Measuring the impact of exchange rate policy on the general level of prices in Algeria for the period 1990-2022 Using a form Ardl

قياس أثر سياسة سعر الصرف على المستوى العام للاسعار في الجزائر للفترة 1990-2022 باستخدام نموذج Ardl

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Abstract:

This study aims to understand the exchange rate and its impact on the general price level in Algeria for the period 1990-2022. It addresses general concepts of the exchange rate and the general price level, and refers to price indices.

We employed both descriptive and econometric methodologies in our study, using the ARDL model to address the research problem. We found that the official exchange rate has a negative impact on the general price level in the short term, and there is an inverse relationship between the official exchange rate and the general price level in the long term.

Key words: *exchange rate, The general level of prices, Records*

الملخص

تهدف هذه الدراسة إلى معرفة سعر الصرف وتأثيره على المستوى العام للاسعار في الجزائر للفترة 1990-2022 وذلك من خلال من التطرق للمفاهيم العامة لسعر الصرف والمستوى العام للاسعار كما اشرنا للأرقام القياسية للأسعار.

وقد إعتمدنا في دراستنا على المنهج الوصفي والقياسي باستخدام نموذج ARDL في معالجة إشكالية الموضوع وقد توصلنا إلى أن سعر الصرف الرسمي له تأثير سلبي على مستوى العام للاسعار في الأجل القصير، هناك علاقة عكسية بين سعر الصرف الرسمي والمستوى العام للاسعار في الأجل الطويل.

الكلمات المفتاحية: سعر الصرف، المستوى العام للأسعار، الأرقام القياسية

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1. INTRODUCTION

The exchange rate is a means of linking the national economy to the global economy, as it expresses the strength of the country's economy and is considered one of the most prominent economic and financial variables. The exchange rate in the exchange market is determined based on the balance between demand and supply, and the central bank plays a major role in controlling the exchange rate through monetary policy. The country's monetary apparatus is sought to influence it with the aim of achieving monetary stability, which is a prerequisite for maintaining the value of the local currency at the international level and countering fluctuations in foreign currencies.

The central bank maintains monetary stability through good management of public prices and balanced growth of the money supply, in line with the growth of commodity production. The fluctuation in the general level of prices has negative effects, both economically and socially. This fluctuation is often in the form of a rise in prices, which can result in negative economic and social repercussions that affect the balance of the financial and monetary system. Volatility rarely takes the form of a decline, but these cases are considered among the most prominent financial and monetary imbalances.

Algeria, like many countries, faces similar challenges. In the 1990s, inflation reached its highest levels. In response, Algeria relied on a set of monetary and financial policies and tools with the aim of controlling and reducing this volatility. These policies included improving liquidity management and price control, in addition to implementing economic reform programs aimed at promoting economic growth and achieving greater financial stability..

Research problem:

We ask, based on the preceding, the following question:

What effect does the exchange rate have on Algeria's overall pricing level between 1990 and 2022?

Search Questions:

This problem is distinguished by the following sub-questions:

- What is the meaning of the exchange rate, and what are its functions?
- What are the mechanisms in place to deal with the overall price increase?
- What effect does the exchange rate have on Algeria's overall pricing level?

Hypotheses for research:

- The exchange rate is the value of one currency being exchanged for another;
- It is dealt with using a set of monetary and fiscal policy instruments;
- The exchange rate has a long-term association with the general price level, and the exchange

rate has a negative short-term influence.

research aims:

- Clarify some concepts connected to the exchange rate; • Knowledge of various notions of the general level of pricing;
- Understanding the nature of the relationship between the Algerian exchange rate and the general level of pricing.

Some previous studies:

- **Hassiba Madani Fatiha Mezrachi 2022**

These studies were intended to investigate the influence of fluctuations in the Algerian dinar's exchange rate against the US dollar on Algerian domestic pricing over the period. (1990-2019) The self-depreciation model ARDL was utilized. The analysis discovered that there was no causal mutual association between the Algerian dinar exchange rate and Algeria's long-term inflation rate. The study also discovered that the exchange rate of the Algerian dinar against the US dollar had a favorable impact on Algeria's short-term inflation rate.

- **Cheloufi Omeyr and Zineb Sabwa 2021**

This study focused on the impact of the exchange rate on inflation in Algeria as a standard study for the period 1980-2018, using the ARDL method, where the study discovered a common complementarity between the two variables in question, indicating that the exchange rate plays an important role in inflationary performance and is considered one of the most important macro-indicators that act as a shock absorber to maintain macroeconomic stability.The study discovered a one-way short-term causal relationship between money supply and inflation rates, as well as a long-term balancing relationship between cash supply in the narrow idea of M1 and cash supply in the broad concept of M2 with INF inflation at a morale level of 5%.

- **Dekkiche Djamel and Ben Bayer Habib 2019**

It attempted to estimate the standard model and investigate the impact of the monetary union on inflation in Algeria as a standard study from 1980 to 2017. The existence of an inverse relationship between the degree of inflation and the gross domestic product. According to the quantitative theory of money, the monetary bloc has a positive and moral impact on the inflation rate.

