Determinants of inflation in Algeria during the period of 1970-2022, an empirical study using the ARDL model

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Abstract:

This study aims to identify the most important economic variables determining inflation in Algeria during the of period 1970-2022, and to achieve this, the concept, types and the most important theories explaining inflation were addressed at the beginning, then an econometric study was carried out to equate the determinants of inflation based on the autoregressive distributed time lag model ARDL.

The results of the study revealed the existence of a long-term relationship between inflation and GDP, imports and the exchange rate. The study also found that the exchange rate is a basic determinant of inflation in the short and long terms for the Algerian economy during the study period.

Keywords: Inflation, Determinants of inflation, Algeria, ARDL.

Jel Classification Codes :C13;C32;E37

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1. Introduction :

We can say that the phenomenon of inflation is one of the most important points in the Algerian economy, due to its effects that cast a shadow on the economic and social levels. .

Algeria, like all countries, suffered from the effects and repercussions of the phenomenon of inflation, which is generally represented by high prices accompanying a decrease in purchasing power, which forced it to adopt many reform policies within the monetary policy mechanisms as a tool to control inflation rates and control it in order to achieve price stability.

Algeria, like other countries, suffered from many economic problems, such as the phenomenon of severe inflation, which prevented its progress in various fields of development, and given that its economy is closely linked to oil prices, the oil shocks that the Algerian economy is exposed to, as oil prices tend to decline, which has negative effects. Its most important manifestations were represented in the rise in inflation rates to a level that constituted a real impediment to the path of development within the framework of incoherent economic policies.

The unprecedented rise in oil prices, which inevitably leads to an increase in oil revenues and encourages the state to launch several economic programs, has an impact on the high rates of economic growth, aggregate demand and inflation.

Intellectuals have had conflicting views on explaining this phenomenon and identifying the factors causing it, especially since it differs from one country to another according to the nature of each country's economy and by virtue of the strength or weakness of its conditions. Developing countries, with their fragile economies, are more affected by inflation than developed countries.

Therefore, trying to control the phenomenon of inflation has become one of the most important challenges facing economists, as most of them have tried to model it and formulate it in mathematical and statistical models to determine the reasons for it and the economic variables affecting it and the consequences arising from it, and not being satisfied with presenting it as a problem only and studying it to make decisions in a superficial and abstract way, regardless of the style Estimation and measurement, with the increasing importance of using quantitative methods in macro or partial economic analysis, and econometrics is one of the most important analysis methods used.

1.1. Study problem:

In light of the above, an attempt to find out the determinants of inflation using economic measurement, we ask the following question: **What are the determinants of inflation in Algeria during the period 1970-2022?**

1.2. Study hypotheses:

- Inflation in Algeria is affected by a group of macroeconomic variables such as monetary mass, wage mass, gross domestic product, exports, imports, and the exchange rate.

1.3. the importance of studying:

The study is of great importance due to the great position that the phenomenon of inflation enjoys on the ground of economic thought on the one hand, and to the great dangers that affect the national economy on the other hand, whether at the macro level on the outputs of economic activity such as dire effects on growth, work, unemployment...etc. Or at the micro level, the high prices exhaust workers and the unemployed alike, albeit to varying degrees.

1.4. Objectives of the study:

This study seeks to achieve several objectives, including:

- Studying the economic theories on which the economic thought of inflation relies in order to benefit from it.
- Determining the most important variables affecting inflation in Algeria.

Understanding the nature of the relationship between macroeconomic variables and inflation.

- An econometric study according to the ARDL model to represent the Algerian reality during the period **1970-2022.**

1.5. Study methodology:

The methodology of this study is based on the analytical descriptive approach in analyzing the inflation phenomenon, and we will also rely on quantitative analysis tools to estimate the inflation function during the study period, using the ARDL autoregressive distributed time delay model.

As for the data used in the form, it is annual data for the Algerian economy during the period 1970-2022 and its source is the database of the World Bank.

1.6. Study Structure:

We divided the study into two main parts, where we dealt in the first part with the conceptual framework of inflation, including its determinants, according to the positive theories of inflation, and in the second part, the standard study of co-integration according to the ARDL model.

2. The conceptual framework of inflation:

Researching the concept of inflation, its types, and adjusting its determinants according to the theories that explain it is considered a major priority for drawing up economic policies and using various methods to limit its exacerbation, and to achieve the stability that countries aspire to, regardless of their different degrees of development and different economic systems.

