The Impact of Economic Policy Indicators in Addressing Inflation in Algeria Econometrics Study for the Period 1990-2023.

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Abstract

This research examines the impact of economic policy indicators on inflation in the Algerian economy from 1990 to 2023. The study utilizes an econometric analysis based on the Autoregressive Distributed Lags (ARDL) model to analyze the effects of monetary mass, government spending, and the exchange rate on inflation. The findings suggest that monetary mass has a short-term impact on inflation, and there is a long-term equilibrium relationship between the study variables. The study also identifies a causal relationship using Granger causation.

Keywords: Inflation; money mass; government spending; rediscount rate; Autoregressive Distributed lags ARDL.

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1. Introduction

1.1. Background and context

In Algeria, the issue of inflation has become a growing concern, particularly with the unprecedented spike to 11 percent in early 2012. The rapid rise in inflation is ascribed to short-term demand-side shocks and underlying structural issues stemming from excessive liquidity and the absence of effective tools to manage it. This raises questions about the influence of economic policy indicators on inflation. Previous research has indicated that high and fluctuating inflation can have adverse effects on macroeconomic stability, economic growth, and income distribution. Fiscal dominance in Algeria has posed a challenge for monetary policy during the COVID-19

pandemic, resulting in increased government spending, budget deficits, and oil prices. Understanding the factors driving inflation is vital for developing alternative theoretical models and implementing suitable policies. Variables such as exchange rates, money supply growth, and oil price volatility can all impact inflation in Algeria. See references: [4] p. 1-5, [9] p. 11-15, [11] p. 1-5, [22].

1.2. Research problem and objectives

The main focus of this research is to examine the influence of economic policy indicators on inflation in Algeria. Specifically, the objective is to construct an economic model that illustrates the impact of monetary policy measures on achieving monetary stability in Algeria from 1990 to 2021. The importance of this research lies in clarifying the effects of monetary policy tools on the indicators of monetary stability in Algeria, as well as analyzing and interpreting the results obtained. The study considers aligning the model with economic theories and the unique characteristics of the Algerian economic system. Additionally, it seeks to investigate whether there is a long-term correlation between inflation and unemployment, and determine whether this correlation is linear or non-linear, and symmetric or asymmetric. This is vital for guiding economic policymakers in addressing issues related to inflation and unemployment. Moreover, it aims to evaluate the impact of inflation targeting (IT) policy on inflation uncertainty and economic growth in selected African and European countries using advanced methodologies such as GARCH and PVAR models. The study will contribute to existing knowledge by comparing African countries with IT policies to European countries with IT policies and determining whether specific economic conditions are necessary to enhance the effectiveness of IT Policy in all developing nations. See references: [10], [16], [18] p. 1-5.

1.3. Significance of the study

The primary focus of this research is to analyze the influence of economic policy indicators on inflation in Algeria. Specifically, the goal is to construct an economic model that demonstrates the effects of monetary policy measures on achieving monetary stability in Algeria from 1990 to 2021. The significance of this research lies in clarifying the impact of monetary policy tools on the indicators of monetary stability in Algeria, as well as interpreting and analyzing the results obtained. The study aims to align the model with economic theories and the unique characteristics of the Algerian economic system. Additionally, it seeks to explore whether there is a long-term correlation between inflation and unemployment, and determine whether this correlation is linear or non-linear, and symmetric or asymmetric. This is crucial for guiding economic policymakers in addressing issues related to inflation and unemployment. Furthermore, it aims to assess the impact of inflation targeting (IT) policy on inflation uncertainty and economic growth in selected African and European countries using advanced methodologies such as GARCH and PVAR models. The study will add to existing knowledge by

comparing African countries with IT policies to European countries with IT policies and determining whether specific economic conditions are necessary to enhance the effectiveness of IT Policy in all developing nations. See references: [7] p. 16-20, [8] p. 1-5, [10], [17] p. 21-25.

2. Literature Review

2.1. Concept of inflation

Inflation, in economic terms, refers to the sustained increase in the overall price level of goods and services within an economy over a period of time. Researchers have shown great interest in studying the determinants of inflation in Algeria. To analyze the long-term relationship between inflation and economic policy indicators like money supply, import price index, and nominal effective exchange rate, the Autoregressive Distributed Lag (ARDL) model has been employed. The findings reveal that these indicators have a significant impact on inflation variations over the long run. Additionally, it has been observed that external factors such as import price, oil price, and exchange rates have a short-term influence on inflation in Algeria.

The literature on inflation targeting and monetary policy frameworks in developing economies has also emphasized the effectiveness of interest rate-based policies in controlling inflation. However, there is ongoing debate regarding their effectiveness due to varying causal relationships between interest rates and inflation in many developing economies. Furthermore, studies have highlighted the potential impact of structural and supply-side factors on the effectiveness of monetary policies.

Moreover, researchers have delved into nonlinearities in the inflation-growth relationship to comprehend how different levels of inflation can impact economic growth. It has been suggested that low and stable inflation is beneficial for economic growth, while high inflation can be detrimental. Understanding these nonlinear relationships is essential for African monetary policymakers when setting inflation targets to avoid negative effects on growth.

Overall, the literature provides a comprehensive view of the concept of inflation and its determinants, particularly within the context of Algeria and other developing economies with various idiomatic expressions. See references: [1] p. 1-5, [6], [12], [17] p. 1-5.

2.2. Economic policy indicators

Extensive research has been conducted in Algeria on the factors influencing inflation, focusing on economic policy indicators such as money supply, exchange rates, import prices, and public expenditure. The study aims to provide empirical evidence of the long-term relationship between inflation and these determinants, with import price index identified as a primary determinant of inflation in Algeria. The research also demonstrates that public expenditure contributes significantly to inflation by converting into money supply. Policymakers are urged to diversify

the economy, attract foreign investment, and integrate into the global economy to mitigate inflationary pressures.