Research Structure:

- The notion of an exchange rate and the factors that influence it
- Overall price level and control mechanisms
- Standard analysis of the impact of the exchange rate on Algeria's general price level.

2. The notion of an exchange rate and the factors that influence it

2.1 Exchange rate concept:

The exchange rate is defined as the number of national currency units required to buy one unit of foreign currency, or the number of foreign currency units required to buy one unit of national currency[1].

An exchange rate is essentially the price of one monetary unit expressed in terms of another currency unit, such as the US dollar.

It is also defined as the exchange rate at which national monetary units are exchanged for foreign monetary units at any particular time.

The exchange rate is the value at which one currency can be exchanged for another. The exchange rate measures the strength and worth of different currencies in relation to one another. Currency supply and demand, national and global economies, central bank policies, political and economic events, geopolitical variables, interest rate fluctuations, international trade, and other factors all have an impact on the exchange rate.

It has an impact on the strength of exports and state imports, the cost of imported commodities, foreign direct investment, inflation, and the ability to generate deficits or budget surpluses.

Understanding the exchange rate is critical for individuals, businesses, and governments since it has the potential to drastically impact the economy and produce changes in financial and economic conditions.

2.2. Forms of Exchange Rate

2.2. 1 Nominal exchange rate:

An indicator that reflects the average volatility of other currencies for a given currency. The fluctuations in the nominal exchange rate of each country's currency reflect changes in the values of other countries' currencies, and this is given to each. (weighted currency or relative importance consistent with the State's role in monetary relations and international trade).[2]

2.2.2. Real exchange rate:

This is the commercially weighted indicator that combines both nominal exchange rate fluctuations and inflation differentiation rates as it takes into account foreign price fluctuations and their correlation with local price levels[3]

2.2.3 Actual exchange rate:

The indicator, which measures the average change in a currency's exchange rate for several other currencies in a period of time, is therefore equal to the average of several bilateral exchange rates and indicates the extent to which a country's currency has improved or evolved for a group or basket of currencies. Correcting this nominal rate by removing the effects of the relative price changes of the country in question with the outside world, we get the so-called real actual exchange rate.[4]

2.3 Exchange rate functions:

The exchange rate has several functions, including[5]:

2.3.1 Standard Function:

Local producers ONE relies on the exchange rate for the purpose of measuring and comparing domestic prices with global market rates as well as the world exchange rate and prices, as well as the exchange rate for these as the link between domestic prices and world prices.

2.3.2. Developmental Function:

The exchange rate is used to develop certain exports by promoting such exports, and on the other hand, the exchange rate can lead to abandoning, disrupting, or importing those whose prices are lower than domestic prices import ", while an appropriate exchange rate could be relied on to encourage the import of certain goods, As a result, the exchange rate influences the commodity and geographical composition of a country's external commerce.

2.3.3 Distribution Function:

Given that it is related to foreign trade, the exchange rate performs a distribution function at the international economic level, redistributing global national income and wealth across the world's states.

2.4 Factors influencing exchange rate[6]

2.4.1. State's economic policies

2.4.1.1 Money supply: The less expensive the currency, the greater the money supply relative to productivity.

2.4.1.2 Interest Rate:

Indirectly affecting exchange rates, lower interest rates with investment opportunities that increase the demand for capital to invest thereby improving the value of the national currency and vice versa;

2.4.2. Conditions of supply and demand for currency in markets:

Given currencies as a commodity, their price depends on supply and demand balances, inflation and recession. Demand has a direct impact on the currency's exchange rate and supply reversal.

2.4.3 Some technical factors: one of the influences targeting the exchange rate is:

2.4.3.1 Market Conditions:

The extent to which the market is affected by the various economic reports, information and indicators it receives;

2.4.3.2. Customer Experience

Customers' experience, conditions and expectations based on experience of the price direction as they make their decisions in determining their price offers in the light of their analysis of price trends affecting the price trend;

2.4.3.3 Capital Movement:

Structural changes, particularly those related to productive structure, external debt, speculation of wars and disasters, changes in tastes, political and military factors;

2.4.3.4 Money Whitewashing Process:

Its detrimental consequences on the national currency's value. Smuggling of funds overseas raises demand for foreign currency in order to deposit or invest in foreign banks.

2.5 Exchange Rate in Algeria

2.5.1 Gradual Slippage of the Exchange Rate:

This method involved organizing a gradual and monitored depreciation, which was implemented over a relatively long period, from the end of 1987 until September 1992. The reason for this decline was to balance the demand for foreign goods and services with the available foreign currency. The exchange rate of the dinar shifted from 4.9 DZD/USD at the end of 1987 to 17.7 DZD/USD at the end of March 1991. Notably, starting from November 1990, 1 USD equaled 12.11 DZD, indicating an acceleration in the slippage process in line with the pace of reform implementation as per the agreement with the International Monetary Fund (IMF). In February 1991, 1 USD equaled 16.59 DZD. The continued rapid depreciation aimed to stabilize the dinar and facilitate the liberalization of foreign trade, bringing the exchange rate closer to its true value.

