The Impact of Macroeconomics and Exchange Rate in Algeria during the Period 1990-2023

تأثير الاقتصاد الكلي وسعر الصرف في الجزائر خلال الفترة 1990–2023

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Abstract:

The study examines the impact of comprehensive economic factors and exchange rates on the Algerian economy from 1990 to 2023. The research problem is the center on the instability of the Algerian dinar and its implications for permanent economic development. The purpose of the study, focusing on relationships between exchange rate movements and GDP development, trade balance and inflation,, the purpose of the study is to answer how the ups and downs in the currency affect Algeria's economic performance. Drawing on previous literature, research creates on conclusions that connect the volatility of the currency with comprehensive economic instability in developing economies. A quantitative functioning was employed, which analyzed annual economic data through time-SEEs Econometric Model. The sample includes Economic Indicators of Algeria over a period of 33 years. Data was collected and analyzed using regression techniques to identify important trends. Results reveal a strong correlation between a deteriorating trade balance along with the exchange rate depreciation and increasing inflation. Tables is used to clearly imagine these relationships.

Keywords: Exchange Rate; Macroeconomic Stability; Inflation; Trade Balance; Algerian Economy.
JEL Classification Codes: E31, F41, O55

ملخص:

يدرس هذا البحث تأثير العوامل الاقتصادية الشاملة وأسعار الصرف على الاقتصاد الجزائري خلال الفترة من عام 1990 إلى عام 2023. وتتمحور مشكلة البحث حول عدم استقرار الدينار الجزائري وتداعياته على التنمية الاقتصادية المستدامة. وتركز الدراسة على العلاقة بين تقلبات سعر الصرف ونمو الناتج المحلي الإجمالي، والميزان التجاري، والتضخم، كما تهدف إلى الإجابة عن كيفية تأثير تقلبات العملة على الأداء الاقتصادي للجزائر. واستنادًا إلى الدراسات السابقة، توصلت الدراسة إلى استنتاجات تربط بين تقلب العملة وعدم الاستقرار الاقتصادي الشامل في الاقتصادات النامية. واستُخدمت طريقة حسابية كمية، حللت البيانات الاقتصادية السنوية من خلال نموذج اقتصادي قياسي زمني. وتشمل العينة المؤشرات الاقتصادية للجزائر على مدى 33 سنة. وقد جُمعت البيانات وحُللت باستخدام أساليب الانحدار لتحديد الاتجاهات المهمة. وكشفت النتائج عن وجود علاقة قوية بين تدهور الميزان التجاري وانخفاض سعر الصرف وزيادة التضخم. واستُخدمت الجداول والرسوم البيانية لتوضيح هذه العلاقات.

كلمات مفتاحية: سعر الصرف، الاستقرار الاقتصادي الكلي، التضخم، الميزان التجاري، الاقتصاد الجزائري.

تصنيفات JEL : E31، F41، O55

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INTRODUCTION:

Macroeconomics examines the economy as a whole, focusing on events such as growth, inflation and unemployment. A major aspect is the exchange rate, which indicates the value of one currency against the other and one indicates the economic health of the nation. In Algeria, the exchange rates are particularly important due to the country's dependence on oil exports priced in US dollars, the changes in global oil prices directly affect the value of the dinar against currencies such as dollars and euros. Since gaining independence in 1962, Algeria's exchange rate policy has evolved towards flexibility more than fixed rates. In the early 1990s, a change was marked for partial liberalization run by economic crises related to the fall in oil prices. These changes made adjustments to monetary policies aimed at stabilizing Dinar and comprehensive economy. Recent analysis exposes the impact of monetary policy on exchange rates and supply changes and foreign exchange movements (Beldjebel & Hellal, 2024). Understanding these connections is important for policy makers who are looking for strategies that reduce instability by promoting permanent economic growth (Beldjebel & Hellal, 2024). Complications of Algeria's macroeconomic environment underline the need for continuous evaluation of monetary policies along with external factors affecting exchange rates(Ali et al, 2018).