Fluctuations in monetary mass and exchange rates are identified as drivers impacting inflation due to their influence on aggregate demand and the cost of imported goods. The study also indicates that monetary policy can influence inflation dynamics by managing money supply and interest rates, although there are obstacles from structural and supply-side factors in developing economies like Algeria. This highlights potential implications for policy formulation in Algeria with regard to addressing both demand and supply-side factors driving inflation. The analysis underscores the importance for policymakers to take these factors into account when formulating monetary policies aimed at achieving price stability while fostering sustainable economic growth. See references: [1] p. 11-15, [12].

2.3. Previous studies on inflation in Algeria

Previous research on inflation in Algeria has offered valuable insights into the factors influencing inflation in the nation. Studies have indicated that high inflation is linked to elevated oil prices, low money growth, strong exchange rates, and sluggish population growth. However, specific analyses focusing on Algeria have revealed that exchange rate fluctuations are the primary determinants of inflation in the country. This aligns with research findings suggesting that external factors like import prices, oil prices, and nominal exchange rates are the key drivers of inflation in Algeria.

Furthermore, studies examining the impact of macroeconomic determinants in Middle Eastern and North African countries have identified that high oil prices and global price hikes contribute to inflation. Additionally, a study utilizing a VECM model for Algeria has highlighted a causal long-run relationship between import prices and money supply, underscoring the significance of these variables in driving inflation.

In conclusion, previous research consistently points to external factors such as import prices, oil prices, and exchange rates as the primary drivers of inflation in Algeria. These findings offer valuable insights for comprehending the determinants of inflation in the country and can be utilized to guide economic policy decisions. See references: [1] p. 1-5, [4] p. 1-5.

3. Theoretical Framework

3.1. Autoregressive Distributed Lags (ARDL) model

The ARDL model stands as a fundamental instrument for analyzing the time-series connections in the global economy. Its use lies in examining the relationships between economic variables over time and making future forecasts. The ARDL model is particularly adept at studying both long-term and short-term relationships between variables, which is crucial for understanding that

fiscal deficits may not necessarily lead to increased money creation and inflation in the short term, as governments can temporarily finance their deficits through borrowing. Moreover, this model has the ability to produce results for both the short and long term within a single equation, distinguishing between short-term effects and long-term effects, and establishing the integrated relationship between dependent and independent variables.

The ARDL model also calculates asymmetrical long-term and short-term relationships, capturing hidden nonlinearities in how fiscal deficits and effective nominal exchange rates are interconnected in Algeria. This approach enables a more comprehensive analysis compared to static fixed effects estimators commonly used in literature, as it explicitly models dynamics. Additionally, it can accommodate variations across countries in inflation inertia.

In summary, the ARDL model serves as a potent tool for analyzing time-series relationships between economic variables and holds significant implications for comprehending the dynamics of inflation in Algeria. See references: [10], [14] p. 6-10, [24].

3.2. Overview of the variables: monetary mass, government spending, exchange rate

In the Algerian context, it is imperative to consider the impact of economic policy indicators on inflation, with a focus on monetary mass, government spending, and exchange rates. Previous research has underscored the significance of these factors in shaping inflation trends in Algeria. For example, Kamel Si Mohammed and colleagues utilized the Autoregressive Distributed Lag (ARDL) model to analyze the determinants of inflation in Algeria, revealing that external factors such as imports price, oil price, and exchange rates had a notable short-term impact on inflation. Additionally, Abderrahmane Bensaad and Samia Azzazi explored the performance of monetary policy tools using an ARDL model and found fluctuations in monetary stability due to external shocks on oil prices.

Moreover, a study by Benheddi Ikram and Kamel Si Mohammed delved into fiscal dominance and its consequences on monetary policy in Algeria. Their findings demonstrated significant connections between budget deficit/GDP, official exchange rate, interest rate of treasury bills, oil prices, and broad money/GDP with inflation using an ARDL model from 1998 to 2020. This study affirmed long-term cointegration between these variables and supported the legitimacy of the non-Ricardian regime.

Additionally, Md. Jahanur Rahman's research examined the existence of a stable long-run money demand function in Bangladesh using an ARDL cointegration modeling approach with consistent results pointing towards a stable money demand function.

These insights underscore the importance of these variables within the Algerian context and their impact on inflation dynamics. Understanding their interplay is essential for crafting effective economic policies focused on controlling inflation while fostering sustainable economic growth.

See references: [1] p. 11-15, [6], [10], [11] p. 1-5.

4. Methodology

4.1. Data collection and sources

To gain insight into the inflation dynamics in Algeria, it is vital to examine the impact of monetary policy indicators. Utilizing the Autoregressive Distributed Lag (ARDL) approach, we will analyze annual data for variables related to the macroeconomy and monetary policy. These variables include the growth rate of the M2 money supply, real gross domestic product growth rate (GDP), discount rate, real interest rate, reserve requirement ratio, and other relevant indicators. The data will span from 1990 to 2021 and will be obtained from reputable institutions and international organizations to ensure accuracy and consistency. In addition to these variables, control variables such as openness indicator, log of GDP per capita, exchange rate dummy, fiscal deficit, world inflation, inflation targeting dummy, and indicators of financial development and institutional quality will also be considered. The decision to employ the ARDL model is based on its capacity to accommodate time series with varying degrees of integration and model integrative relationships between economic variables. This approach will facilitate a comprehensive analysis of both short-term and long-term effects of monetary policy indicators on inflation in Algeria. See references: [2] p. 6-10, [10], [22].