2.5.2 The State of the Dinar Exchange Rate after 1994:

At the end of September 1991, the Monetary and Credit Council decided to devalue the dinar by 22% against the dollar, bringing it to 22.5 DZD/USD. The exchange rate of the dinar remained stable around this value until March 1994. However, before the new agreement with the IMF, a

slight adjustment of no more than 10% was made. This decision paved the way for a significant devaluation by the Monetary and Credit Council on April 10, 1994, which devalued the dinar by 40%, resulting in an exchange rate of 36 DZD/USD.[7]

Between 1995 and 1998, the real effective exchange rate of the dinar increased by more than 20%, followed by a decrease of approximately 13% over the next three years. In January 2003, the central bank devalued the dinar by between 2% and 5% to curb the money supply in the parallel market, especially after the widening gap between the official nominal value of the dinar and its value in the black market against foreign currencies. This explains the rise in the dinar's value in 2004, with continued improvement in the national currency's value until 2008 when the exchange rate reached 64.58 DZD/USD. Coinciding with the global financial crisis of 2008 and the drop in oil prices, the purchasing power of the Algerian dinar declined, reflected in an exchange rate of 72.65 DZD/USD in 2009.[8]

The Bank of Algeria intervened in the interbank foreign exchange market in 2011 to maintain the real effective exchange rate at a near-equilibrium level in the medium term, despite increasing fluctuations in major currency exchange rates.

The impact of these fluctuations on Algeria's external debt was minimal due to historically low levels of debt. However, the exchange rate of the Algerian dinar continued to rise sharply, reaching 80.74 DZD/USD in 2014, 100.53 DZD/USD in 2015, and 110.97 DZD/USD in 2017. This indicates a significant and continuous depreciation of the dinar against the US dollar, especially in the parallel market.

In 2019, the Bank of Algeria reported that the dinar's value declined significantly from its 2018 value by more than 12%, due to the euro's appreciation against the dollar in the global market. By the end of 2020, amidst the global COVID-19 health crisis and its economic repercussions, including the continued drop in oil prices and the euro's rise against the dollar, the dinar's exchange rate was heavily influenced by these changes. Consequently, it reached 126.77 DZD/USD in 2020 to offset the reduction in oil revenues and the import bill.

In a presentation to Parliament in 2021, Prime Minister Aymen Benabderrahmane noted that the dinar had depreciated by 6.3% from 2020 to 2021, reaching 142 DZD/USD in 2022, the highest value since the dinar was floated. The war in Ukraine and its impact on oil prices and food security significantly affected its value.

3. Overall price level and adjusting mechanisms

3.1 Overall Price Level Concept:

Each increase in monetary trade would result in an increase in effective aggregate demand over total supply of commodities and products in a given time period, causing the overall price level to rise.[9]

The weighted average price of a country's range of goods and services utilized or consumed is

described as the overall price level.

As can be seen, the "continuous rise in the overall level of prices is accompanied by the depreciation of cash as a result of the amount of cash pumped into the economy

The general price level is an index number, more particularly a price index. This appears to be irrefutable. Irving Fisher and John Maynard Keynes both spent many years debating and writing about how such an index should be defined

The overall price level is defined as the weighted average price of a country's range of goods and services used or consumed[10]

From the foregoing, "continuous rise in the overall level of prices is accompanied by the depreciation of cash as a result of the amount of cash pumped into the economy".

the general price level is that it is an index number, specifically, a price index. This seems unassailable. Irving Fisher spent many years thinking and writing about how such an index should be defined, and the same was true for Keynes[11].

3.2 Methods of measurement

3.2.1 Consumer Price Index (CPI):

Price change analysis is a key part of macroeconomic analysis, and consumer price indices are one of the most important indicators. The consumer price index, which is based on a differentiation between value realities in comparable years, assesses the change in the overall level of prices of goods and services purchased by society for consumption over time. (or current years) and those fixed in a given year as the base year, this year is assumed to be a normal or normal year in terms of market volatility and other conditions prevailing within or around the economy, with a range of goods selected (Consumption basket) to calculate this indicator, calculated. [12]

$$\boldsymbol{CPI} = \frac{\boldsymbol{Market\ basket\ cost\ of\ products\ offered\ at\ comparison\ year\ prices}}{\boldsymbol{Market\ basket\ cost\ of\ products\ offered\ at\ base\ year\ prices}} \times \mathbf{100} \ldots\ldots (\mathbf{1})$$

The consumer price index is one of the most commonly used inflation measures, and it calculates the consumer price index to buy a basket of daily goods and services at different times by assessing each price according to the economic importance of the commodity in question and giving weight to each commodity commensurate with its importance to the budget of consumer expenditures and determined in proportion to total consumer expenditures on that commodity[13].