Most of the studies and research in monetary and financial economic thought have been linked to the issue of inflation, as it is the most important economic phenomenon that affects developed and developing

countries alike, because of its intertwined relationships with various economic and social aspects such as price levels, development levels, and economic growth rates.

2.1. Definition of Inflation:

The historical development of the phenomenon of inflation was of great importance, and its features appeared in the last century during the First World War when the legal link between the paper currency and the gold cover was interrupted, which revealed the end of the main severe limitation of the authority of the monetary authorities to set real controls and measures for the cash available in the market. In exchange for goods and services, which produces multidimensional effects and raises many theoretical and applied issues, which made defining an accurate and unified concept of this phenomenon difficult due to the different opinions of economic thinkers according to their intellectual currents and schools to which they belong according to the following:

- According to Gander Ackeley, inflation: **"It is a state of continuous and perceptible rise in prices, not high prices, or in other words, inflation expresses a state of imbalance, and it must be analyzed according to dynamic criteria and not static criteria"**. (Hathat, 2006, p. 27).

As for Emele James, he believes that inflation: **"is an upward movement of prices characterized by self-continuity resulting from excess demand in excess of supply capacity."**(Majed abdelfatah, 2002, p. 37)

- As for A.C. Pigou believes that the condition of inflation is available when it becomes: **"The increases in money income are greater than the increases in the amount of production achieved by using the factors of production that obtain those incomes."**(Elmoussawi, 2000, p. 215)

- G.OLIVE, which believes that: **"The rise in the general level of prices is not the rise in the prices of some commodities, an increase that generates other increases**."(Bremoud & Alain, 1981, p. 212)

2.2. Types of inflation: Inflation can be divided into:

2.2. 1. According to the state's ability to control the price system: Two main types can be identified:

-Repressed (restricted) inflation: It is a situation in which the general level of prices remains low by one means or another, but this stability is at the expense of a strong accumulation that can cause an explosion in prices at a later stage. This type of inflation prevails in countries in which the state dominates. It affects the economy, and it occurs in the event that effective demand exceeds the available supply of goods and services, especially when the state issues money and puts it into circulation without cover from production, gold, or foreign currencies, and it is logical in this case that prices rise.

-Free inflation: This type of inflation is characterized by a continuous and permanent rise in price levels without the state taking any measures to reduce them. between supply and demand. In addition to the lack of interference by the state.

2.2. 2. According to the intensity of inflationary pressures: The following types can be identified:

-Creeping inflation: It is characterized by a slow rise in prices at the limits of 2%. The increase in prices is permanent and successive and does not lead to violent processes in the short term.

- Walking inflation: This inflation occurs when there is a continuation of the rise in prices at the range of 5 to 10% annually, and its danger lies in the possibility of these rates developing to higher levels.

-Galloping inflation: it is between running inflation and hyperinflation (i.e. between 10 and 50%), and it is extremely dangerous for various economic and social indicators.

- Unbridled inflation: It is the most dangerous type of inflation and the most harmful to the national economy, in which prices rise to the limits of close to or exceeding 50%, which affects devastatingly the purchasing power of the monetary unit, and accelerates its abandonment as a measure of value and a means of deferred payments.(Inaya, 2000, p. 92)

2.3. Determinants of inflation according to the interpretation of various economic theories:

Due to the multiplicity of ideas about the concept of inflation, there have been many theories that have tried to explain the reasons behind the emergence of the phenomenon of inflation, as a distinction has been made between three main theories:

2.3. 1. Demand Side Theories:

-Classical analysis of inflation: The classics, the neoclassicals, and the monetarists were concerned with the role of money and the reasons for its expenditure. According to them, the demand for money is nothing but a demand derived from the demand for goods and services. Therefore, money has no function other than that it is a medium of exchange, and therefore there is a strong relationship between money and prices. The classic study of the relationship Between money and inflation You see that a change in the amount of money supplied leads to a similar change in the general level of prices and thus inflation.

-Keynesian analysis of inflation: Keynes assumes that the levels of effective aggregate demand are determined at any level of operation, and stability can be achieved by creating a balance between aggregate demand and aggregate supply, and any imbalance in that balance is determined by the movements of the levels of effective aggregate demand relative to the levels of full utilization, and expresses the rise of this Demand is above the full inflation level .(Ben zayen, 2010, p. 111)

But if the aggregate demand increases significantly, leading the economy to reach the stage of full operation, and the increase in demand continues after this stage, the result will be a continuous rise in prices .(Alwadai, 2010, p. 61)

- Inflation in light of the modern quantitative theory: Friedman reaffirmed the traditional quantitative theory of money, as he believes that inflation is always and wherever it is a monetary phenomenon.