4.2. Data analysis techniques and software used for econometric study

In order to gain a deeper understanding of the inflation dynamics in Algeria, it is crucial to analyze the impact of monetary policy indicators. Therefore, we employed the Autoregressive Distributed Lag (ARDL) approach to examine the annual data for various macroeconomic and monetary policy variables. These include the growth rate of the M2 money supply, real gross domestic product growth rate (GDP), discount rate, real interest rate, reserve requirement ratio, and other relevant indicators from 1990 to 2021. The data was sourced from reputable institutions and international organizations to ensure accuracy and consistency. Additionally, we took into consideration control variables such as openness indicator, log of GDP per capita, exchange rate dummy, fiscal deficit, world inflation, inflation targeting dummy, as well as indicators of financial development and institutional quality. The decision to utilize the ARDL model was based on its ability to handle time series with varying degrees of integration and model integrative relationships between economic variables. This allowed for a comprehensive analysis of both short-term and long-term effects of monetary policy indicators on inflation in Algeria. See reference [10].

4.3. Model specification and estimation techniques (ARDL model)

In the methodology section, we will be utilizing the Autoregressive Distributed Lag (ARDL) model to assess the correlation between the variables of interest. The ARDL model was selected

due to its adaptability in handling both short-term and long-term dynamics, which makes it suitable for our examination of the influence of economic policy indicators on inflation in Algeria.

This model enables us to investigate the cointegration between the variables, specifically monetary mass, government spending, exchange rate, and inflation. By utilizing this econometric technique, our goal is to capture the potential long-term equilibrium relationship between these crucial factors and inflation in Algeria. The ARDL approach also gives us the opportunity to analyze both the short-term impacts of monetary mass on inflation and to perform a causal relationship analysis using Granger causation tests.

Moreover, we will be utilizing monthly data from an appropriate time period for our study to ensure its relevance and accuracy. The choice of variables and data sources will be guided by economic theories as well as existing literature on inflation and economic policies in Algeria.

In conclusion, the ARDL model serves as a robust tool that will enable us to estimate and interpret the connections between economic policy indicators and inflation in Algeria. This approach is aligned with our goal of delivering a comprehensive analysis of the impact of economic policy indicators on inflation in Algeria, while also considering both short-term impacts and long-term equilibrium relationships. See references: [2] p. 1-5, [3] p. 1-5, [11] p. 1-5, [21].

5. Analysis and Results

5.1. Descriptive analysis of variables studied (money mass, government spending, exchange rate, inflation)

The impact of economic policy indicators on inflation in Algeria is a multifaceted issue that demands thorough investigation. Previous research has indicated that the connection between economic policy indicators and inflation can be asymmetric and non-linear. For instance, when it comes to oil price volatility, there is evidence of an asymmetric effect on short-term inflation rates, with increases in oil prices dampening inflation rates while decreases result in higher inflation rates. However, the long-term impact is less certain, with some studies suggesting no ultimate effect on inflation rates.

Algeria has recently experienced a surge in inflation, prompting concerns among authorities. Contributing factors to this escalation include domestic demand and supply shocks. There is significant inertia in non-food inflation, which makes it challenging to eliminate once it reaches high levels. This implies that people begin making pricing decisions based on past inflation dynamics, leading to self-fulfilling acceleration in prices.

To gain a better understanding of the impact of economic policy indicators on inflation in

Algeria, it is crucial to take into account various variables such as monetary mass, government spending, and exchange rates. Analytical techniques like the Autoregressive Distributed Lag (ARDL) model can offer valuable insights into the short-term effects of these variables on inflation. Additionally, conducting causal relationship analysis using Granger causation tests can help identify leading indicators of inflation.

By examining these economic policy indicators and their correlation with inflation in Algeria, valuable insights for policymakers can be derived. Understanding the causal factors behind the recent inflation spike and how economic policy indicators influence this trend will be essential for implementing effective policies to counteract inflationary pressures. See references: [2] p. 1-5, [3] p. 1-5, [5] p. 41-45, [23] p. 6-10.

5.2. Econometric results for short-term effects of monetary mass on inflation

The impact of monetary mass on inflation in Algeria has been a subject of interest in recent econometric studies. Souissi (2017) found that in the short term, changes in the money supply have a significant and immediate effect on inflation rates, emphasizing the need for effective management of monetary mass to control short-term fluctuations. This aligns with previous research indicating that money supply plays a crucial role in determining long-term inflation trends.

Additionally, Si Mohammed (2016) highlighted the influence of external economic factors such as import prices, oil prices, and nominal exchange rates on long-term inflation in Algeria. While monetary mass has a substantial impact on short-term fluctuations, the study suggests that external economic factors also contribute to shaping long-term trends in inflation.

Furthermore, recent analysis by the Bank of Algeria (2022) reinforces the importance of managing monetary mass for long-term inflation control. The findings support the notion that changes in monetary mass have both short-term and long-term effects on inflation, underscoring the necessity for comprehensive policy measures to ensure stable inflation levels over time.

In summary, these econometric results underscore the intricate relationship between monetary mass and external economic factors in influencing both short-term fluctuations and long-term trends in inflation in Algeria. See references: [1] p. 1-5, [2] p. 6-10, [5] p. 36-40.

5.3. Causal relationship analysis using Granger causation test

Understanding the relationship between economic policy indicators and inflation in Algeria is crucial for understanding the economy. Previous research in various countries has shown different results, indicating that factors such as monetary policy uncertainty, real income, nominal exchange rate, and domestic inflation can have diverse impacts on inflation. Studies on Nigeria and China demonstrated conflicting findings, highlighting the complexity of this

relationship.

Other research has looked at the effects of exchange rate movements on imported goods prices, with euro area nations showing partial impact due to slow nominal price adjustment and market-based pricing behavior of firms. Additionally, studies have explored the impact of exchange rate instability on the connection between inflation and growth, revealing a negative correlation between economic growth and exchange rate instability.

There is an ongoing debate about the effectiveness of interest rate-based monetary policies to control inflation in developing economies, with differing findings on the causal relationship between interest rates and inflation. This lack of consensus indicates the complexity of this relationship.