The Consumer Price Index (CPI) may be used as an indicator of living expenditure, which is a dubious label because it is determined on the basis of urban society rather than society as a whole, it measures the price of a fixed basket of consumer market goods, and in fact consumers replace goods whose prices have risen with relatively lower ones.

3.2.2 Implicit Reduction of GDP (IPD) [14]:

It is a record utilized for calculating the rate of change in the prices of all internal products and services in the computation of GDP, and it is thus a generic measure of annual inflation rates, derived as follows;

$$\boldsymbol{Implicit\ reduction\ of\ GDP\ prices\ (per\ year\ n) = (Nominal\ domestic\ product\ (per\ year\ n))/(Real\ GDP\ in\ the\ same\ year) \times 100} \ldots\ldots (2)$$

It is worth mentioning here that the calculation of price indices requires large statistical devices such as the General Department of Statistics, which usually calculates and publishes them on an annual or biannual basis.

Real GDP from nominal GDP can be calculated from the past relationship as follows:

$$\mathbf{Real\ GDP\ (per\ year) = Nominal\ domestic\ product}\frac{\mathbf{per\ year\ n}}{\boldsymbol{Implicit}}\boldsymbol{Reducer} \ldots\ldots (3)$$

3.2.3 Product Price Indices[15] :

The wholesale price index is the average price change for a certain set of wholesale materials traded over a specified time period. The wholesale price index can reflect a mixture of substances in wholesale exchanges or be limited to a category that was a regular wholesale price figure for food items such as raw materials or imported or exported substances, the numerical of which would have evolved.

The sentence states that a growth in retail prices does not always have to be represented in the measured retail price numbers, which are indicated by the rack and cities. The wholesale price index is generated using any variation of the known weighted index number, with Lasper being the most often used formula for convenience of use and clarity of meaning. calculated as follows:

$$\boldsymbol{I} = \frac{\sum \boldsymbol{p_n q_n}}{\sum \boldsymbol{p_0 q_0}} \times \mathbf{100} \ldots\ldots (4)$$

$\sum \mathbf{p_n q_n}$ Base year valuation for comparison rates or total cash spent in comparison year.

$\sum \mathbf{p_0 q_0}$ Valuation of base year quantities at base year rates or total cash spent in base year .

3.3 Mechanisms for treating high overall price level:

3.3.1 Using Monetary Policy Tools[16]:

Monetary policy implies controlling the Central Bank's supply of money, and its employment of these measures attempts to lower the offer of money for the purpose of speculation, raising the costs of loans provided by the banking system. thereby reducing individuals' willingness to borrow in order to buy and store essential goods that are undersupplied.

The Central Bank relies on a range of quantitative, qualitative and auxiliary tools, especially open market policy, rate of re-deduction, legal reserve ratio and other monetary policy instruments

3.3.2 Using fiscal policy tools[17]:

Fiscal policy is defined as "a set of rules, methods, means, procedures, and measures taken by the State to manage its financial activity as efficiently as possible in order to achieve a set of economic, social, and political objectives during a given period and are used to control and control aggregate economic activity."

Balanced fiscal policy has come to mean budgetary deficits and situations of excess economic activity, such as unemployment or unemployment and recession. Budget deficits are required to attain higher rates of full employment and balanced growth. In the event of inflation, a budget surplus is preferred by cutting government spending to the degree necessary to achieve balance.

4. Index study of the effect of the exchange rate on Algeria's general price level

4.1 The Autoregressive Distributed Lag (ARDL) Model

The ARDL model, introduced by Mohammad Hashem Pesaran, Bahram Pesaran, Yongcheol Shin, and Richard Smith in 2001, is a modern approach used to test the quality of the long-term relationship between a dependent variable and independent variables within an autoregressive distributed lag model framework, also known as the bounds testing approach. This model cannot be used when variables are integrated of order $I_{(2)}$. It requires variables to be integrated of order $I_{(0)}$ and/or $I_{(1)}$ only. [18]

Key Features:

- The ARDL model allows for combining variables that are stationary at the level with those that are stationary at the first difference. It does not require all variables to be stationary at the same level.
- It can identify the cointegrating relationship between the dependent and independent variables in both the short and long term within a single equation, rather than using separate equations.
- All variables in the model can be considered endogenous.
- The ARDL model is more efficient with small sample sizes due to its robustness, unlike traditional cointegration tests which require large sample sizes for efficient results.
- It can determine the magnitude of the impact of independent variables on the dependent variable.
- The model provides an error correction term which measures the model's ability to return to equilibrium after a disturbance.

- The ARDL approach addresses issues related to autocorrelation, ensuring that the obtained results are efficient and unbiased.

The bounds testing approach developed by Pesaran et al. (2001) integrates autoregressive models with distributed lag models, making the time series a function of its lagged values and the current and lagged values of the explanatory variables.