Where inflation occurs, according to the analysis of the Chicago School, as a result of an increase in the amount of money in circulation in relation to the quantity of production, which leads to an increase in the share of the produced unit in the amount of money in circulation, and from it pushes the general level of prices towards an increase.(Nadres, 1984, pp. 247-249)

Friedman believes that there is a relationship in the same direction between changes in the quantity of money and changes in the price level, and that monetary change is the important factor in determining price changes. Production and changes in the amount of money desired to be kept by individuals, as Friedman highlighted that price stability requires achieving appropriate harmony between the growth rate of money and the rate of growth in production and population(Gilles j. , 1997, p. 02)by paying attention to the role and importance of monetary policy in addressing economic crises And the need to link the growth in the quantity of money to the equivalent of the growth in the real national product(Milton & Charles, 2003, p. 84)in order for it to have an impact on prices, that is, the tight monetary policy aimed at curbing inflation has a limited effect in the short term, but its effect appears in lowering prices. after a long time.

2.3 2. Supply-side theories (cost-driven inflation):

This theory is concerned with analyzing the supply side more than the demand side, especially in the developed capitalist countries, where the owners of this theory believe that the reason behind the emergence of the phenomenon of inflation is due to the rise in production costs without a change in the volume of aggregate demand.(André & Jean, 1975, p. 29)

Producers may resort to a policy aimed at achieving high rates of profits, while workers, through trade unions, demand and pressure producers and employers to increase wages, which leads to an increase in production costs, and then producers, in turn, increase prices to compensate for the increase in costs. Production as a result of the increase in wages(Javed, 2010, p. 309), and so the increases in prices and wages continue so that the wages and prices curve do not meet at a certain level and a so-called (wages-price) loop appears. The rise in costs may be due to the inflation of both wages and profits. For companies, imported inflation, the rise in prices of domestic production inputs and expectations.(Alwadi & Alassawi, 2007, p. 156)

2.3. 3. Structural Theory:

This theory, attributed to the structural or constructivist school, led by Raoul Britsch, indicates that to explain inflation in developing countries, one must first search for the nature of the structural imbalance existing in the economy, and that the structural and social factors that cause the emergence of these factors.(Bin aissa & Bin yashu, 2015, p. 47)

The imbalance of the economic structure and the inequality in the growth of all economic sectors, the level of productivity and scientific competencies(Kanaan, 2012, p. 297)all lead, according to this school, to actual and

real imbalances in the structure of the national economy and how economic resources are distributed and exploited.(Alkawaz, 2010, p. 05)

The most important manifestations of the economic imbalance can be limited to the deficit of the financial apparatus of developing countries and the restrictions related to the foreign exchange markets, and in light of the inflexibility of the productive apparatus in developing countries, the inflationary gap increases and price levels rise.

3. Standard study of inflation determinants in Algeria during the period 1970-2022:

We chose the Algerian economy as a model and a sample for the study with regard to the determinants of inflation, by relying on the database of the World Bank during the period 1970-2022 and using the ARDL model and relying on the Eviews 9 program.

3.1 Study model and variables:

Here we will try to present the standard study of the determinants of inflation in Algeria during the period 1970-2022, based on economic theory and previous applied studies, to estimate the model in its mathematical form as follows:

$$Linf = f(Ltch, Lpib, Lim, Lex) \quad \text{.....(01)}$$

where:

- **Linf**: the logarithm of inflation, which is the dependent variable.
- **Ltch: The logarithm of the exchange rate of the Algerian dinar against the US dollar, which is one of the independent variables.**
- **Lpib: The logarithm of the gross domestic product, which is one of the independent variables.**
- **Lim: Logarithm of imports and is one of the independent variables.**
- **Lex: The logarithm of exports, which is one of the independent variables.**

The standard study relied on the use of the Autoregressive Distributed Time Delay (ARDL) model, based on a series of annual data during the period 1970-2022 derived from the World Bank database.

