

Understanding inflation in Algeria between 2000 and 2021

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Abstract

Our study examines the causes of inflation in Algeria from 2000 to 2021. We focus on key variables commonly cited in economic literature, including monetary aggregates such as M2, equipment and operating expenditures, exchange rates, and imports. Using an ARDL model with annual data, we analyze short and long-term coefficients. Our results show that in the short term, operating expenditure, M2, and imports are positively correlated with inflation, while equipment expenditures exhibit a negative correlation with a one-period delay. In the long term, however, monetary aggregates and imports emerge as the primary drivers of inflationary pressures in Algeria.

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1. Introduction

Inflation remains an enigma whose comprehension transcends the simple figures on which it relies. Attempting to grasp its nature entails exploring a complex body of economic theories and empirical realities, a task made even more delicate with the emergence of new nuances in contemporary economic discourse.

The intellectual legacy of Keynes and Friedman undeniably laid the foundations for understanding inflation. Keynes' ideas (1936) brought a crucial macroeconomic perspective, emphasizing the role of government policies in managing the economy and prices, while Friedman (1968) advocated a monetarist approach, focusing on the money supply and its impact on prices. In this vein, the Quantity Theory of Money highlights the relationship between the money supply and the general price level. According to monetarists and neo-monetarists, notably Friedman (1968, p.9), "inflation is always and everywhere a monetary phenomenon." Any increase in the price level, regardless of its origin, necessarily implies an increase in the circulating money supply according to the formula; $\Delta p/p = \Delta m/m - \Delta y/y$. Other authors hold a completely different view, such as Fischer (1990, p.138-139), who argues that, "Budgetary pressures notably fuel inflationary pressures by monetizing significant deficits, and high inflation is almost always and everywhere a budgetary phenomenon." This denotes a certain complexity in explanations related to the phenomenon of inflation, which is the focus of this study.

Our exploration in Algeria transforms into a complex questioning, navigating through different explanatory models. The potential causes of inflation, whether stemming from excessive demand in an Algerian economy influenced by specific public policies and consumption habits, high production costs especially in sectors dependent on external factors, monetary pressures within an Algerian economy with distinct monetary nuances, or budgetary imbalances, a potential source of inflation according to the theory of budgetary inflation, adapt to the Algerian reality where budgetary fluctuations, often linked to oil revenues, can shape economic developments.

Algeria has experienced various fluctuations in the general price level during the period 2000-2021. The inflation rate ranges from 0.3% in 2000 to 4.19% in 2001, then reaches a peak of 8.89% in 2012 following the subprime crisis and the ripple effects affecting Algerian exports and international commodity prices. Despite the oil shock of 2014, inflation remains relatively stable, fluctuating between 2.91% in 2014 and 6.40% in 2016. After the unconventional financing in October 2017, liquidity repurchase operations, and effective management of compulsory reserves, stabilized inflation rates in a scenario where all macroeconomic indicators promised record inflation rates. Indeed, in 2019, the inflation

rate dropped to 2.41%, then to 1.95% in 2020. However, due to the Covid-19 pandemic, inflation reached 7.23% in 2021, representing a very high rate compared to previous years. The fluctuations are due to various causes, each rooted in distinct theoretical references, contributing to shaping the understanding of inflation in the Algerian context. Therefore, our research objective revolves around the question: What are the main factors affecting inflation in Algeria? In an attempt to answer this question, our contribution will highlight some causes of inflation, particularly those most cited in economic literature. This is significant as it will help identify the most relevant variables to test for the case of Algeria. The second point will focus on the evolution of the inflation level during the period from 2000 to 2021 based on reports from the Bank of Algeria. Finally, using the ARDL model and analyzing short and long-term coefficients, we will test the validity of these variables in their implications for fueling inflationary pressures.

2. Theoretical debate on the causes of inflation

Inflation, a complex economic phenomenon, arises from a multitude of forces and dynamics that impact the evolution of prices in an economy. Understanding the underlying causes of inflation is crucial for formulating effective economic policies and predicting economic fluctuations. This exploration of the causes of inflation will lead us through various aspects, ranging from the dynamics of demand to the intricacies of production costs, encompassing the complexities of imported inflation.