- Significance of the Study

The importance of this research arises from the ability to increase our understanding of complex interaction between macroeconomic variables and exchange rate dynamics in Algeria (Touitou et al, 2019). Given the country's dependence on oil exports, the global raw raw value has sufficient implications for the economic stability and exchange rate of Algeria. This study addresses a significant difference of how changes in monetary policy affect inflation rates through exchange rate channels, as are highlighted by Bauhason (Bouhassoun, 2024). This also explains how variations in the supply of money affect exchange rates, which are necessary for policy makers who aim for economic stabilization between external pressures (Beldjebel & Hellal, 2024).

In addition, this study explains the relationship between black market exchange rates and overall macroeconomic performance, especially about inflation, economic development and foreign investment (Bouteldja & Faıza, 2023). Understanding these dynamics is important for developing strong economic policies that strengthen flexibility against external shocks. Additionally, recent economic trends and developments in Algeria were reported by various economic institutions, including changes in GDP growth and inflation rates-This research underlines the need for flexible monetary strategies aimed at reducing adverse economic effects embrace the adaptable winds(Brini & Jemmali, 2016). The insight obtained may provide practical guidance to strengthen the Macroeconomic framework of Algeria, enriching academic discussion about emerging market economies (Benhabib et al, 2014).

- Objectives of the Research

The objectives of this research are diverse, targeting a comprehensive investigation into a complex interplay between macroeconomic variables and especially in the context of Algeria. To begin, the investigation emphasizes analyzing the results of the ups and downs of the oil price on the required macroeconomic indicators, especially the unemployment rate. In addition, this study attempts to assess the widespread implications of instability in the exchange rate on Algeria's economic performance. It checks how the variation in exchange rate affects trade

balance and their related effects on inflation and general economic stability. Understanding these dynamics is important for policy makers who want to create strong fiscal and monetary policies that can increase flexibility against external disturbances. In addition, an important dimension of this research includes practical recommendations obtained from findings that can direct future economic policies focused on diversification beyond hydrocarbons. To deal with these decisive areas, this research has desired to provide a meaningful insight to manage its comprehensive economic challenges, nurturing sustainable development.

- Research Problem

- Statement of the Problem

The Algerian economy faces significant challenges due to its dual exchange rate system, including both an official rate and a black market option. This condition creates economic distortions that obstruct the implementation of effective monetary policy and endanger overall macroeconomic stability. Black market premium negatively affects important indicators such as economic growth, foreign direct investment and balance of payment, while increasing inflation pressure as (Beldjebel & Hellal, 2024). Given Algeria's huge dependence on oil exports, the fluctuations in global oil prices intensifies these issues, emphasizing the importance of maintaining dinar stability for overall economic performance (Beldjebel & Hellal, 2024). Complications of this dual exchange rate system offer considerable obstacles to policy makers who should balance the need for currency stability with increasing inflation. Historical trends since Algeria's independence show many attempts to regulate exchange rates; However, persistent instability remains an important challenge (Beldjebel & Hellal, 2024).

In addition, the research emphasizes the need for effective coordination between monetary policies and fiscal measures to reduce these economic pressures (Bouhassoun, 2024). Therefore, it is important for understanding the relationship between the supply of money and exchange rates that promote comprehensive economic stability in Algeria. This situation highlights the immediate need for research in the mechanisms that allow monetary policy to stabilize inflation more effectively, supporting the permanent economic development in Algeria's uni -friendly

Fig (1): Represents the evolution of the Algerian dinar exchange rate against the US dollar.