3.2. Cointegration Methodology Using ARDL Model:

For reference only, all previous variables were given in real values, and to achieve homogeneity between the study variables and units of measurement, the logarithm was entered on the original data studied, and in order to study the long and short term relationship between the variables under study, we apply the ARDL technique, which was developed by Pesaran and Shin (1999). and Pesaren, Shin and Smith (2001) This method has three advantages over cointegration methods such as Johansen method and Engel-Granger method, it does not need to beAll the variables under study are integrated of the same degree, so it can be applied when all the variables are integrated of the first degree or integrated of the zero degree, or there is a mixture of integrated

variables of the first degree and the zero degree, provided that they are not stable of the second degree, and the ARDL test is more Relatively efficient in the case of small or limited samples, and it is also allowed to obtain unbiased estimates in the long-term model, and from it the model that addresses the determinants of inflation in Algeria can be written as follows:

$$\Delta linf_t = \beta_0 + \sum_{t=1}^{\rho} \beta_{1t} \Delta linf_{t-1} + \sum_{t=1}^{q1} \beta_{2t} \Delta ltch_{t-1} + \sum_{t=1}^{q2} \beta_{3t} \Delta lpib_{t-1} + \sum_{t=1}^{q4} \beta_{5t} \Delta lex_{t-1} + \propto_1 linf_{t-1} + \propto_2 ltch_{t-1} + \propto_3 lpib_{t-1} + \propto_4 lim_{t-1} + \propto_5 lex_{t-1} + \varepsilon_t \quad \text{.....(02)}$$

where:

Δ: first-order differences. β_i: coefficients of the short-term relationship.

β_0: constant limit. α_i: long-run relationship coefficients.

p, q_i: the upper limit of the time lag periods. ε_t: random error term.

t: time.

3.3. Standard Analysis Using ARDL Model:

Where the unit root and cointegration are tested in addition to the diagnostic tests of the study variables.

3.3. 1. Unit root tests for the study variables:

Testing the stability of time series is a necessary condition of co-integration for the application of the ARDL model to be applied correctly, so the unit root was tested according to the ADF test and the PP test.

Table 01 shows the statistical results obtained by applying the expanded ADF test and the PP test at a significant level of 5% for the original series under study, and includes the critical values for each test at this level.

Where it became clear to us that the chains are unstable and contain a unit root, given that the value calculated in absolute terms is completely less than the critical value of Mackinnon in absolute terms, although this does not apply to the first and second models regarding inflation, and this is in application of the principle of statistical tests stipulating that if one Forms indicates the presence of a unit root the series is unstable.

As for the next step, it is the application of the expanded ADF test and the PP test at a significant level of 5% for the studied series at first-order differences. Table 02 shows the statistical results that were reached as a result of the two previous tests.

Where the results indicate that the series transformed by first-order differences are stable, given that the calculated value in absolute terms is completely greater than the critical value of Mackinnon in absolute terms, and what reinforces this result is the critical probability values smaller than 5%, these results support the standard theory that states Most of the macroeconomic variables are always unstable at the level, but they become stable at first-order differences.

Table 01: Results of the stability test for inflation and the rest of the variables

test type	ADF test H_0:exists a unit root			PP test H_0 :exists a unit root		
test form	(1)	(2)	(3)	(1)	(2)	(3)
critical value	-1.94	-2.93	-3.52	-1.94	-2.93	-3.52
The computed value is LINF	-2.67	-3.14	-3.30	-1.01	-3.16	-3.31
Calculated valueLTCH	-1.55	-0.48	-1.64	1.66	-0.42	-1.80
Calculated value LPIB	0.04	-1.30	-1.28	0.03	-1.39	-1.33
Calculated valueLIM	-0.53	-2.12	-1.68	0.53	-2.12	-1.66

Source: prepared by the researcher based on the outputs of the Eviews 9 program

Table 02: Results of the stability test for inflation and the rest of the variables at first-order differences

test type	ADF test H_0:exists a unit root			PP test H_0 :exists a unit root		
test form	(1)	(2)	(3)	(1)	(2)	(3)
critical value	-1.94	-2.93	-3.52	-1.94	-2.93	-3.52
The computed value is LDINF	-9.74	-9.65	-9.55	-9.78	-9.69	-9.59
Calculated value LDTCH	-3.92	-4.50	-4.45	-4.14	-4.46	-4.60
Calculated value LDPIB	-6.67	-6.61	-6.63	-6.67	-6.61	-6.63
Calculated value DLIM	-7.35	-7.34	-7.55	-7.35	-7.34	-7.55