2.1 Monetary inflation

The connection between money and inflation is intricate. The transmission process is highly varied, partly due to the strong dependence on adjustments to the economic and institutional context, as emphasized by El-shagi and Giesen (2013). The debate on the role of monetary pressures in triggering inflation dates back to the foundations of monetary and macroeconomic theory. Several theoretical perspectives have been proposed to understand how the money supply and monetary policies can influence the general price level. In this context, the Quantity Theory of Money, associated with Fisher (1911), establishes a direct relationship between the money supply, the velocity of money circulation, and the price level. The quantity equation of money ($MV = PQ$), where M represents the money supply, V the velocity of circulation, P the price level, and Q the real output, suggests that increases in the money supply can lead to inflation if production does not keep pace. Friedman (1969) popularized the monetarist view, emphasizing that inflation is essentially a monetary phenomenon. He nuanced this perspective by highlighting that excessive demand is only a temporary cause of inflation, but sustained monetary expansion is often the driving force behind excessive demand growth, ultimately leading to continuous inflation. According to

Friedman, excessive growth of the money supply beyond real output growth inevitably leads to price increases, emphasizing the equality between the money supply, nominal income (PY), and real national output (Q). In recent literature, numerous studies highlight a positive relationship between the money supply and inflation, such as those by Catão and Terrones (2005) and Lin et Chu (2012), suggesting that an increase in the money supply can lead to both inflation and price instability. In a study conducted by Bawono (2019) aiming to identify factors influencing inflation over the period from 1987 to 2017, the results of his multiple linear regression indicate that the money supply has a positive and significant impact on inflation.

2.2 Budgetary Inflation

To finance budget deficits or simply increase expenditures without resorting to private borrowing or tax hikes, the State, not willing to opt for either, has another alternative. It can issue bonds directly purchased by the central bank. This provides the government with new monetary availability in the form of cash, scriptural, or electronic money. This option is known as the monetization of deficits or debt. This operation would involve an increase in the central bank's monetary base. When carried out on a large scale and over the long term, it systematically leads to an increase in the circulating money supply and represents a strong inflationary bias. There is no miracle solution on the part of the central bank to keep price levels stable under significant and repetitive budgetary pressures.

In other words, in the game of dominance or cooperation between the two authorities, "budgetary and monetary," if the first authority adopts an active behavior according to Leeper (1991), the Bank of Algeria has no choice but to submit and finance budget deficits. Thus, we enter Leeper's (1991) third game. Since, if the central bank refuses this subordination and clings to inflation targeting, the situation becomes explosive and risks dragging public finances into a debt spiral. This is what Woodford (1995, 2001); Creel, Jérôme, and Sterdyniak (2001); Burnside (2004) have highlighted in their work on budgetary implications in price determination. Under this framework, the conveyed idea is that the State must ensure the balance of its budgetary policy and finances to alleviate pressure on the Bank of Algeria and assign it only the stability of prices as its main objective. To do this, the State must generate positive shocks on its future budget surpluses that should be endogenous and sufficient to ensure compliance with its intertemporal budget constraint and equalize its assets and liabilities, regardless of the price path.

2.3. Demand and the Rational Expectations Approach to Inflation

The question of whether excessive demand is an underlying cause of inflation has sparked debates within the economic community. Advocates of this theory, including John Maynard Keynes, have emphasized the significant role of aggregate demand in inflation dynamics. Keynes (1936) proposed the idea that inflation can be triggered by a rapid and substantial increase in overall demand compared to the available supply in the economy. When consumer, business, and government demand significantly rise, it can exceed the economy's production capacity, leading to a widespread increase in prices. Keynes highlighted the concept of an "overheated" economy, where excess demand creates inflationary pressures.

The debate on the relationship between excessive demand and inflation has evolved over time with contributions from contemporary authors. Tinbergen (1952) developed the "Tinbergen rule," emphasizing that monetary and fiscal policies can be coordinated to achieve multiple objectives, such as price stability and full employment. This integrated approach provides a framework for managing demand without compromising price stability. However, Krugman (1998) brought a neo-Keynesian perspective by emphasizing that in certain circumstances, especially during periods of underutilized resources, an increase in demand can stimulate production without necessarily causing inflation. These theoretical contributions were revisited, notably by Blanchard (2008), who introduced the concept of an "augmented Phillips curve," which takes into account the expectations of economic agents. According to this approach, the relationship between unemployment and inflation depends not only on demand but also on inflation expectations. An increase in demand can temporarily raise inflation, but if agents anticipate this increase, wage and price adjustments may be faster, thereby moderating the impact on long-term inflation. Thus, this suggests that demand alone cannot be a determining factor but must be linked to the phenomenon of household and business expectations. The works of Lucas (1972) and Sargent (1973) introduced the theory of rational expectations, highlighting the crucial role of economic agents' expectations in the inflationary process. Changes in the money supply can influence expectations and, consequently, price and wage-setting behaviors.