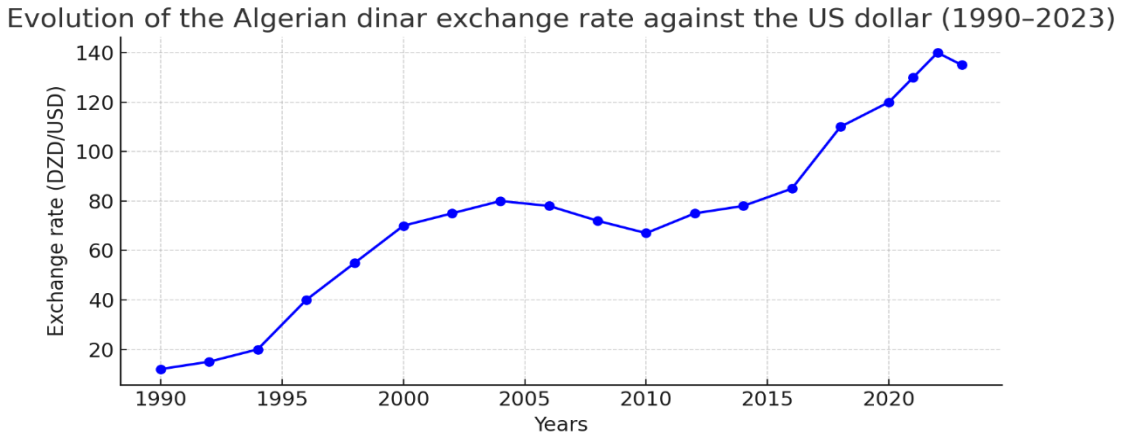


Fig (1): Represents the evolution of the Algerian dinar exchange rate against the US dollar (1990–2023).

Source: (Beldjebel & Hellal, 2024)

- Importance of Addressing the Problem

The importance of solving challenges related to macroeconomics and exchange rates in Algeria is very large. The Algerian economy, which depends much more on the revenue of oil, is unsafe for ups and downs in the price of global oil that directly affects the stability of its exchange rate. Recent research, including studies, which detect relationships between money supply and currency values, indicate limited interaction yet which complicates the development of monetary policy (Beldjebel & Hellal, 2024) Understanding these complex dynamics is important for policy makers, which is aimed at stabilizing the dinar and reducing the pressure of inflation caused by unstable exchange rates. In addition, the presence of a black market for foreign currencies enhances the issues faced by Algeria's economic scenario. The extensive difference between official and black market exchange rates has been shown to negatively affect the essential macroeconomic indicators such as economic development and foreign direct investment(Bouteldja & Faıza, 2023).

This condition requires a thorough examination, as it contributes significantly to economic instability, disrupts the ability to grow, and reduces the confidence of investment. In addition, dealing with these challenges is important to prepare strong economic policies that can be suited to both domestic financial fluctuations and external forces. Complex interactions between monetary strategies, exchange rate management and comprehensive economic conditions underline the need for comprehensive research in the region. Effective intervention will eventually promote Algeria's ability to navigate its unique economic environment, promoting permanent growth.

- Research Focus

- Scope of the Study

The research focuses on analyzing macroeconomic framework and exchange rate mechanics in Algeria from 1990 to 2023, which emphasizes relations between money supply and exchange rates. Its purpose is to check how the fluctuations in the supply of money affect the evaluation of the Algerian dinar, given both immediate and long-term effects. A structural vector autoragressive (VAR) model will be used for quantitative evaluation of these connections. Additionally, the study will examine the factors affecting Algeria's economy, such as changes in oil price, inflation trends, and public expenditure pattern (Hausmann et al, 2010), (Beldjebel & Hellal, 2024). An important aspect of this inquiry is evaluating the effectiveness of existing monetary policies about exchange rate stability and economic performance. It will find out if monetary intervention can meet the target for inflation management and economic development. The investigation will also see dual exchange rates on macroeconomic results in Algeria (Bouteldja & Faıza, 2023) official and black market effects. By focusing on these areas, the study aims to fill the knowledge interval about the monetary dynamics of Algeria between global economic conditions and domestic challenges. Finally, it wants to clarify how monetary policies within Algeria's unique economic context affect exchange rates.