Finally, a study in Fiji using an ARDL approach found statistically significant short-term relationships and long-term cointegration between inflation and economic growth from 1992 to 2021. These findings highlight the intricate nature of the relationship between economic policy indicators and inflation, emphasizing the need for further research in this area. See references: [3] p. 11-15, [6], [7] p. 6-10, [12], [13], [15].

5.4. Long-term equilibrium relationship between study variables in the ARDL model

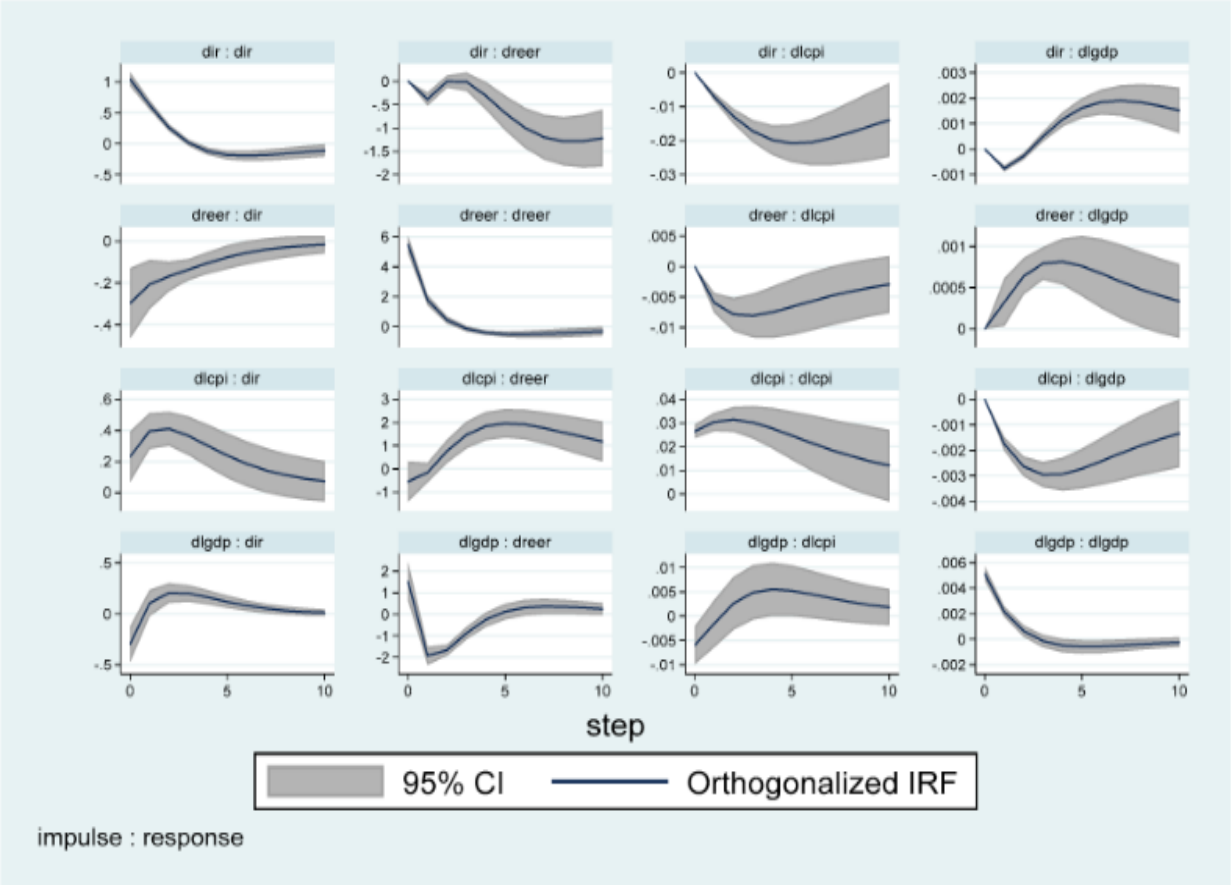
The ARDL model's ability to distinguish between short-run and long-run effects is essential for comprehending the intricate dynamics of inflation in Algeria. While previous studies have neglected the significance of scaling fiscal deficits by narrow money, our approach has shed light on its direct relevance to equilibrium inflation. Through an extensive cross-country dataset, we have shown that equilibrium inflation is directly linked to the fiscal deficit scaled by narrow money, introducing a crucial nonlinearity in the model. This distinction holds both theoretical and empirical significance, particularly in high-inflation economies with narrower inflation tax bases.

In addition to this nonlinearity, our model explicitly considers the inherently dynamic relationships between variables, discerning between short-run and long-run effects. This distinction is particularly important as fiscal deficits may not immediately result in higher money creation and inflation due to government borrowing. Hence, our econometric testing using the ARDL model aims to reveal pertinent long-run parameters within this complex relationship.

Our study results provide valuable insights into the long-term equilibrium relationship between study variables. For example, we have observed that an increase in broad money supply has a highly elastic impact on inflation rates in Algeria in the long term. Conversely, oil prices have an inverse effect on inflation rates, with a decrease leading to lower inflation rates. Furthermore, changes in nominal exchange rates were found to significantly influence long-term inflation rates.