4.2. Requirements for Applying the ARDL Method: [19]

The primary requirements for applying the ARDL method are:

- The ARDL method can be applied regardless of whether the variables are stationary at level (0)I or first difference (1)I, or a mix of both. This helps avoid issues related to standard cointegration analysis which requires all variables to be stationary at the same level, such as all at (0)I. The only condition is that the time series should not be integrated of order (2)I.
- If the F-statistic (Wald test) proves the existence of a single long-term relationship, and the sample size is small or limited, the error correction representation of ARDL becomes more effective.
- If the trace test, maximum eigenvalue, or F-statistics indicate the presence of a single long-term relationship, the ARDL method can be applied instead of the Johansen or Engle and Granger tests.

4.3. Characteristics of the ARDL Method: [20]

The ARDL method has several advantages over other estimation methods:

- The ARDL method relies on the Schwarz Bayesian Criteria (SBC) to determine the optimal lag length.
- The ARDL model provides an Error Correction Model (ECM) result which measures the model's ability to return to equilibrium after a disturbance.
- It estimates the model by identifying the cointegrating relationship between the dependent and independent variables in both the short and long term within the same equation, as well as determining the impact of each independent variable on the dependent variable.
- It addresses issues related to autocorrelation, ensuring efficient and unbiased results.
- The preference for the ARDL model (Pesaran et al., 2001) over other well-known cointegration models like Johansen (1998) or the two-step method by Engle and Granger (1987) is due to the uncertainty about the properties and stability of time series. The Pesaran bounds testing approach is preferred as it does not require time series to be integrated of the same order.

We can suggest the following default form:

$$Ly_t = b_0 + b_1 Lx_t \quad \dots\dots (5)$$

Where:

$\mathbf{Ly_t}$: Logarithm Inflation Rate

$\mathbf{Lx_t}$: Logarithm Official Exchange Rate

4.4 Stabilization Study

Table 1. ADF test results

Variables	At level			At the first difference		
	constant	Constant and general direction	No Fixed No General Direction	constant	Constant and general direction	No Fixed No General Direction
LY	-2.634274 (0.0968)*	-2.573595 (0.2938)*	-1.280924 (0.1802)*	-7.821402 (0.0000)*	7.911771- (0.0000)*	-7.938014 (0.0000)*
LX	-5.978908 (0.0000)*	-2.120278 (0.5113)*	2.434706 (0.9953)*	-6.517263 (0.0000)*	-6.277016 (0.0001)*	-5.970886 (0.0000)*

Source: *Prepared by the researcher on the basis of the Eviews9's outputs (annex 01)*

* The probability value represents at 5%

By reading Table 01 (ADF Unit Root Test), it is clear to us that the hypothesis of nowhere is acceptable, i.e. the variables are unstable at the level because of the Unit root, stable at the first difference because there is no Unit root, i.e. all study variables are first class integrated (I (1)).

4.5. Joint integration test using border methodology:

The following table shows the results of a statistical calculation (F):

Table 2. Border Test (F Bounds test)

Test statistic	value	K	Moral (%)	I(0)	I(1)
F	29.53	1	10	4.04	4.78
			5	4.94	5.73
			2.5	5.77	6.68
			1	6.84	7.84

Source*: Prepared by the student based on the outputs of the Eviews9 programmer*

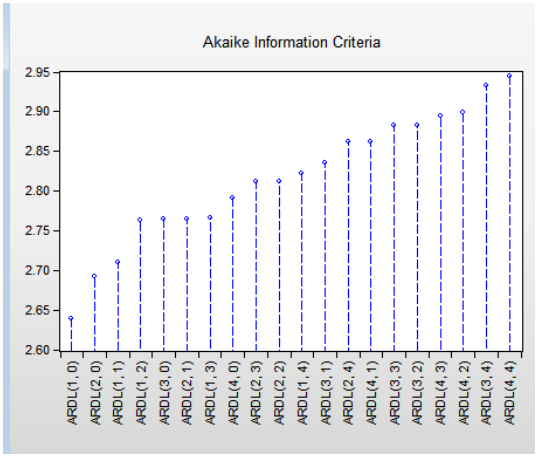
We can see from the previous table that the statistical (F) value is outside of areas I (0) and I

(1) at all levels, indicating a long-term balance between research variables.

4.6. Long-term balance:

In order to choose the right ARDL model for study we use the SIC standard, and we get the following format:

Fig.1. SIC Standard



Source: *Prepared by the student based on the outputs of the Eviews9 programme*

Figure 01 shows us that the appropriate model for SIC study is ARDL (1.0), since it has the smallest value of the said standard.