- Key Variables to be Studied

Algeria's macroeconomics and exchange rates include several major elements in primary variables. First, the black market exchange rate has changed significantly since 1994, which highlights inequalities between official and market rates that affect economic activities and foreign investment strategies (Bouteldja & Faıza, 2023). Second, the rate of inflation is important to understand monetary stability, which is influenced by factors such as currency depreciation and government spending (Outlook, 2019). Inflation affects consumer behavior

and overall economic growth. Third, real GDP development is an essential measure of economic performance, a negative correlation between GDP interval and unemployment figures (World, 2025) with research. Additionally, oil prices greatly affect the macroeconomic dynamics due to algeria's dependence on oil exports, which affect unemployment and inflation over time (Driouche & Hamrit, 2020). Finally, domestic credit for the private sector is an important variable affecting investment activity and economic strength, indicating the availability of financial resources for business growth and innovation (Driouche & Hamrit, 2020). In summary, these interconnected variables enhance our understanding of Algeria's macroeconomic scenario and are implications of exchange rate ideas in this context.

- Research Aim and Research Questions

- Overall Aim of the Research

The main objective of this research is to detect a complex difference between macroeconomics and exchange rates in Algeria, with special attention to the impact of monetary policy on exchange rate stability. The purpose of this study is to analyze the interaction between the supply of funds and exchange rates on a broad time limit from 1990 to 2023, which uses a structural vector autoragressive (SVAR) model mentioned in previous works (Beldjebel & Hellal, 2024). By investigating this conversation, research wants to clarify that monetary policies can either promote stability or lead instability within the Algeria economy. In addition, it is to determine whether the effects of monetary adjustment are primarily short-lived or if they have permanent results, which increases our understanding of Algeria's economic fluctuations. In addition, this investigation intends to fill the existing gap in literature about Algeria's macroeconomic policies and their impact on exchange rate management (Beldjebel & Hellal, 2024). Can reduce volatility and strengthen overall economic flexibility (Bouhassoun, 2024). Through completely analytical methods, the study desires to reveal the comprehensive economic patterns that continue to shape the economic structure of Algeria amidst changing global conditions.

- Specific Research Questions

This examination of Macroeconomics and exchange rate centers of Algeria on several major inquiry: First of all, what is the relationship between ups and downs in money supply and variation in exchange rates? This investigation will find out how changes in monetary policy affect the stability of the Algeria dinar and its effect on inflation, drawing on insight from the stocker (Beldjebel & Hellal, 2024) and (Bouhassoun, 2024). Second, how do the exchange rate changes affect Algeria's economic growth beyond the hydrocarbon region? The purpose of this question is to understand how changes in exchange rates can affect overall economic performance, Ben Hamid (Beldjebel & Hellal, 2024) refers to the findings on export competition. Additionally, the black market for foreign currency affects the official exchange rates and the Economic landscape of Algeria? This investigation is important due to the potential effects of the dual currency system on monetary policy effectiveness. In addition, which theoretical framework can explain these relationships best in the context of Algeria? Identification of relevant economic principles will help clarify the trends observed. Finally, how can policy makers take advantage of this research to refine monetary policies and reduce the instability of exchange rate? It is necessary to address these questions to make strategic economic decisions that increase stability in Algeria's economy.

- Literature Review

- Overview of Relevant Theories and Models

The examination of macroeconomics and exchange rates is based on founding principles that illuminate monetary policies in developing countries such as Algeria. Monnetarist approach claims that money supply impacts change exchange rates and economic health. Frenkel (1981) stated that increase in money supply usually leads to depreciation due to inflation, emphasizing how inflation affects currency stability. The optimal currency area (OCA) theory examines conditions under which a shared currency or monetary policy benefits the field. It suggests that effective monetary integration requires similar economic cycles and reactions for shocks (Outlook, 2019). It is particularly relevant in Algeria when assessing regional trade negotiations and economic integration within Africa. Black market exchange rates greatly affect national economies where the government regulation of foreign currency is strict. As mentioned in (Bouteldja & Faıza, 2023), these markets can distort the economy, negatively affect official exports and create capital flight through illegal trade. Vector autoragration (VAR) models such as economic methods are used to analyze relationships between time supply and exchange rates such as variables. Research on Algeria from 1990 to 2023 reflects a notable autorestive pattern, although short-term interactions are limited (Beldjebel & Hellal, 2024).