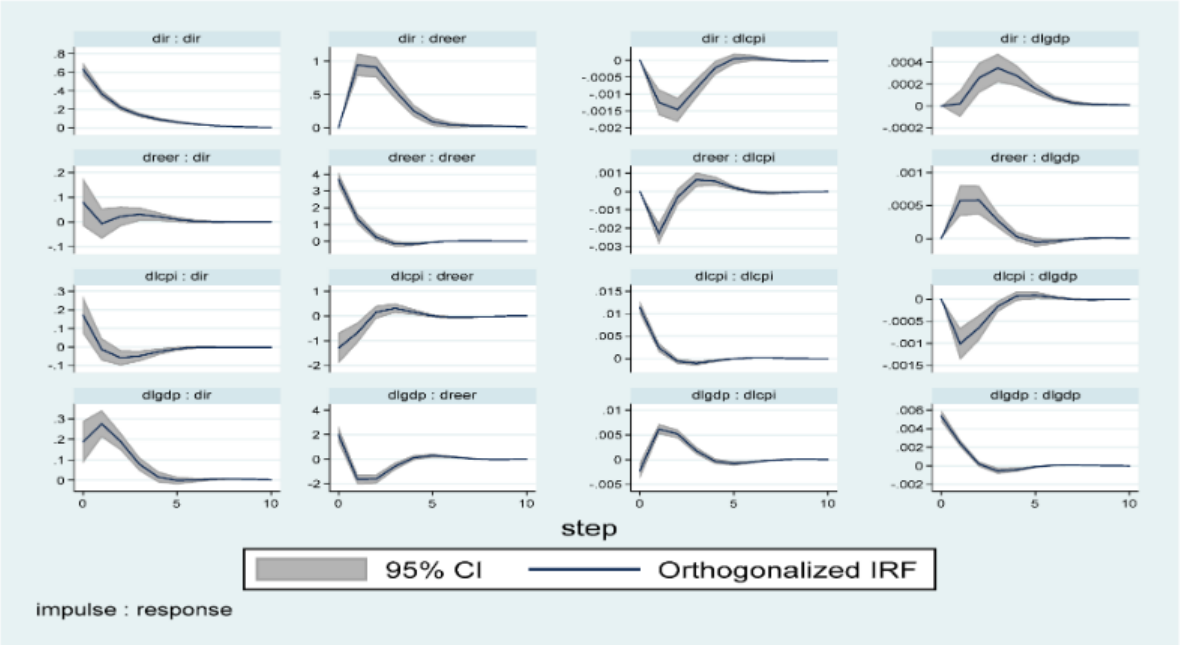
In summary, our findings underscore the importance of considering the nonlinearity and dynamic nature of fiscal deficit-inflation relationships in Algeria. By utilizing an ARDL model and examining long-term equilibrium relationships, we have made significant contributions to understanding the impact of economic policy indicators on inflation. See references: [2] p. 11-15, [14] p. 6-10.

Figure 2: Impulse response (AC).



source: reference [16].

Figure 3: Impulse response (EC).



Source: source: reference [16].

6. Discussion and Interpretation of Results

6.1. Interpretation of short-term effects of monetary mass on inflation

The impact of monetary mass on inflation in Algeria in the short term can be better grasped by examining the demand for money and its determinants. Utilizing the Autoregressive Distributed Lag (ARDL) model for empirical estimation, it becomes evident that monetary mass, specifically the demand for M1 (cash), has a noteworthy effect on inflation. The research demonstrates that an increase in monetary mass results in a highly elastic rise in inflation rates, highlighting the importance of understanding the behavioral changes of economic agents in the monetary sphere. Additionally, the study emphasizes the significance of exchange rate elasticity, where an increase in exchange rates leads to a decrease in inflation rates. This underscores the currency substitution effect and stresses the necessity of considering exchange rate movements when assessing their impact on inflation.

Furthermore, it is evident that oil prices also have a significant influence on shaping inflation rates. Positive changes in oil prices lead to a decrease in inflation rates, while negative changes result in an increase in inflation rates over time. This asymmetrical effect highlights the vulnerability of Algeria's economy to global oil price fluctuations and emphasizes the need for sound fiscal and monetary policies to mitigate their impact on inflation.

In conclusion, gaining insight into the short-term effects of monetary mass on inflation requires a comprehensive analysis of various factors, including demand for money, exchange rate movements, and oil price volatility. By considering these interconnected determinants,

policymakers can make informed decisions to stabilize and reduce inflation rates while promoting sustainable economic growth. See references: [2] p. 16-20, [23] p. 6-10.

Table 1: Developed countries.

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS Inflation	(11) EC2SLS Inflation	(12) EC2SLS Inflation
l.Inflation	0.247***	0.246***	0.246***	0.375***	0.367***	0.373***	0.375***	0.367***	0.373***	0.375***	0.367***	0.373***
	(0.029)	(0.029)	(0.029)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)	(0.026)
World Inflation	0.008***	0.008***	0.008***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***	0.006***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Fiscal Deficit	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***	0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fixed Exchange	0.011	0.01	0.007	-0.002	-0.006	-0.004	-0.002	-0.006	-0.004	-0.002	-0.006	-0.004
	(0.020)	(0.020)	(0.020)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)	(0.016)
Inflation	-0.077**	-0.067**	-0.085***	-0.027	-0.018	-0.028	-0.027	-0.018	-0.028	-0.027	-0.018	-0.028

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS Inflation	(11) EC2SLS Inflation	(12) EC2SLS Inflation
Targeting	(0.032)	(0.032)	(0.032)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
FinDev	−0.001*	−0.001**	−0.001**	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***	−0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
InstQual	−0.014	−0.014	0.02	0.006	0.005	0.038**	0.006	0.005	0.038**	0.006	0.005	0.038**
	(0.013)	(0.013)	(0.021)	(0.006)	(0.006)	(0.017)	(0.006)	(0.006)	(0.017)	(0.006)	(0.006)	(0.017)
Per Capita GDP	−0.251**	−0.204	−0.251**	−0.062**	−0.042	−0.062**	−0.062**	−0.042	−0.062**	−0.062**	−0.042	−0.062**
	(0.123)	(0.126)	(0.123)	(0.031)	(0.032)	(0.031)	(0.031)	(0.032)	(0.031)	(0.031)	(0.032)	−0.031
CBI	−0.157***	−0.085	−0.031	−0.083**	−0.004	0.016	−0.083**	−0.004	0.016	−0.083**	−0.004	0.016
	(0.056)	(0.070)	(0.082)	(0.038)	(0.049)	(0.063)	(0.038)	(0.049)	(0.063)	(0.038)	(0.049)	(0.063)
Trade Openness	(0.167)	−0.209*	(0.173)	0.010	0.000	0.010	0.010	0.000	0.010	0.010	0.000	0.010
	(0.114	(0.116	(0.114	(0.059	(0.059	(0.059	(0.059	(0.059	(0.059	(0.059	(0.059	(0.059