2.4. Production Costs and Inflation

The debate on the role of production costs in inflation has been at the heart of economic discussions for many decades. Economists have proposed different perspectives to understand how variations in production costs can influence the general price level. Joan Robinson (1933) contributed to the cost-price theory, suggesting that variations in production costs, such as wages and raw materials, can influence prices. According to this perspective, an increase in production costs can lead to a price hike to maintain business

profit margins. In this context, the new Keynesian economy offers a more nuanced view by integrating frictions in markets. According to this perspective, monetary policies can influence short-term inflation by changing economic agents' expectations and acting on nominal production costs. (Lucas, Blanchard, Mankiw, Krugman, Ben Bernanke, ...). This suggests an interaction between economic policies in relation to the complexity of this phenomenon. Phillips (1958) and Samuelson and Solow (1960) suggest an inverse relationship between unemployment and inflation, often modified by production costs. Cost variations, especially wages, can shift the Phillips curve, leading to higher inflation even in the presence of unemployment. This highlights the significant role of costs in the formation of macroeconomic aggregates directly or indirectly affecting the general price level. Friedman (1970) and Phelps (1967) developed the cost-push inflation theory, stating that inflation results from persistently maintaining unemployment below the natural rate. A decrease in unemployment stimulates demand, but as production approaches maximum capacity, production costs increase, leading to an inflationary spiral. Krugman (1995), in his work "Development, Geography, and Economic Theory," emphasizes the importance of transportation costs in determining regional economic structures. Variations in transportation costs, influenced by factors such as fuel prices, logistics, and disruptions in the sector, can have direct implications on the prices of goods and services, thus influencing inflation. Laffargue's findings (2004) moderate the importance of costs in inflation formation by highlighting that this impact may also depend on a country's industrial structure. In economies heavily reliant on transportation, significant variations in transportation costs can have more significant consequences on prices.

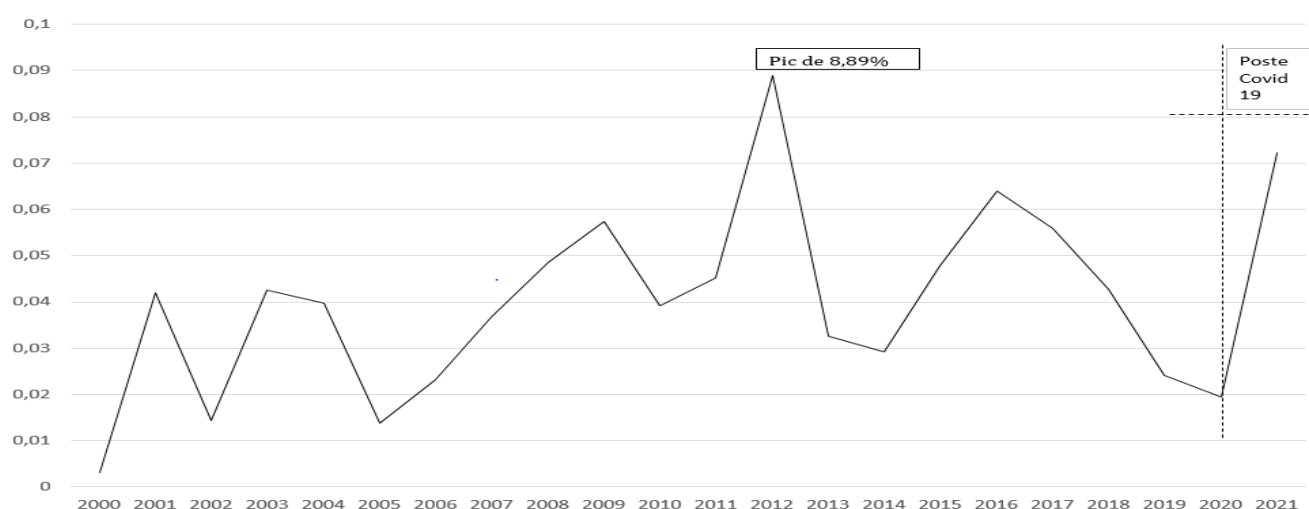
2.5. Imported inflation and currency value