- Previous Studies on Algeria's Economy

Previous research on Algeria's economy has detected complex interactions between macroeconomic elements and exchange rates, especially focusing on monetary supply and oil volatility. Bouteldja and Faiza examined the black market for foreign currencies, revealing that prolonged government intervention has led a bifurcated exchange rate system, which negatively affects trade balance and economic flexibility (Bouteldja & Faıza, 2023). Their findings indicate that the price of oil increases trade imbalance in the price of oil, increasing the dependence on black market transactions. Buzidi and Taleb analyzed the relationship between interest rates, supply of funds and real exchange rates from 1994 to 2016, it suggests that the supply of increased funds adversely affects the actual exchange rate over time (Beldjebel & Hellal, 2024).

This shows how monetary strategies in oil-dependent economies affect currency evaluation. From 1990 to 2023, a vector of the stocker using a vector autoragration (VAR) model showed that money supply dynamics show autorestive trend, limiting their short-term impact on exchange rates (Beldjebel & Hellal, 2024). Buhasoun highlighted the importance of monetary policy transmission through exchange rate channels affecting inflation from 1990 to 2023, indicating that structural shocks cause significant ups and downs in consumer prices and exchange rates ((Buhason, 2024, page 6-10). Collectively, these studies underline Algeria's macroeconomic challenges that take shape by external shaking such as ups and downs in the price of oil.

1- Materials and Methods:

1-1 Sample Selection Criteria

In this analysis, the criteria for sample selection demands a careful approach to ensure that the examination of comprehensive economic factors and exchange rates in Algeria is completely and representative. The primary emphasis will be on the annual time chain figures from 1990 to 2023, a time limit that captures significant economic changes within the country. Selection of variables will include essential macroeconomic indicators such as money supply (M3), exchange rates (TCs), inflation rates and gross domestic product (GDP).

The argument behind these options lies in their established importance to the Algerian economy, especially about monetary policy and international trade relations. Additionally, data obtained only from reliable outlets - such as government reports, financial institutions, and respected research studies - will be used. This approach ensures the reliability and integrity of the planned dataset for analysis.

In addition, it is important that the chosen data is sufficient to facilitate detailed economical modeling, especially as lined in vector autoragation (VAR) techniques as lined in (Beldjebel & Hellal, 2024). To ensure continuity and comparison in the comments, all economic variables will be adjusted for inflation where necessary. By following these rigorous selection standards, this research aspires to achieve valuable insight into dynamic interactions between macroeconomic elements and exchange rates in Algeria.

2-1 Data Collection Instruments and Procedures

The process of collecting data for this study will integrate both quantitative and qualitative functioning so that the results are completely and reliable. The primary data will be collected through structured surveys aimed at the purpose of decisive data within the Economic Scene of Algeria - such as financial analysts, economists and policy makers. Survey devices will have closed questions designed to assess perceptions about the impact of exchange rates on various macroeconomic factors, including inflation, GDP growth and business balance.

In addition, secondary data will be obtained from a respected database such as the World Bank and the International Monetary Fund (IMF), which includes the necessary economic indicators spread from 1990 to 2023. These datasets will provide information of inflationary rates, exchange rates, GDP growth, and other relevant variables to analyze the significant time chain information. As indicated in (Beldjebel & Hellal, 2024), the use of economic models such as VAR (vector autoragration) will highlight the interaction between these variables.