Variables	(1) G2SLS Inflation)	(2) G2SLS Inflation)	(3) G2SLS Inflation)	(4) G2SLS Inflation)	(5) G2SLS Inflation)	(6) G2SLS Inflation)	(7) G2SLS Inflation)	(8) G2SLS Inflation)	(9) G2SLS Inflation)	(10) EC2SLS Inflation)	(11) EC2SLS Inflation)	(12) EC2SLS Inflation)
FinDev*CBI		-0.001			-0.001***			-0.001***			-0.001***	
		(0.000)			(0.000)			(0.000)			(0.000)	
InstQual*CBI			-0.077**			-0.066**			-0.066**			-0.066**
			(0.037)			(0.033)			(0.033)			(0.033)
Constant	1.601***	1.391**	1.559***	0.656***	0.569***	0.611***	0.656***	0.569***	0.611***	0.656***	0.569***	0.611***
	(0.531)	(0.544)	(0.531)	(0.143)	(0.147)	(0.145)	(0.143)	(0.147)	(0.145)	(0.143)	(0.147)	(0.145)
Fixed Effects	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Random Effects	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Estimator of Variance	S-A	S-A	S-A	S-A	S-A	S-A	B-C	B-C	B-C	B-C	B-C	B-C

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS Inflation	(11) EC2SLS Inflation	(12) EC2SLS Inflation
Observations	1105	1103	1105	1105	1103	1105	1105	1103	1105	1105	1103	1105
Number of Countries	47	47	47	47	47	47	47	47	47	47	47	47
Ho: Difference in coef. not systematic (p-values)				0.234			0.187					

source: reference [19].

Table 2: Developing countries.

Varia	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

bles	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	G2SLS Inflation	EC2SLS1 Inflation	EC2SLS2 Inflation	EC2SLS3 Inflation
l.Inflation	0.126***	0.125***	0.125***	0.084***	0.090***	0.440***	0.091***	0.098***	0.440***	0.085***	0.093***	0.440***
	−0.018	−0.018	−0.018	−0.017	−0.017	−0.017	−0.017	−0.016	−0.017	−0.016	−0.016	−0.017
World Inflation	0.191***	0.202***	0.189***	0.168***	0.183***	0.173***	0.167***	0.180***	0.157***	0.165***	0.169***	0.018***
	−0.031	−0.032	−0.031	(0.028)	(0.029)	(0.027)	(0.028)	(0.028)	(0.026)	(0.028)	(0.028)	(0.002)
Fiscal Deficit	0.009***	0.009***	0.009***	0.009***	0.009***	0.001***	0.009***	0.009***	0.001***	0.009***	0.009***	0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Fixed Exchange	−0.044***	−0.042***	−0.043***	−0.095***	−0.094***	−0.115***	−0.097***	−0.097***	−0.115***	−0.095***	−0.097***	−0.115***
	(0.016)	(0.016)	(0.016)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Inflation Targeting	−0.100***	−0.099***	−0.100***	−0.073**	−0.075**	−0.060*	−0.069**	−0.071**	−0.060*	−0.073**	−0.073**	−0.060*
	(0.032)	(0.032)	(0.032)	(0.032)	(0.032)	(0.034)	(0.032)	(0.032)	(0.034)	(0.032)	(0.031)	(0.034)
FinDev	−0.002***	0	−0.002***	0.012*	0.014*	−0.003***	0.012*	0.014*	−0.003***	0.008	0.002	−0.003***

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS1 Inflation	(11) EC2SLS2 Inflation	(12) EC2SLS3 Inflation
	(0.001)	(0.001)	(0.001)	(0.007)	(0.007)	0.000	(0.007)	(0.007)	0.000	(0.005)	(0.004)	0.000
InstQual	-0.002	-0.003	0.02	0.012**	0.013**	0.017**	0.012**	0.012**	0.017**	0.01	0.01	0.017**
	(0.013)	(0.013)	(0.031)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)	(0.006)	(0.006)	(0.008)
Per Capita GDP	0.159**	0.162**	0.158**	0.029	0.047**	0.077***	0.029	0.046**	0.077***	0.016	0.03	-0.163**
	(0.069)	(0.069)	(0.069)	(0.025)	(0.023)	(0.018)	(0.024)	(0.022)	(0.018)	(0.026)	(0.025)	(0.067)
CBI	-0.025	0.104	0.029	-0.06	0.204**	-0.044	-0.063	0.185*	-0.044	-0.071	0.031	-0.044
	(0.065)	(0.093)	(0.095)	(0.045)	(0.103)	(0.059)	(0.044)	(0.099)	(0.059)	(0.046)	(0.084)	(0.059)
Trade Openness	0.126*	0.12	0.124*	0.327***	0.265***	0.228***	0.323***	0.262***	0.228***	0.316***	0.260***	0.228***
	(0.074)	(0.074)	(0.074)	(0.059)	(0.053)	(0.049)	(0.058)	(0.052)	(0.049)	(0.056)	(0.052)	(0.049)
FinDev*CBI		-0.004*			-0.010***			-0.009***				0.647***
		(0.002			(0.003			(0.003				(0.161