Imported inflation refers to the increase in the prices of goods and services imported into an economy, thereby contributing to a general rise in prices. This can result from various factors. The question of whether currency depreciation can be considered an underlying cause of imported inflation sparks debate within the economic community. Advocates of this theory, including renowned economists such as Paul Krugman and Obstfeld, highlight the crucial role of exchange rate fluctuations in triggering inflationary pressures. Krugman (2007) emphasizes that the depreciation of a currency can lead to an increase in the prices of imported goods and services. In a world of interconnected markets, significant depreciation can raise import costs, thus transmitting inflationary pressures to the national economy. The works of Obstfeld and Rogoff (2000) support this perspective by pointing out that exchange rate variations can influence inflation through import channels. Depreciation of the national currency can result in higher prices for imported goods, directly impacting production costs and, ultimately, consumer prices.

However, some monetarist economists nuance this relationship, as seen in Friedman's (1988) suggestion that currency depreciation may be a temporary phenomenon, emphasizing that the persistence of inflation depends more on monetary factors than on occasional exchange rate fluctuations. Frankel and Rose (1995) sought to quantify the impact of currency depreciation on inflation, taking various factors into account. Their results suggest that the relationship between exchange rates and inflation can be complex and dependent on specific economic contexts. Frankel (2011) argues that variations in commodity prices, such as oil, metals, and agricultural products sold in international markets, can exert pressure on production costs. An increase in commodity prices can lead to rising input and production costs, especially in resource-intensive sectors. These increased costs can be passed on to the prices of final goods and services, contributing to domestic inflation. Bernanke et al. (1997) complement this perspective by emphasizing the role of expectations in transmitting commodity price variations to inflation. Consumer and business expectations regarding the persistence of price increases can influence wage and price adjustments, amplifying the impact of commodity price variations on inflation.

3. Inflation in Algeria: Current Situation

Fig. 1. Evolution of the inflation rate in Algeria between 2000 and 2021.



Source: Authors with data from the Bank of Algeria.

The period between 2000 and 2010 can be referred to as "the period of inflation targeting quantification." Indeed, in the 2003 report published in 2004, the term "inflation targeting" was introduced for the first time by the Bank of Algeria. This period is characterized by a autonomously conducted monetary policy, reflected not only in the promulgated laws but also by the absence of significant pressures in the economic sphere. Moderate inflation rates, ranging from 2.58% in 2003 to 3.91% in 2010 (Bank of Algeria, 2008; 2013), bear

witness to a relatively stable economic environment during this period. According to Achour Tani (2013), this increase is attributed to several factors. Firstly, it is linked to the increase in the guaranteed national minimum wage (SNMG), which rose from 6,000 to 8,000 dinars. Additionally, the recapitalization of banks generated an over-liquidity in the economy, contributing to this rise. Furthermore, the psychological impact of the launch of the Economic Revival Support Plan (PSRE) in April 2001 could also be an additional explanatory factor.

After 2010, concerning inflation performance, this period is marked by the adoption of Ordinance 10-04 of August 26, 2010, aiming to modify and complete Ordinance No. 03-11 of August 26, 2003, regarding currency and credit. Article 35 of this ordinance assigns to the Bank of Algeria the primary responsibility of maintaining price stability as the central objective of its monetary policy. Despite this, inflation recorded its highest rate in 2016, which is 6.40%. The average annual inflation accelerated for twelve consecutive months until March 2017, reaching 7.07%, slowed down afterward to 5.59% in December 2017, and 4.33% in April 2018, despite the unconventional financing adopted by Law 17-10 of October 24, 2017. The Bank of Algeria increased the reserve requirement rate from 4% to 8% on January 15, 2018, then from 8% to 10% in June 2018. The total amount "sterilized" under this instrument is 659 billion dinars, leading to a decrease in inflation to 2.44% in 2019. In 2021, the Consumer Price Index continued to rise significantly, displaying the highest inflation rates of the decade. The average annual growth rate of the national index reached 6.62%, while that of Greater Algiers recorded an inflation of 7.23%.