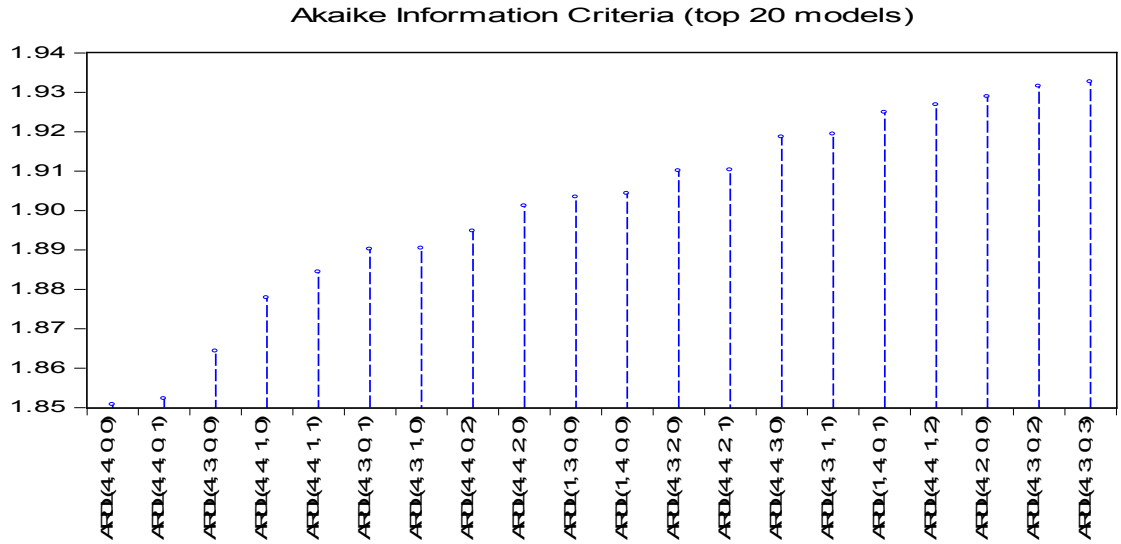
Source: prepared by the researcher based on the outputs of the Eviews 9 program

This means that there is a possibility of a first-order integration between inflation and the rest of the variables, and for this reason, the ARDL model is appropriate to represent the relationship between the variables.

3.3. 2. Cointegration tests using the Bounds Test:

In order to test the cointegration relationship between the study variables, the (ARDL) model must be estimated. The (AIC) criterion has been relied upon to determine the optimal time delays. The appropriate model is the one through which the lowest value of this criterion is obtained. The appropriate model according to Figure 01 is the ARDL (4, 4, 0, 0).

Figure 01: Determination of the number of delays in the ARDL model



Source: prepared by the researcher based on the outputs of the Eviews 9 program

The cointegration relationship between the variables of the study is tested within the framework of the (UECM) model by estimating the previous model:

$$\Delta linf_t = \beta_0 + \sum_{t=1}^{\rho} \beta_{1t} \Delta linf_{t-1} + \sum_{t=1}^{q1} \beta_{2t} \Delta ltch_{t-1} + \sum_{t=1}^{q2} \beta_{3t} \Delta lpib_{t-1} + \sum_{t=1}^{q4} \beta_{5t} \Delta lex_{t-1} + \propto_1 linf_{t-1} + \propto_2 ltch_{t-1} + \propto_3 lpib_{t-1} + \propto_4 lim_{t-1} + \propto_5 lex_{t-1} + \varepsilon_t \quad \text{.....(02)}$$

The null hypothesis that there is no cointegration (a long-term equilibrium relationship) between the variables is tested as follows:

$$H_0 = \alpha_1 = \alpha_2 = \alpha_3 = 0$$

Against the alternative hypothesis that there is a long-run cointegration relationship:

$$H_1 \neq \alpha_1 \neq \alpha_2 \neq \alpha_3 \neq 0$$

Table 03: Results of the ARDL Bounds Test

ARDL Bounds Test
Date: 07/15/23 Time: 19:24
Sample: 1974 2020
Included observations: 47
Null Hypothesis: No long-run relationships exist

Test Statistic	Value	k
F-statistic	9.241362	3

Critical Value Bounds

Significance	I0 Bound	I1 Bound
10%	2.72	3.77
5%	3.23	4.35
2.5%	3.69	4.89
1%	4.29	5.61

Source: prepared by the researcher based on the outputs of the Eviews 9 program

Through Table 03, which shows the results of the ARDL Bounds Test, it is clear that the statistical value (F-statistic) is equal to 9.241362, which is greater than the critical values for the upper limit at a significant level, 1%, 10%, 5%, 2.5%, and as a result, it will be Acceptance of the alternative hypothesis, which states that there is a cointegration relationship in the long run.