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS1 Inflation	(11) EC2SLS2 Inflation	(12) EC2SLS3 Inflation
		)			)			)				)
InstQual*CBI			-0.045			-0.025**			-0.025**		-0.025**	
			(0.058)			(0.012)			(0.012)		(0.012)	
Constant	0.886***	0.674***	0.778***	0.918***	0.754***	0.778***	0.915***	0.755***	0.389***	0.788***		
	(0.226)	(0.229)	(0.229)	(0.115)	(0.120)	(0.229)	(0.112)	(0.116)	(0.070)	(0.150)		
Fixed Effects	YES	YES	YES	NO	NO	NO	NO	NO	NO	NO	NO	NO
Random Effects	NO	NO	NO	YES	YES	YES	YES	YES	YES	YES	YES	YES
Estimator of Variance	S-A	S-A	S-A	S-A	S-A	S-A	B-C	B-C	B-C	B-C	B-C	B-C
Observations	2204	2204	2204	2269	2269	2330	2269	2269	2330	2269	2269	2330
Numb	115	115	115	116	116	115	116	116	115	116	116	115

Variables	(1) G2SLS Inflation	(2) G2SLS Inflation	(3) G2SLS Inflation	(4) G2SLS Inflation	(5) G2SLS Inflation	(6) G2SLS Inflation	(7) G2SLS Inflation	(8) G2SLS Inflation	(9) G2SLS Inflation	(10) EC2SLS1 Inflation	(11) EC2SLS2 Inflation	(12) EC2SLS3 Inflation
er of Countries												
Ho: Difference in coef. not systematic (p-values)				0.267			0.235					

source: reference [19].

6.2. Implications of causal relationship analysis

Analyzing the causal relationship of inflation in Algeria is vital for grasping the impact of economic policy indicators. Previous research has indicated that uncertainty in monetary policy does not significantly affect the demand for money in Nigeria. However, it has been established that both domestic macroeconomic policies and external factors have an impact on inflation in Algeria over the long term. Moreover, the nominal effective exchange rate and unitary import prices play a significant role in long-term inflation in Algeria, accounting for a considerable portion of predicted inflation.

It has also been suggested that fluctuations in the nominal exchange rate can influence inflation due to the weight of imported goods in the Algerian consumer basket. When the domestic currency depreciates, the cost of imported goods is expected to rise, leading to an increase in inflation. Therefore, it is important to consider both monetary policy uncertainty and exchange

rate movements when analyzing causal relationships related to inflation in Algeria.

Furthermore, an asymmetric nature has been observed in the short-term relationship between variables associated with monetary policies used to stimulate or contract the economy. This emphasizes the significance of considering both short and long-term effects when examining causal relationships between economic policy indicators and inflation.

In conclusion, these findings underscore the complexity of causal relationships between economic policy indicators and inflation in Algeria. It is crucial for policymakers to take these factors into account when formulating effective monetary policies to combat inflation. See references: [1] p. 11-15, [5] p. 36-40, [15].

Table 3: Descriptive statistics.

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	Inflation									
Pakistan	1992(7) - 2022(12)	7.42	19.89	1.346	3.52	0.64	3.72	33.78	0.00	366
India	1992(7) - 2022(12)	6.32	16.88	0.42	2.74	0.63	3.26	25.37	0.00	366
Kyrgyzstan	2004(1) - 2022(12)	6.80	24.64	-0.76	5.73	1.07	3.45	45.93	0.00	228
Algeria	2006(1) - 2022(12)	4.55	9.64	-0.33	2.22	0.21	2.49	3.80	0.14	204
Congo	2006(2) -	2.80	10.61	-4.39	2.64	0.56	3.57	13.51	0.00	203

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2022(12)									
Morocco	2008(1)-2022(12)	1.61	7.88	-1.96	1.69	1.63	6.54	173.86	0.00	180
Vietnam	2002(12)-2022(12)	6.02	22.20	-0.81	4.71	1.52	5.14	139.82	0.00	241
Bangladesh	2011(1)-2022(12)	6.19	11.45	4.80	1.50	1.97	6.37	161.86	0.00	144
Mongolia	2007(1)-2022(12)	8.38	25.68	-0.27	5.23	0.95	4.40	44.79	0.00	192
Nepal	2006(1)-2022(12)	6.25	12.13	-2.31	3.09	-0.54	2.83	10.26	0.00	204
Sri Lanka	2011(1)-2022(12)	7.24	42.15	-0.59	8.29	3.14	12.40	768.19	0.00	144
Cambodia	2002(1)-2022(1	3.95	26.62	-6.71	4.46	2.47	12.25	1156.80	0.00	252

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2)									
Egypt	1993(7) - 2022(12)	8.19	25.21	1.78	4.71	1.10	4.55	108.18	0.00	354
Ghana	1998(9) - 2022(12)	12.92	38.80	0.43	6.90	1.83	6.95	353.64	0.00	292
Kenya	2010(2) - 2022(12)	6.40	16.97	3.18	2.79	1.93	6.99	200.10	0.00	155
Mauritania	2011(1) - 2022(12)	3.33	9.55	-0.67	1.64	0.68	4.21	20.01	0.00	144
Nigeria	2006(1) - 2022(12)	10.65	17.84	2.93	3.03	0.01	2.63	1.10	0.57	204
S. Africa	1998(3) - 2022(12)	4.99	12.43	-2.01	2.36	-0.15	4.37	24.75	0.00	298
Philippines	2011(1) - 2022(1	3.08	7.71	-0.52	1.58	0.35	3.32	3.65	0.16	144

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2)									
Uzbekistan	2011(1) - 2022(12)	10.78	16.55	6.67	2.38	0.39	2.54	5.09	0.07	144
Uganda	2011(1) - 2022(12)	5.47	21.54	1.52	4.35	2.06	6.91	194.47	0.00	144
Zambia	2011(1) - 2022(12)	9.43	19.51	5.47	4.26	1.15	2.83	32.25	0.00	144
Policy Rate										
Pakistan	1992(7) - 2022(12)	11.25	20.20	6.06	3.47	0.55	2.49	22.72	0.00	366
India	1992(7) - 2022(12)	7.67	12.21	3.94	2.30	0.59	2.64	23.46	0.00	366
Kyrgyzstan	2004(1) - 2022(12)	6.61	16.04	0.84	3.27	1.02	3.31	40.61	0.00	228
Algeria	2006(1) -	3.82	4.03	2.93	0.30	-1.89	5.52	177.09	0.00	204