4. The Model

4.1 Variable Selection and Expected Signs

- Inf: The variable "inflation" is the dependent variable in the model. It is calculated based on the Consumer Price Index (CPI) base 2001. The data is extracted from reports by the Bank of Algeria.
- Dq: The variable "capital expenditures" is the first explanatory variable. Its time series is derived from reports by the General Treasury Directorate (DGT). The expected sign is negative as this variable is expected to have a negative correlation with inflation based on the literature.
- Df: The variable "operating expenses" is the second explanatory variable. Its time series is derived from reports by the General Treasury Directorate (DGT). The expected sign is positive as an increase in these expenses would imply an increase in inflation.

- Tx: The variable "exchange rate" is the third explanatory variable. The data is extracted from reports by the Bank of Algeria. The expected sign is positive as an increase in the exchange rate would imply an increase in inflation.
- M2: The variable "money supply, M2 definition" is the fourth explanatory variable. The data is extracted from reports by the Bank of Algeria. The expected sign is positive as an increase in money supply would imply an increase in inflation.
- M: The variable "imports" is the fifth explanatory variable. The data is extracted from reports by the National Institute of Statistics (ONS). The expected sign is positive as an increase in imports would imply an increase in inflation, particularly imported inflation.

4.2 Model Selection

The functional form of the model can be expressed as follows:

$$Inf_t = \alpha + \beta_0 (M2_t) + \beta_1 (M_t) + \beta_2 (Tx_t) + \beta_3 (Dq) + \beta_4 (Df_t) + \xi_t \dots \dots \dots (1)$$

Coupled with the properties of the ARDL model, the final function can be written as follows:

$$\Delta inf_t = \alpha_0 + \sum_{i=0}^q a_{1i} inf_{t-i} + \sum_{i=0}^q a_{2i} \Delta m2_{t-i} + \sum_{i=0}^q a_{3i} \Delta m_{t-i} + \sum_{i=0}^q a_{4i} \Delta tx_{t-i} + \sum_{i=0}^q a_{5i} \Delta dq_{t-i} + \sum_{i=0}^q a_{6i} \Delta df_{t-i} + \varphi_1 m2_{t-1} + \varphi_2 m_{t-1} + \varphi_3 tx_{t-1} + \varphi_4 dq_{t-1} + \varphi_5 df_{t-1} + \mu_t \dots \dots \dots (2)$$

With:

- Δ : First difference operator
- α_0 , constants
- $a_{1t}, a_{2t}, a_{3t}, a_{4t}, a_{5t}$: Short-term parameters
- $\varphi_1, \varphi_2 + \varphi_3 + \varphi_4 + \varphi_5$: Long-term dynamics of the model
- μ_t : Error terms (white noise)

4.3. Stationarity Testing of Variables

We initiate the econometric tests by analyzing the stationarity of the model series. Tests on Model 1, then 2, and subsequently 3 indicate that the series are not stationary at the level, prompting us to difference them. With a single filter, the series proved to be stationary in the

first difference. Knowing the two necessary conditions: the dependent variable must be stationary in the first difference, and the rest of the variables must be either stationary at the level or in the first difference, the ARDL model can be employed. The results of the Augmented Dickey-Fuller (ADF) stationarity tests are summarized in the table below:

Table 1. Stationarity Test Results

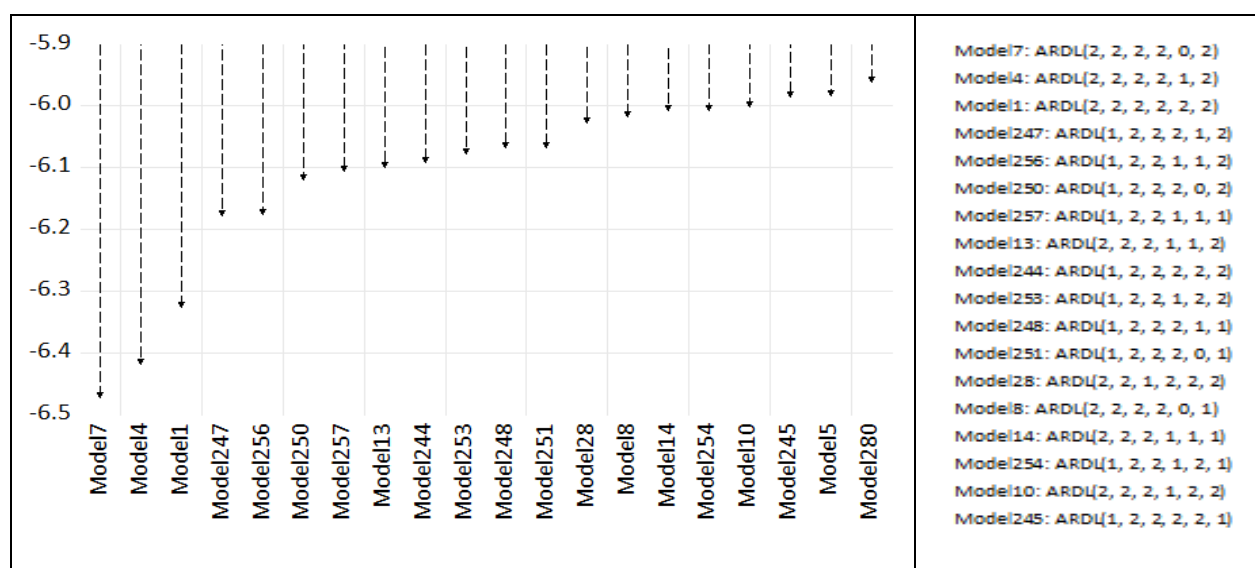
Variables	Model 3		Model 2		Model 1		1st Difference		
	T-trend	tc	T-cons	tc	ADF	Tc	ADF	Tc	
Inf	1,62	2,79	2,05	2,54	-0,09	-1,96	-4,82	-1,96	I(1)
Dq	0,36	2,79	1,92	2,54	0,17	-1,95	-4,46	-1,95	I(1)
Df	1,81	2,79	1,57	2,54	2,1	-1,95	-3,05	-1,95	I(1)
Tx	2,15	2,79	-1,05	2,54	2,65	-1,95	-2,62	-1,95	I(1)
m2	2,76	2,79	2,48	2,54	5,85	-1,95	-2,12	-1,96	I(1)
M	1,29	2,79	2,09	2,54	-1,16	-1,96	-2,03	-1,96	I(1)

Sources: Results obtained with Eviews 12.

The results of the stationarity tests on the variables reveal that all variables are stationary in the first difference, allowing for the use of the ARDL model.

As seen in Figure 2 below, the ARDL model (2.2.2.2.0.2) is the most optimal among the 19 others presented, as it provides the smallest AIC value.

Fig. 2. Akaike Information Criterion



Sources: Results obtained with Eviews 12.

4.4 Bounds Cointegration Test

Following the automated procedure in Eviews 12, the Pesaran et al. (2001) cointegration test requires the prior estimation of the ARDL model. The calculated test statistic, namely the Fisher's F value, will be compared to critical values (forming bounds). The cointegration results of the ARDL model (2.2.2.2.0.2) are illustrated in the following table:

Table 2. Pesaran et al. (2001) Cointegration

Test statistic	Value	Critical Value	significance	
			I(0)	I(1)
F-statistic	8.583138	10%	2,08	3,00
K	5	5%	2,39	3,38
		2,50%	2,70	3,73
		1%	3,06	4,15

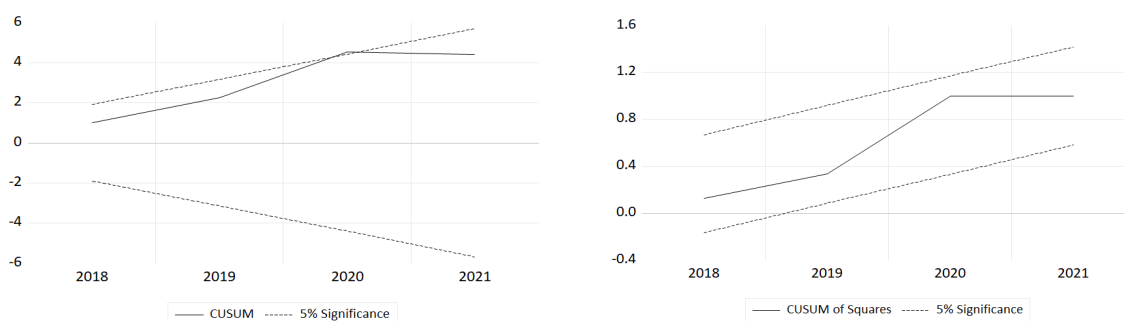
Sources: Results obtained with Eviews 12

This test refers to the critical values defined by Narayan P.K (2005). The results of the bounds test procedure demonstrate that the Fisher statistic ($F = 8.583138$) exceeds the upper limit for various significance thresholds: "1%, 4.15", "2.5%, 3.73", "5%, 3.38", and "10%, 3.00". Consequently, we reject the null hypothesis H_0 , which assumes the absence of a long-term relationship, and we conclude the existence of a long-term relationship among the different variables.