3.3. 3. Diagnostic tests of the form:

After estimating the model, a set of diagnostic tests must be conducted to verify the existence of some standard problems affecting the validity and strength of the estimated model, through the following table according to Appendix 02:

Table 04: Results of diagnostic tests

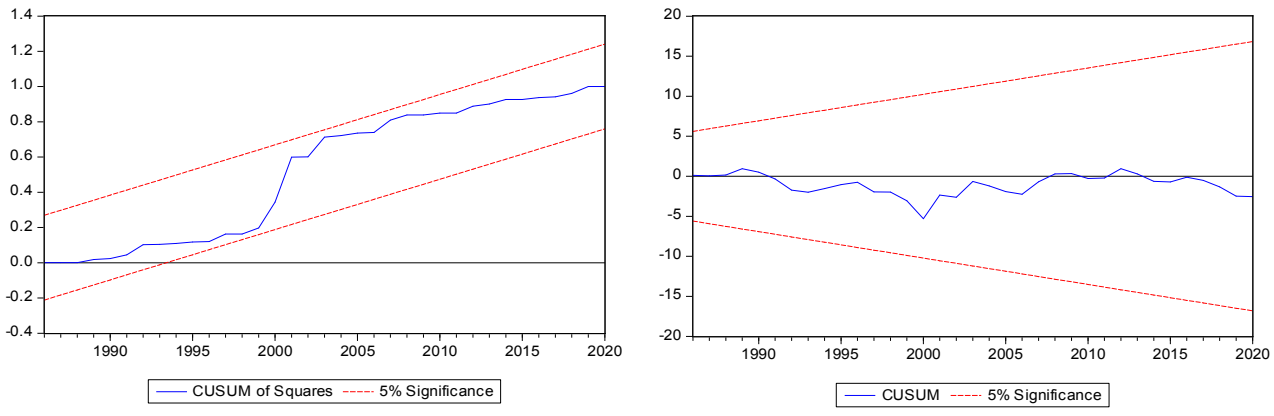
statistical test	valuecalculated	valueprobability	Decision
Serial Correlation(LM test)	2.439326	0.1028	Acceptance of the H_0 hypothesis: no autocorrelation problem
Heteroskedasticity (Breusch-Pagan-Godfrey)	0.139161	0.7109	Acceptance of the H_0 hypothesis: there is no difference of variance problem
Normality (Jarque-Bera)	25.21473	0.000003	Rejection of the H_0 hypothesis: the residuals are not normally distributed
Ramsey RESET Test	3.820566	0.0589	Acceptance of the H_0 hypothesis: The model does not suffer from the problem of indeterminacy

Source: prepared by the researcher based on the outputs of the Eviews 9 program

Through the above table, and according to the (LM) test, the value of the critical probability was 0.1028, which is greater than 0.05. Therefore, we accept the null hypothesis H_0, which states that there is no self-existence among the residuals. The model does not suffer from the problem of autocorrelation, as indicated by the results of the (Breusch-Pagan) test. -Godfrey) indicated that the probability value amounted to 0.7109, which is greater than 0.05, and therefore we accept the null hypothesis H_0, meaning that the model does not suffer from the existence of a problem of variance, as for the normal distribution test, and according to the (Jarque-Bera) test, the null hypothesis H_0 was rejected, which means The series of residuals are not distributed normally, as indicated by the (Ramsey RESET) test, which indicates the validity of the linear function form used in the model according to the probability 0.0589 greater than 0.05, that is, accepting the null hypothesis H_0, which states that the model does not suffer from the problem of indeterminacy.

To test the structural stability of the estimated model parameters, the cumulative sum of residuals test and the cumulative sum of squares test of the residuals were used, and it is clear from the figure below that the model is located within the critical limits in both tests at a significant level of 5%, thus accepting the null hypothesis and judging the structural stability of the model.

Figure 02: Results of the structural stability test of the model according to (CUSUM) test and (CUSUM OF SQUARES) test



Source: prepared by the researcher based on the outputs of the Eviews 9 program

3.3. 4. Estimating the error correction formula for the model (ARDL-ECM):

From Appendix 02, we find that the error correction limit has a negative value, reaching -0.996484, which confirms the existence of a long-term equilibrium relationship between the variables of the study, and the value of the error correction limit parameter shows that about 91% of the short-term imbalance in the inflation rate in the previous period can be corrected in The current period towards the long-term relationship upon the occurrence of any shock or change in the explanatory variables, as evidenced by the results of estimating the short-term relationship that inflation in the short term is positively affected at a significant level of 5% by an increase in the inflation rate in the previous period and an increase in both the exchange rate and output gross domestic product and imports.