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2022(12)									
Congo	2006(2)-2022(12)	19.18	74.93	1.82	17.32	1.41	4.67	91.75	0.00	203
Morocco	2008(1)-2022(12)	2.56	3.48	1.46	0.63	-0.37	1.90	13.30	0.00	180
Vietnam	2002(12)-2022(12)	6.87	15.10	3.90	2.61	1.71	5.55	183.82	0.00	241
Bangladesh	2011(1)-2022(12)	4.92	5.81	3.96	0.31	-1.41	7.62	176.58	0.00	144
Mongolia	2007(1)-2022(12)	10.59	15.03	5.66	2.17	-0.59	2.98	11.14	0.00	192
Nepal	2006(1)-2022(12)	6.61	8.04	4.93	0.91	-0.26	2.51	4.40	0.11	204
Sri Lanka	2011(1)-2022(1	13.32	15.79	4.25	3.66	-1.81	4.41	90.79	0.00	144

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2)									
Cambodia	2002(1) - 2022(12)	5.17	10.15	0.62	2.22	0.22	2.57	4.00	0.13	252
Egypt	1993(7) - 2022(12)	11.36	19.37	8.04	2.70	1.06	3.34	68.14	0.00	354
Ghana	1998(9) - 2022(12)	19.39	41.71	12.37	5.61	0.90	3.60	44.53	0.00	292
Kenya	2010(2) - 2022(12)	9.25	18.58	5.52	2.71	1.74	6.31	149.99	0.00	155
Mauritania	2011(1) - 2022(12)	8.18	9.10	6.91	0.98	-0.36	1.14	23.97	0.00	144
Nigeria	2006(1) - 2022(12)	11.27	15.55	5.86	2.42	-0.75	2.75	19.77	0.00	204
S. Africa	1998(3) - 2022(1	8.15	21.98	3.35	3.62	1.37	5.10	148.93	0.00	298

Country	Period	Mean	Maximum	Minimum	St. Dev	Skewness	Kurtosis	JB Test	Prob	Obs.
	2)									
Philippines	2011(1) - 2022(12)	3.47	5.08	1.92	0.81	-0.44	2.28	7.85	0.01	144
Uzbekistan	2011(1) - 2022(12)	12.56	17.04	8.77	2.47	-0.09	1.78	9.15	0.01	144
Uganda	2011(1) - 2022(12)	13.29	28.39	6.39	5.61	0.83	3.04	16.78	0.00	144
Zambia	2011(1) - 2022(12)	14.32	22.45	7.29	3.88	0.21	1.97	7.38	0.02	144

source: reference [12].

6.3. Policy implications based on long-term equilibrium relationship findings

The econometric study using the ARDL model revealed several key policy implications for tackling inflation in Algeria. Fiscal dominance and broad money were found to have a negative impact on inflation, while the interest rate on Treasury Bills had a positive association with inflation. Diversifying into other industries and curbing excessive government expenditure through fiscal restraint and improved financial management were recommended to reduce reliance on oil revenue and make the economy more resilient to crude price fluctuations.

The study also emphasized the asymmetric effect of oil price volatility on inflation rates, suggesting the need to enhance cash reserves and invest in other projects to diversify the Algerian economy and mitigate the impact of oil price fluctuations.

Monetary mass was identified as a significant long-term determinant of inflation, with M2 being the most important factor, followed by non-oil real GDP and imported goods prices. Short-term analysis showed that money supply and imported goods prices were driving factors for short-term inflation changes.

To address these findings, it is recommended to implement a combination of monetary and fiscal policies accompanied by structural reforms to contain current public spending and tighten monetary policy through interest rate adjustments. Additionally, enhancing financial surpluses resulting from an increase in oil prices can aid in maintaining price stability over both short- and long-term periods. These policy implications are crucial for policymakers aiming to effectively address inflation in Algeria while promoting sustainable economic growth. See references: [2] p. 16-20, [11] p. 11-15, [22].

7. Conclusion

In summary, the research on the impact of economic policy indicators on inflation in Algeria has provided valuable insights. The empirical evidence from various studies has emphasized the significant role of monetary policy in influencing inflation. The hyperinflation episode in Zimbabwe has highlighted that uncontrolled printing of money resulted in exponential growth in money supply, fueling the inflation spiral. This underscores the importance of strong institutional arrangements and central bank independence in ensuring price stability.

Moreover, the study on Tanzania using nonlinear ARDL approaches uncovered a long-run equilibrium relationship between inflation and unemployment, with asymmetrical trade-offs in the short run. This finding is supported by evidence from existing literature and emphasizes the need for policy measures to address unemployment and inflation dynamics.

Additionally, the examination of long-run stability of money demand and monetary policy in Algeria offered crucial insights for improving monetary policy. The stability of long-term money demand for M2 and M1 aggregates suggests potential measures to enhance monetary policy effectiveness.

Furthermore, the SVAR analysis for Algeria highlighted the negative impact of monetary policy shocks on real GDP, emphasizing the need for prudent monetary policies to support economic growth.

The study on central bank independence and inflation in Africa underscored that well-developed financial systems and institutions play a crucial role in achieving lower inflation rates.

Finally, there is a significant negative link between inflation and income inequality, with implications for future research to understand how these variables interact and influence each other.

Overall, these findings have important implications for policymakers in Algeria to formulate effective economic policies to manage inflationary pressures while promoting sustainable economic growth. See references: [3] p. 26-30, [8] p. 11-15, [18] p. 21-25, [19], [20] p. 21-25, [23] p. 31-35.

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