4.5 Stability and Model Validation Tests

The CUSUM stability test, based on the dynamics of forecast errors, allows for the detection of structural instabilities in regression equations over time, thereby assessing the model's stability.

Fig. 3. CUSUM and CUSUM OF SQUARES Test



Sources: Results obtained with Eviews 12

The CUSUM test reveals that the trajectory of the sum of residuals remains within the 5% critical bounds, indicating stability in the model coefficients. The presented results (Table 3) indicate that the probability associated with each test significantly exceeds the 5% threshold, leading us to accept the null hypothesis, i.e., the absence of errors autocorrelation and homoscedasticity. The critical probability associated with the Ramsey Specification test is 0.6742, surpassing the 5% critical threshold, affirming that the model is correctly specified.

Table 3. Diagnostic Test Results for the Model

Tests statistics	Tests	P-value
Autocorrelation	Breusch-Godfrey	0,4896 > 0,05
Heteroskedasticity	Breusch-Pagan-Godfrey	1.0000 > 0,05
Residual Normality	Jarque-Bera	0.6174 > 0,05
Functional Form Test	Ramsey	0.6742 > 0,05

Sources: Results obtained with Eviews 12

All validation tests confirm a good specification of our estimated ARDL (2.2.2.2.0.2) model. Its overall significance, as indicated by the R-squared value of 99.0054%, is very high. This implies that the selected variables explain 99.0054% of the dynamics of inflation in Algeria from 2000 to 2021.

4.6 Long-Term Coefficients and Short-Term Dynamics

4.6.1 Short-Term Coefficients (ST)

Table 4. Short-Term Coefficient Estimation Results

Variable	Coefficient	t-Statistic	Prob.
C	0.020843	0.253167	0.8126
INF(-1)	-3.344596	-3.434671	0.0264
DQ(-1)	3.04E-05	0.555887	0.6079
DF(-1)	2.05E-05	-3.920230	0.0095
M(-1)	2.30E-05	0.532437	0.6226
M2	1.56E-05	-2.661501	0.0563
TX(-1)	0.000701	0.727327	0.5073
D(INF(-1))	0.801728	1.515734	0.2042
D(DQ)	-3.90E-05	-0.982966	0.3813
D(DQ(-1))	-8.07E-05	-3.405480	0.0271
D(DF)	-4.28E-07	-0.027740	0.9792
D(DF(-1))	2.83E-05	1.877049	0.1337
D(M)	5.06E-05	2.610843	0.0594
D(M(-1))	5.09E-05	2.192916	0.0934
D(TX)	-0.001554	-1.383769	0.2386
D(TX(-1))	-0.001686	-1.725932	0.1594

Source: Calculations by the authors using Eviews 12

In a regression analysis, a variable is typically considered significant if the probability value (Prob.) associated with its coefficient is below a certain threshold, often 0.05 (5%). Significance can also be extended to the 10% (0.1) threshold. The short-term coefficients table suggests, based on these criteria, that the significant variables in our model are: operating expenses, money supply (M2), capital expenditure, and imports, as the probability associated with their respective coefficients is $(0.0095 < 0.05)$, $(0.0563 < 0.10)$, $(0.0271 < 0.05)$, and $(0.0095 < 0.05)$. The second point to consider in our analysis and discussion is the sign of the coefficients, as this demonstrates the direction of correlation between the explanatory variables and the explained variable, which is inflation in Algeria. The coefficients for the variables Df, M2, and M are all positive, indicating a positive correlation with inflation. As for the variable Dq, it is negatively correlated with inflation, aligning with the general literature.

4.6.2 Long-Term Coefficients (LT)

Table 5 below provides the estimated long-term coefficients or elasticities.

Table 5. Long-Term Coefficient Estimation Results

Variable	Coefficient	t-Statistic	Prob.
DQ	9.09E-06	0.497582	0.6449
DF	6.12E-06	0.793649	0.4718
M	6.87E-06	0.608867	0.5755
M2	4.66E-06	2.168378	0.0960
TX	0.000210	2.624476	0.0062
C	0.006232	0.269552	0.8008

Source: Calculations by the authors using Eviews 12

The long-term coefficients table suggests that the significant variables in our model are the money supply (M2) at the 10% significance level and the exchange rate at the 5% significance level. The positive signs of their coefficients indicate a positive correlation with inflation.