Table 3. ARDL Model (2.4.2.4)

Variable	Teacher	Standard deviation	t-Statistic	Probability *
DLOGY(-1)	-0.354549248	0.17599211	-2.01457467	0.05364448
DLOGX	-0.353877169	1.47164718	-0.24046332	0.81172303
C	-0.019379737	0.17719276	-0.10937093	0.91368838

(R2=0.1276), (F-statistic=2.04 Pro=0.147), (SIC=2.6865)

Source: *Prepared by the student based on the outputs of the Eviews9 programme (attachment 02)*

The table shows that the DLOGY indicator is negative, indicating an inverse relationship between the general price level and the official exchange rate, and statistically acceptable, whereas the DLOGX indicator is negative, indicating an inverse relationship between the general price level and the official exchange rate, even if statistically acceptable.

We can see from the 2R determination coefficient that 12.76% of the overall price level fluctuations are decided from within the model, implying that the variables of the interpreted model are the official exchange rate. Fisher's test also shows that the model's overall morale is not

acceptable at the 5% threshold, indicating that the model is poor.

4.7. Error Rating Form:

To select the right ARDL form for study we use the SIC standard, and we get the following table:

Table 4. Error Correction Model

Variable	Teacher	Standard deviation	t-Statistic	Probability *
D(DLOGX)	-0.353877169	1.47164718	-0.24046332	0.8117
CointEq(-1)	1.354549248-	0.17599211	-7.69664758	0.0000

Cointeq = DLOGY - (-0.2613*DLOGX -0.0143)

Source: *Prepared by the student based on the outputs of the Eviews9 programme (attachment 03)*

We observe from table 04 that the official exchange rate parameter is negative, suggesting that the official exchange rate has a negative impact on the overall level of short-term pricing. The error correction parameter is equal to -1.3545, indicating that its signal is negative and moral at the 5% level. This improves the accuracy and validity of the long-term balance relationship, as well as indicating that the error correction mechanism exists in the model and the parameter measures the speed of the long-term balance reference. This outcome is consistent with past research findings.

Table 5. Long-term parameters

Variable	Teacher	Standard deviation	t-Statistic	Probability *
DLOGX	-0.261250869	1.08626712	0.24050334-	0.81169232
C	0.014307148-	0.13079746	-0.109384	0.91367811

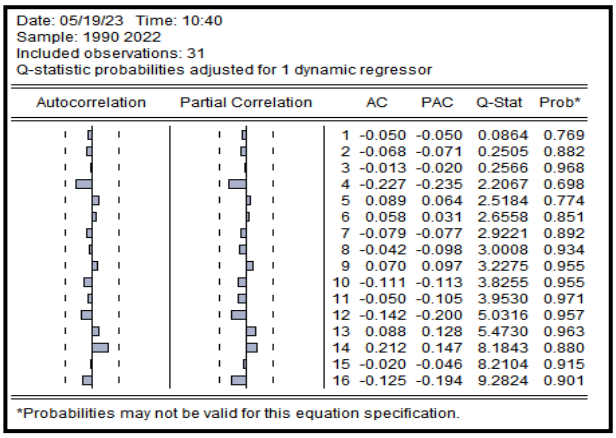
Source: *Prepared by the student based on the outputs of the Eviews9 programme (attachment 03)*

$$\boldsymbol{Ly_t = -0.014307148 - 0.261250869LOGX_t} \ldots\ldots..(\mathbf{06})$$

By reading Table No. (05) and Equation No. (05) we note that the official exchange rate parameter is negative and statistically acceptable, i.e. there is a reverse relationship between the official exchange rate and the general long-term price level, where if the exchange rate rises by one unit the overall price level decreases by 26.13%.

4.8. Bouquet Test:

Fig.2. Barrier Test



Date: 05/19/23 Time: 10:40
Sample: 1990 2022
Included observations: 31
Q-statistic probabilities adjusted for 1 dynamic regressor

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	-0.050	-0.050	0.0864	0.769
		2	-0.068	-0.071	0.2505	0.882
		3	-0.013	-0.020	0.2566	0.968
		4	-0.227	-0.235	2.2067	0.698
		5	0.089	0.064	2.5184	0.774
		6	0.058	0.031	2.6558	0.851
		7	-0.079	-0.077	2.9221	0.892
		8	-0.042	-0.098	3.0008	0.934
		9	0.070	0.097	3.2275	0.955
		10	-0.111	-0.113	3.8255	0.955
		11	-0.050	-0.105	3.9530	0.971
		12	-0.142	-0.200	5.0316	0.957
		13	0.088	0.128	5.4730	0.963
		14	0.212	0.147	8.1843	0.880
		15	-0.020	-0.046	8.2104	0.915
		16	-0.125	-0.194	9.2824	0.901

*Probabilities may not be valid for this equation specification.