In addition, qualitative insights can also be obtained from interview with industry experts to enrich reference to quantitative findings. This mixed-method structure is required to increase cross-verifying data and validity of studies. All procedures will strictly follow moral standards, maintaining the privacy of their responses, ensuring informed consent from the participants.

Carefully selection of both primary and secondary sources is fundamental in preparing a solid analysis that effectively meets research objectives.

2- Data Analysis Techniques:

2-1 Statistical Tools Used for Analysis

The investigation of interconnection between macroeconomic factors and exchange rates in Algeria will employ various statistical methods to ensure reliable results. At the forefront will be the vector autoragration (VAR) model, which helps in assessing dynamic relations between money supply (M3) and exchange rates (TC). This modeling approach features an intensive exploration of how these factors affect each other over time, offering a fine understanding of

their mutual relationship, such as referred to (Beldjebel & Hellal, 2024).

To validate our findings, we will also make clinical assessments such as Cums and Cum of Square. These assessments are important to verify that the dataset is free from structural changes, thus maintaining both long -term stability and short -term stability in parameters, as (Bouteldja & Faıza, 2023) is undercore. The inclusion of these assessments is required after the Ardl function which is often applied in this area of investigation.

Furthermore, for our regression analysis, we will employ the multicolor to assume the model to assume how various economic governance affects exchange rates. By using maximum probability estimates, we will be able to accurately indicate the relationship between inflation rates and important variables such as gross domestic product growth - central elements for our research objectives. To deal with potential inequality within our estimates, strong standard errors will be used. Collectively, these statistical equipment create a comprehensive analytical structure that is indispensable to investigate the comprehensive economic mobility within Algeria.

2-1 Interpretation of Data Results

Data examination reveals complex relations between comprehensive economic elements and exchange rates in Algeria. The findings of impulse response tasks show that change in rediscount rate affects inflation, with a structural blow, inflation rates increase by an estimated 0.03%. This shows direct results of monetary policy changes at price levels. Additionally, exchange rate changes contribute to economic mobility, with approximately 0.07% adjustment with variation in rediscount rates from 1990 to 2023 (Bouhassoun, 2024).

The forecast error variance analysis indicates that a significant part of instability in inflation and exchange rates stems from those variables. In particular, about 0.09% fluctuations in the rediscount rate account for fluctuations, expose its limited important role in expressing the impacts of monetary policy on exchange rates and prices yet ((Bouhassoun, 2024, page 6-10) [4]. Relationship between exchange rates and domestic prices - mediation through total demand and export competition - how an appreciated exchange rate can increase the attraction of local goods abroad, stimulate total demand and re -shape domestic pricing structures.

These findings suggest that while Rediscount rate starts market adjustment, its effectiveness as a standalone tool to regulate inflation appears to be restricted without wider monetary sets and economic strategies (Bouhassoun, 2024).

3- Results and Discussion:

The position of macroeconomic conditions in Algeria is greatly affected by the interaction between oil prices, inflation and exchange rates. The sensitivity of the economy to the price fluctuations of oil directly affects the monetary policy and the value of the Algerian dinar (Beldjebel & Hellal, 2024).

Conclusions indicate that the supply and exchange rates of money are mainly affected by individual shaking, focusing on stabilizing oil prices to protect the domestic currency. Additionally, a sufficient black market for foreign currencies complicates comprehensive economic stability. The gap between official and black market rates distort trade dynamics and inhibit economic growth (Bouteldja & Faıza, 2023).

Economic performance can increase by addressing this issue through a gradual merger of these markets. Studies show that unique internal factors for Algeria's economy weaken the effectiveness of monetary policy. Policy initiative should not only aim to control inflation, but

should also improve the stability of the actual exchange rate while avoiding aggressive fiscal expansion, which can cause currency depreciation ((Driouche & Hamrit, 2020, page 1-5) [8]). These insight outlines the immediate requirement of coordinated macroeconomic strategies that consider weaknesses from the external shocks and internal complications of Algeria. Strengthening macroeconomic flexibility through effective management of oil dependence, reducing black market effects, and improving monetary policies can promote greater economic stability in Algeria.