5. Analysis and Discussion

It is important to note that the impact of equipment expenses on inflation can vary depending on various factors, including monetary policy, overall economic conditions, and country-specific circumstances.

In the short term, operating expenses appear to be positively correlated with the inflation rate. This can be explained by an increase in demand generated by wealth effects from various social transfers as well as wages. These expenditures lead to an increase in demand for certain goods and services. If supply cannot keep up with demand, it can result in price increases, which is a form of inflation. Inflation can also stem from rising production costs. Indeed, operating expenses may include costs such as wages, raw materials, and energy. If these costs increase, companies may be compelled to raise their prices to maintain their margins, leading to inflation. Furthermore, operating expenses may increase the money supply if financed by central bank monetization by expanding its monetary base. From a monetarist perspective, this can also lead to inflation. Regarding the M2 money supply, it is positively and statistically significantly correlated at the 10% threshold. That being said, when the money supply increases, economic agents have a greater amount of money to spend, resulting in a "wealth effect." This can lead to an overall increase in demand in the economy, causing prices of goods and services to rise. Businesses may be able to charge higher prices because consumers have more money to spend. Delayed equipment expenses are negatively correlated with inflation as they are considered wealth creators in response to the circulating money supply. These expenses seem to increase the supply of goods and services, creating a situation of abundance, which reduces market prices.

Finally, imports appear to be inflationary through several mechanisms. Firstly, successive devaluations of the Algerian dinar make imports more expensive. Imported products then become more costly for domestic consumers, leading to an increase in the prices of imported goods and, consequently, imported inflation. As an example, for the year 2021, the annual index of food prices from the United Nations Food and Agriculture Organization recorded a significant increase in international markets, reaching an average value of 125.8 points, representing a 28.16% increase compared to 2020. This is its highest level in ten years (23.55% in 2011) (Bank of Algeria, 2022). Furthermore, the importation of necessary and non-substitutable inputs in the national production process increases production costs, which are reflected in selling prices. Sometimes, the increase in prices of imported goods may push consumers towards similar domestic goods and services. This creates upward pressure on domestic demand, which can also contribute to inflation if companies cannot meet this demand without raising their prices. Finally, imports can generate inflation through the addition of growing costs of international logistics and supply chains.

In the long term, the money supply also appears to be inflationary, for the same reasons mentioned in the short-term analysis. As for the exchange rate, this variable is positively correlated with inflation, likely for the following reasons: Firstly, dinar devaluations increase import prices, which transmit to domestic prices. They can also impact the

production costs of domestic companies that rely on imports of raw materials or components. If these costs increase due to these devaluations, companies may be compelled to raise prices for their products to maintain profit margins, contributing to domestic inflation. Devaluations can also influence the expectations of economic agents regarding future inflation. If they expect the exchange rate to continue its increase, they may adjust their behaviors accordingly, anticipating upcoming price hikes. These expectations can become self-fulfilling and contribute to an inflationary spiral.

6. CONCLUSION

In conclusion, the analysis of various elements reveals significant correlations between certain variables and the inflation rate in Algeria. In the short term, operating expenses show a positive correlation with inflation, suggesting an increase in operational costs that could contribute to rising prices. Similarly, the M2 money supply exhibits a positive correlation with inflation both in the short and long term, indicating that monetary expansion may be a persistent inflationary factor in the economy. However, it is interesting to note that delayed equipment expenses demonstrate a negative correlation with inflation. This phenomenon can be explained by the fact that these investments are often associated with the creation of real wealth, acting as a counterpart to the increase in the circulating money supply, which could temper inflationary pressures. Also, in the long term, the exchange rate can be considered inflationary. This dynamic is explained by the fact that prolonged fluctuations or persistent depreciations of the national currency can lead to a widespread increase in the prices of imported goods, thus contributing to inflation. Furthermore, a devalued currency can also make imports more expensive, which ripples into production costs and ultimately domestic prices, further fueling inflationary pressures. Finally, imports are identified as a potentially inflationary factor, emphasizing the importance of trade policies and mechanisms for controlling the flow of goods in managing inflation.

Overall, these observations highlight the complexity of factors influencing inflation in Algeria, underscoring the need for a holistic and balanced approach in macroeconomic management to mitigate inflationary pressures and promote stable and sustainable economic growth.

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