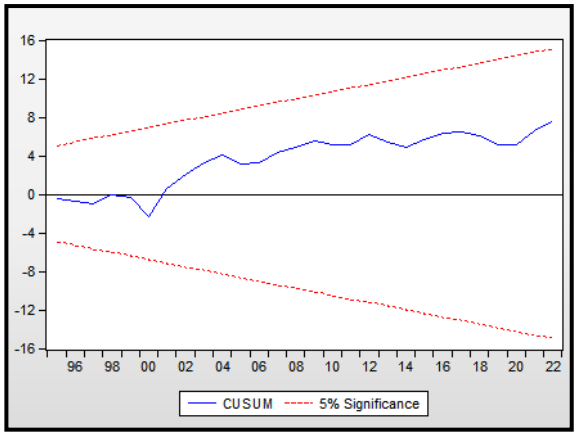
Source: *Prepared by the student based on the outputs of the Eviews9 programme*

According to the Correlogram of reside, the retention represents a white leaf.

4.9 Model Stability Test:

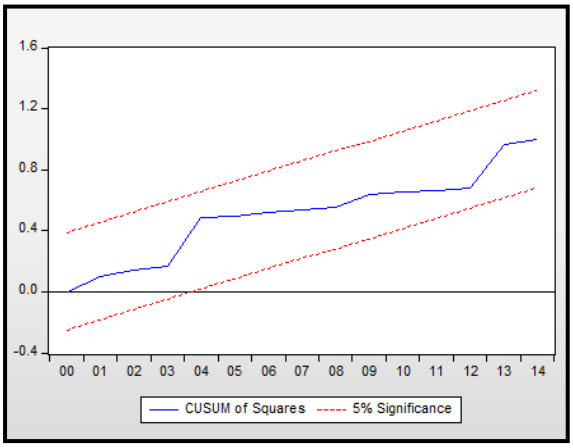
To make sure that the variables studied and the model as a whole do not have structural changes, we use the cumulative total test for returning retainers CUSUM and CUSUM of Squares are two of the most important tests in this area because they demonstrate the existence of any structural change in data, the stability and consistency of long-term parameters with short-term parameters, and many studies have shown that such tests are always accompanied by CUSUM.

Fig.3. Cumulative Total of Return Parcels (CUSUM)



Source: *Prepared by the student based on the outputs of the Eviews9 programme*

Fig.4. CUSUM of Squares



Source: *Prepared by the student based on the outputs of the Eviews9 programme*

Through diagrams 03 and 04, we note that the cumulative total test of CUSUM return protectors for this model, It crosses a linear medium within the boundaries of the critical area indicating a kind of stability in the model at a morale limit of 5% the same for the cumulative total test of CUSUMSQs. approach ", where it is clear from these tests that there is stability and harmony in the model between long-term and short-term outcomes.

5. Conclusion:

Finally, it could be argued that the exchange rate could affect Algeria's overall price level in a variety of ways, because Algeria was one of the countries that relied heavily on imports of goods and raw materials, therefore any change in the exchange rate could affect the cost of such materials as well as reflect the prices of domestic products.

When the exchange rate of Algerian dinars for foreign exchange falls, the cost of imported raw materials and goods rises, resulting in higher pricing. This cost rise could be passed on to consumers in the form of higher pricing for domestic products and services, adding to higher inflation.

Furthermore, the exchange rate may have an impact on Algerian exports. When the exchange rate rises, Algerian items become more expensive in worldwide markets, lowering demand and exports. This could result in a drop in foreign exchange income and have a negative impact on the economy as a whole.

Results:

- Long-term equilibrium between the official exchange rate and the overall price level;
- the official exchange rate has a negative impact on the overall level of short-term pricing.
- The official exchange rate and the total long-term price level have an inverse relationship.
- The model has stability and harmony between long-term and short-term results.

Recommendations:

- Adopt policies to achieve exchange rate stability.
- Utilize effective monetary policy tools.
- Improve reserve management to maintain currency stability.
- Ensure adequate reserves are available for foreign exchange market intervention.
- Reduce reliance on oil exports.
- Strengthen the agriculture, industry, and tourism sectors.
- Increase transparency and disclosure of monetary decisions.
- Publish accurate data on exchange rates and inflation.
- Enhance cooperation with international financial institutions.
- Benefit from the experiences of other countries.
- Strengthen regulation of the financial market.
- Organize awareness campaigns about the impact of exchange rate fluctuations.
- Provide guidance to companies on hedging against exchange rate risks.

By implementing these recommendations, the paper can significantly improve its methodological rigor and clarity. This will enhance the robustness and credibility of the findings, making the study more valuable to policymakers and researchers interested in the impact of exchange rate policies on inflation.

