows the following:

. The positive effect of the exchange rate on inflation in the long term, but it is statistically insignificant, that is, there is no effect of the exchange rate in current value on inflation, and this is because the effect of exchange rate fluctuations appears quickly, so we found the effect in the short term, just as the exchange rates of the euro in the past year It affects inflation in the long term, and this is due to citizens' fear of rising prices and the disruption of their consumption behavior, which negatively affects the purchasing value of the Algerian dinar.

5.Conclusion:

After conducting a study of the impact of the exchange rate on inflation in Algeria during the period between 2019.2022, and assessing and discussing its results, the study reached a number of findingsthat can be mentioned in the following points:

The results of the structural stability test of the model's coefficients indicated that there is a stable and harmonious relationship between the exchange rate and inflation in Algeria.

. The results of the measurement problems detection test showed that the model does not suffer from measurement problems, and therefore the model is valid for study

. The existence of a long.term equilibrium relationship between inflation and the exchange rate.

Recommendations:

The monetary authority in Algeria must choose an appropriate monetary policy to target inflation in the long term through the exchange rate channel, in order to maintain low and stable inflation rates at acceptable levels to reduce the negative effects of inflation.

6.References:

Abdalmoutalib, A. (2013). Monetary policy and independence of the central bank. Oman: University house.

Albakri, A., & Saffi, W. (2002). Money and banking between theory and practice. Oman: Dar Al.Mustaqbal for Publishing and Distribution.

Alwazni, k., & Alrafai, A. (2003). Principles of macroeconomics between theory and practice. Oman: Wael Publishing House.

An econometric study of the effect of each of the exchange rate and the interest rate on inflation in Algeria using ARDL using data for the period from 1998 to 2021. (2023, Juin). Journal of Economics and Business Administration , pp. 63.80.

Anaya, G. H. (1985). financial inflation. Egypt: University Youth Foundation.

Arfane, T. A. (1999). international finance. Oman: Majdalawi Publishing House.

Attouane, M. (1989). Economic Measures: Monetary Theories. Constantine: Research House for printing and publishing.

Bessam, A., & Abdellah, R. (2010). Macroeconomics. Beirut: The Lebanese House of Manhal.

Fellih, H. K. (2006). Money and banks. Oman: The world of modern books for publication and distribution.

Ismail, B., Boualeg, n., & Bouamra, H. (2023, 06). The relationship of the exchange rate with the inflation rate in Algeria during the period 1990.2021 using a model ARDL. Al.Maqrizi Journal of Economic and Financial Studies , pp. 372.389.

Kaddam, E., Amar, A., Aboud, A., & Salim, R. (s.d.). The impact of exchange rate fluctuations on the general general index of stock prices: an applied study in the Iraqi stock market for the period 2005.2011. Department of Financial and Islamic Sciences, University of Karbala, Journal of Management and Economics .

Keddi, A. (2005). Introduction to macroeconomic policies, an evaluative analytical study. Algeria: University Publications Office.

Maachi, M. (2016, Dec 02). An Empirical Study On RealExchange Rate Levels And The Role Of Macro.economic Indicators:Evidence FromAlgeria. University of Echahid Hamma . ELOUED, Algeria.

Madjedi abdelfatah, S. (2002). Treatment of inflation and economic stagnation in Islam. Egypt: Strange house.

saleh, o. (2019). The effects of the exchange rate policy on the level of inflation. Algeria: A dissertation submitted for obtaining a doctorate degree from the Faculty of Economic, Commercial and Management Sciences, Amar Thaliji University of Laghouat.

Samir, F. n. (2011). The interrelationship between the exchange rate and the interest rate and its impact on the balance of payments. Oman: Al.Yarouzi Scientific House for Publishing and Distribution.