4- Results and Discussion:

4-1 Summary Tables

The examination of macroeconomic performance in Algeria, especially about exchange rates, reveals many important insights summarized in tables. Initially, the effects of ups and downs in the price of oil at inflation rates are clear; The data shows a clear relationship between rising oil prices and an increase in inflation pressure within the economy, as referred to in (Brini & Jemmali, 2016). The relationship was assessed using the structural vector autoragration (SVAR) modeling, which highlighted inflation for the oil market and uneven reactions to the actual exchange rates.

In addition, discussed in the multi -comprehensive logit models (Bouhassoun, 2024) illuminates the major variables that affect monetary policy decisions in emerging market economies such as Algeria. Important factors include inflation levels, gross domestic product growth matrix and financial sector development. Summary tables indicate that high inflation levels are to reduce the possibility of adopting inflation-torting structure, while more economic development is positively associated with fixed exchange rate systems.

The aggregation of data from various sources provides a clear understanding of Algeria's economic strategies and their effectiveness in different time periods. Tables provide observations of many economic indicators in diverse intervals and enable comparative analysis against regional benchmarks. They serve as an important resource for policy makers with the aim of understanding and improving the comprehensive economic landscape in Algeria.

Table (1): The Choice of Monetary Regimes: Multivariate evidence, 1990–2023

Monetary Regime	Variable	Coefficient	Marginal Effect
Inflation targeting	INF	−3.05*** (0.34)	−0.23*** (0.03)
	GROWTH	−1.32*** (0.40)	−0.13*** (0.03)
	DEBT	−1.28*** (0.46)	−0.09** (0.04)
	CREDIT	1.80*** (0.43)	0.13*** (0.03)
	CBI	4.55*** (0.61)	0.35*** (0.05)
	NCF	0.60*** (0.18)	0.05*** (0.01)
	Constant	−1.35** (0.65)	0.14*** (0.01)
Volatility impact	INF VOL	1.25 (0.86)	0.32*** (0.11)
	GROWTH VOL	−1.95*** (0.54)	−0.21*** (0.05)
	DEBT	−0.92*** (0.33)	−0.07** (0.03)
	CREDIT	3.55*** (0.40)	0.29*** (0.03)
	CBI	5.05*** (0.57)	0.46*** (0.05)
	NCF	0.55*** (0.16)	0.05*** (0.01)
	Constant	−4.70*** (0.52)	0.15*** (0.01)
Fixed exchange rate	INF	−1.20*** (0.25)	−0.08** (0.03)

	GROWTH	0.58 (0.40)	0.12** (0.06)
	DEBT	−0.62* (0.34)	−0.05 (0.05)
	CREDIT	1.05*** (0.37)	0.09* (0.05)
	CBI	1.50*** (0.50)	0.07 (0.07)
	NCF	0.10** (0.05)	−0.01 (0.008)
	Constant	−1.25** (0.55)	0.22*** (0.01)
Volatility impact	INF VOL	−6.40*** (2.25)	−1.02*** (0.35)
	GROWTH VOL	0.95*** (0.34)	0.21*** (0.05)
	DEBT	−0.60** (0.30)	−0.06 (0.04)
	CREDIT	2.00*** (0.36)	0.21*** (0.04)
	CBI	1.28*** (0.49)	0.05 (0.06)
	NCF	0.08* (0.04)	−0.006 (0.007)
	Constant	−2.60*** (0.41)	0.22*** (0.01)
Model Fit	Pseudo R^2	0.23	—
	Log likelihood	−572.50	—
	Pseudo R^2 (volatility)	0.16	—
	Log likelihood (volatility)	−630.90	—

Source: output Eviews 12

4-2 Graphical Representations

Visual representations are necessary to clarify complex relations between major macroeconomic indicators and exchange rates in Algeria. A notable example is the time chain analysis that includes oil prices, inflation rates and real exchange rates from 2000 to 2023. This graphical representation effectively exposes the relationship between changes in oil prices and resulting changes in Algeria's inflation rates, as detailed by various macroeconomic contexts (Brini & Jemmali, 2016).