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6. Appendices

Appendices 1.ARDL bound test

ARDL Bounds Test
Date: 05/15/23 Time: 09:32
Sample: 1992 2022
Included observations: 31
Null Hypothesis: No long-run relationships exist

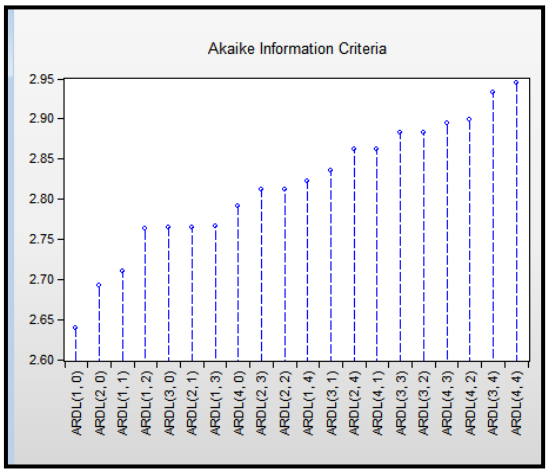
Test Statistic	Value	k
F-statistic	29.53948	1

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	4.04	4.78
5%	4.94	5.73
2.5%	5.77	6.68
1%	6.84	7.84

Source: *Eviews9 programme*

Appendices 2.AKaike information criterion



Source: *Eviews9 programme*

Appendices 3. Estimated model

Dependent Variable: DLOGY
Method: ARDL
Date: 05/15/23 Time: 09:32
Sample (adjusted): 1992 2022
Included observations: 31 after adjustments
Maximum dependent lags: 4 (Automatic selection)
Model selection method: Akaike info criterion (AIC)
Dynamic regressors (4 lags, automatic): DLOGX
Fixed regressors: C
Number of models evalulated: 20
Selected Model: ARDL(1, 0)
Note: final equation sample is larger than selection sample

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
DLOGY(-1)	-0.354549	0.175992	-2.014575	0.0536
DLOGX	-0.353877	1.471647	-0.240463	0.8117
C	-0.019380	0.177193	-0.109371	0.9137

R-squared	0.127667	Mean dependent var	-0.033040
Adjusted R-squared	0.065358	S.D. dependent var	0.854593
S.E. of regression	0.826195	Akaike info criterion	2.547793
Sum squared resid	19.11273	Schwarz criterion	2.686566
Log likelihood	-36.49079	Hannan-Quinn criter.	2.593029
F-statistic	2.048919	Durbin-Watson stat	2.066362
Prob(F-statistic)	0.147758		

*Note: p-values and any subsequent tests do not account for model selection.

Source: *Eviews9 programme*

Appendices 4. Long –term relationship estimation

ARDL Cointegrating And Long Run Form
Dependent Variable: DLOGY
Selected Model: ARDL(1, 0)
Date: 05/15/23 Time: 09:35
Sample: 1990 2022
Included observations: 31

Cointegrating Form

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(DLOGX)	-0.353877	1.471647	-0.240463	0.8117
CointEq(-1)	-1.354549	0.175992	-7.696648	0.0000

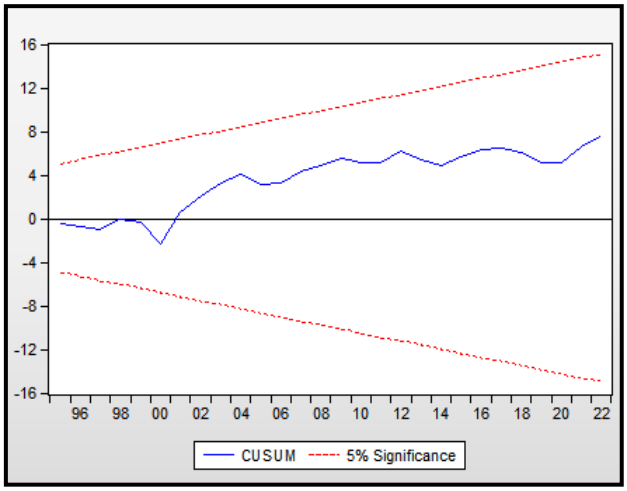
Cointeq = DLOGY - (-0.2613*DLOGX -0.0143)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
DLOGX	-0.261251	1.086267	-0.240503	0.8117
C	-0.014307	0.130797	-0.109384	0.9137

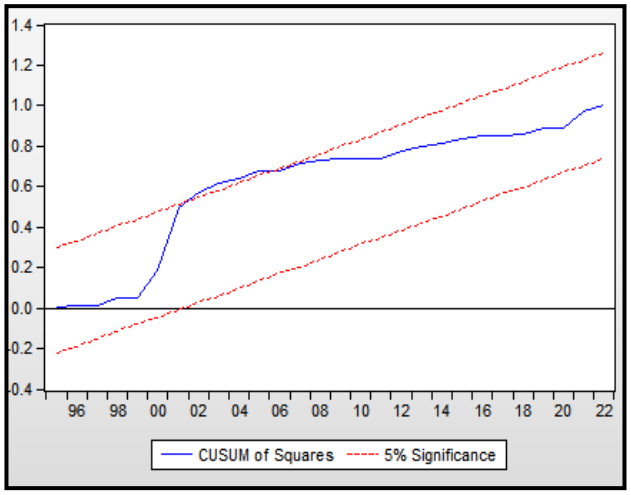
Source: *Eviews9 programme*

Appendices 5.CUSUM



Source: *Eviews9 programme*

Appendices 6.CUSUM of Squares



Source: *Eviews9 programme*