3.3. 5. Estimating the Cointegration Relationship in the Long Run:

The previous results confirmed the existence of co-integration between the variables of the study, and Appendix 02 shows the results of estimating the long-term equilibrium relationship of the model ARDL(4, 4, 0, 0), and the estimation results shown in the aforementioned appendix show that there is no relationship between each of the output GDP, imports and inflation in the long run at a significant level of 5%, meaning that both GDP and imports do not exert any effect on inflation in Algeria, while there is a negative inverse relationship at a significant level of 5% between the exchange rate and inflation, meaning that every price increase The exchange rate of 1% leads to a decrease in inflation by 0.42%.

4. Results and discussion:

This is done by estimating both the long-term model and the short-term relationship (error correction model):

4.1. Analyzing Results Through Long-Run Model Estimation:

After confirming the existence of a long-term relationship between the dependent variable, inflation rates, and the independent variables:

-Statistically, we note:

- The statistical significance of the exchange rate variable parameter at the 5% level, i.e. the existence of a long-term equilibrium relationship between the exchange rate and inflation rates on the one hand.
- The absence of statistical significance for the parameters of GDP and imports at the level of 5%, that is, the absence of a long-term equilibrium relationship between GDP, imports and inflation rates. On the other hand.

- Economically note:

- The sign of the two parameters of GDP and the volume of positive imports, which do not fit with the economic theory, in that they constitute the aggregate supply side of the model, and the value of the two parameters was

estimated at 0.09 and 0.23, respectively, which means that any increase in GDP by 1% with Keeping the other factors constant will lead to an increase in the inflation rate by 0.09%. As for the volume of imports, any increase of 1% will lead to an increase in the inflation rate by 0.23%.

- The sign of the negative exchange rate parameter, which is consistent with the economic theory, was estimated at -0.42, as the increase in costs and consumer prices resulting from the devaluation of the Algerian dinar against the currencies of commercial companies leads to an increase in the rate of inflation, meaning that any decrease in the exchange rate of the dinar 1% will lead to an increase in the inflation rate by 0.42%.

4. 2. Analyzing the results by estimating the short-term relationship (error correction model):

The error correction model reflects for us the relationship in the short term or the short term fluctuation about the direction of the relationship in the long term.

Through the results of the estimate, we notice that some coefficients are not significant, but this does not mean that the model is invalid. This is due to the inaccuracy of the statistics and other reasons related to the standard method used, so that the presence of non-significant coefficients does not affect the model as a whole, and through Student results we find The error correction limit coefficient came with a negative and significant sign at the level of significance of 5%, as the value calculated for the Student test in absolute value equal to (-5.09) is greater than the tabular value (1.96), and this confirms that there is a long-term relationship between each of the inflation rates. And for the independent variables.

Through the results of the estimation, we also find that the value of the error correction limit amounted to (-0.9964), which indicates the speed of adjustment from the short term to the long term, meaning that the behavior of inflation rates may take about 1.0036 years (1/0.9964) when any shock occurs to reach To the equilibrium situation in the long term, and it reflects a high adjustment rate, as for the correction rate, every year the equivalent of (99.64) of the imbalances of inflation rates are corrected in the long term.

5. Conclusion:

This study attempted to identify the variables explaining the behavior of inflation in the Algerian economy during the period (1970-2022) and to reach this goal we tried to address the research through two aspects, where we dealt in the first aspect with presenting the concept and types of inflation, and the most important theories explaining inflation, while we devoted the second aspect to the standard study The function of the determinants of inflation in the Algerian economy, using the ARDL autoregressive lagging time gaps model.

After this proposition and analysis, we concluded that the phenomenon of inflation in Algeria is explained in terms of gross domestic product, imports and the exchange rate, which are the main determinants of inflation in Algeria during the period under study. Where we found a direct relationship between the gross domestic product, imports and the inflation rate, and an inverse relationship between the exchange rate and the inflation

rate, that is, with the increase in the level of gross domestic product, the imports inflation rates rise, and this result is not consistent with economic logic, and the lower the exchange rate, the higher the inflation rate, which is What is consistent with the economic logic, and the results of the Bounds Test showed that there is a long-term equilibrium relationship between inflation and its determinants, and an estimate was made for the restricted error correction model, and we concluded that every year the equivalent of (99.64%) of the long-term inflation imbalances are corrected, The results also showed that the exchange rate is the most important determinant of inflation in the long and short terms.