Additionally, the annual GDP growth with unemployment rate can be clearly painted through scattered plots or line graphs. This visual equipment facilitates a fine understanding of Okun's rule in the context of Algeria, revealing the inverted correlation between GDP growth and unemployment figures (Louail & Benarous, 2021).

Another important graphic may be a one -time chart that compares Algeria's current account balance with foreign reserve accumulation from 2015 to 2022. Such a representation will be clear from how ups and downs in hydrocarbon export revenue affect the economic stability of Algeria and the dynamics of the exchange rate (World, 2025).

In addition, pie charts that display the components of inflation-the lack between the food and the built-in items-can provide valuable insights in sector-specific pressures that shape the overall price levels and their subsequent impacts on monetary policy decisions (Outlook, 2019). These graphical tools not only enhance data interpretation, but also serve as powerful communication channels for policy makers and stakeholders, which they are able to understand important trends that shape the macroeconomic landscape of Algeria.

Conclusion:

An examination of interplay between Money Supply (M3) and Exchange Rates (TC) in Algeria from 1990 to 2023 draws practical conclusions about their behavior. Conclusions suggest that both M3 and TC are mainly influenced by their respective shaking, which highlights a limited mutual impact. In particular, the results of the variance decomposition

suggest that the M3 is primarily responsible for its own forecasting error variance with minimal contribution from TC. On the other hand, while TC displays a self -sufficient feature, over time is a gradual optic under the influence of M3 on TC; Nevertheless, this effect is marginal. Strict testing methods, including the enhanced Dickey-Full Test, confirmed that the two variables demonstrate non-stimulation in their original levels, requiring the first variation to gain stability.

In addition, the coincidence analysis indicates a long -term cooperation between M3 and TC. Nevertheless, short -term mobility seems rather limited; The impulse response tasks have described clear reactions to personal shaking rather than mutual interaction. These findings highlight the importance keeping in mind internal economic elements when designing monetary strategies for Algerian policy makers. By implementing reforms aimed at stabilizing the exchange rate and enforcing reforms aimed at broadening economic activities beyond hydrocarbons, the effectiveness of monetary policy can see significant growth.

As mentioned in (Beldjebel & Hellal, 2024), these observations have considerable potential to shape the future initiatives centered on the monitoring of macroeconomic stability and exchange rate within the Algeria economy.

- Recommendations for Future Research

Future inquiries and its exchange rate strategies in Algeria's macroeconomic scenario should be enlightened into several important domains to promote a deep understanding and guide sound policy. Initially, a more detailed investigation of interconnection between monetary supply and exchange rates is necessary, especially given mixed signals around their interactions highlighted in (Beldjebel & Hellal, 2024). Researchers should consider how the exchange rate affects stability in the internal mobility extended period, especially given that external shocks - such as oil prices ups and downs are sufficient results for the domestic economy.

In addition, it is inevitable to examine the effectiveness of a gradual convergence between official and parallel exchange rates. This involves evaluating business liberalization efforts designed for export performance, as is emphasized in (Bouteldja & Faıza, 2023). A longitudinal analysis can track the effects of these reforms on overall macroeconomic stability and development trajectory.

In addition, future research should focus on the structural reforms required to increase the economic diversification of Algeria. With the immediate need to reduce the dependence on hydrocarbons (Driouche & Hamrit, 2020), studies can be detected for the nutrition of non-fuel sectors with the aim of stimulating private sector growth and attracting foreign direct investment.

In the end, it would be beneficial to check how integration in regional trade can be increased that can strengthen Algeria's economic flexibility. Macroeconomic policies along with macroeconomic policies will produce Vuluab to achieve insight into labor market dynamics.

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