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7. Appendices:

Appendix 01: ARDL model estimation results

ARDL Cointegrating And Long Run Form
Dependent Variable: INF
Selected Model: ARDL(4, 4, 0, 0)
Date: 07/15/23 Time: 19:50
Sample: 1970 2022
Included observations: 47

Cointegrating Form

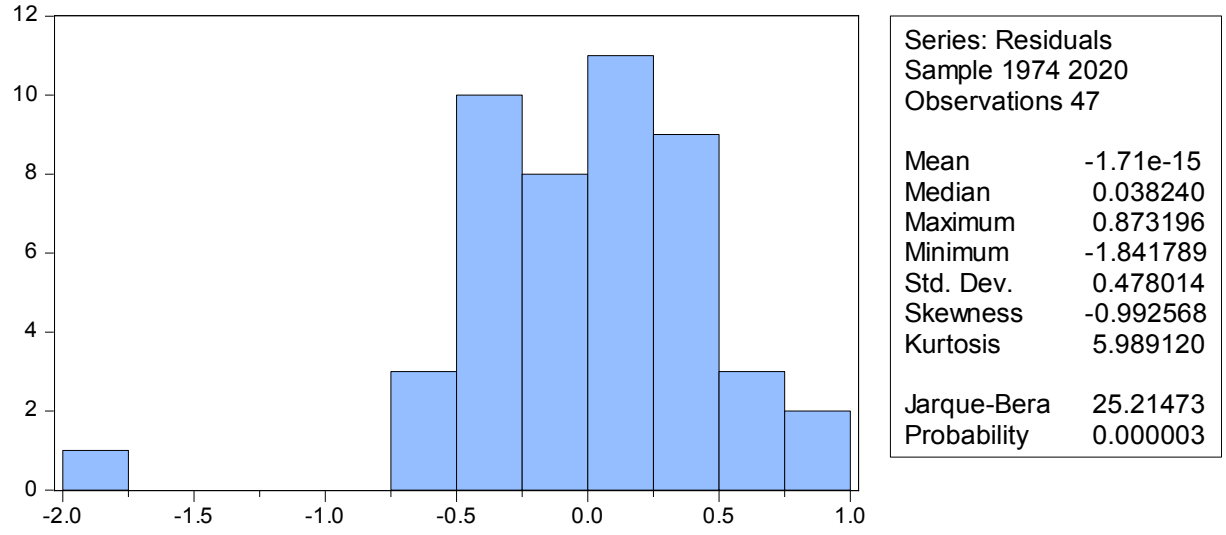
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INF)	0.161505	0.165146	0.977953	0.3348
D(INF)	0.305362	0.151538	2.015092	0.0516
D(INF)	0.323266	0.132297	2.443482	0.0197
D(TCH)	1.327497	0.854454	1.553620	0.1293
D(TCH(-1))	0.304605	1.094524	0.278300	0.7824
D(TCH(-2))	0.456649	1.129166	0.404413	0.6884
D(TCH(-3))	1.228811	0.864532	1.421361	0.1641
D(PIB)	0.091681	0.047949	1.912059	0.0641
D(IM)	0.234447	0.272801	0.859405	0.3960
CointEq(-1)	-0.996484	0.195769	-5.090091	0.0000

Cointeq = INF - (-0.4285*TCH + 0.0920*PIB + 0.2353*IM -6.6555)

Long Run Coefficients

Variable	Coefficient	Std. Error	t-Statistic	Prob.
TCH	-0.428494	0.116590	-3.675221	0.0008
PIB	0.092004	0.047574	1.933932	0.0612
IM	0.235274	0.276955	0.849502	0.4014
C	-6.655460	8.700709	-0.764933	0.4494

Appendix 02: Diagnostic Tests



Breusch-Godfrey Serial Correlation LM Test:

F-statistic	2.439326	Prob. F(2,33)	0.1028
Obs*R-squared	6.053453	Prob. Chi-Square(2)	0.0485

Heteroskedasticity Test: ARCH

F-statistic	0.139161	Prob. F(1,44)	0.7109
Obs*R-squared	0.145028	Prob. Chi-Square(1)	0.7033

Ramsey RESET Test
Equation: UNTITLED
Specification: INF INF(-1) INF(-2) INF(-3) INF(-4) TCH TCH(-1) TCH(-2) TCH(-3) TCH(-4) PIB IM C
Omitted Variables: Squares of fitted values

	Value	df
t-statistic	1.954627	34
F-statistic	3.820566	(1, 34)

F-test summary:

	Sum of Sq.	df
Test SSR	1.061790	1
Restricted SSR	10.51088	35
Unrestricted SSR	9.449088	34