The impact of exchange rate fluctuations on the flexibility of monetary policy under the problem of inflation in Algeria.
- Standard analytical study during the period (1990-2019)-

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Abstract:

This studyaimedatestimating the impact of exchange rate fluctuations on the inflation and economicgrowth rate in Algeria'smonetary and financialpolicyduring the period (1990-2019), using a simple linearregression model (OLS).

concludedthattherewas, direct relationshipbetween the monetarysupply and exchange rate, and economicgrowth rate (GDP), and there's an inverse relationshipbetween the exchange rate and inflation, information The studyneeds to activatemonetary and financialreform by pursuesound and effective financial and monetarypolicies.

Keywords:exchange rate; monetarysupply; inflation; economicgrowth rate.
JelClassificationCodes: C35, P34, E51, E52, E31, F43.

ملخص:

تهدف هذه الدراسة إلى تقدير تأثير تقلبات أسعار الصرف على معدل التضخم والنمو الاقتصادي في ظل السياسة النقدية والمالية في الجزائر خلال الفترة (1990-2019)، وذلك باستخدام أدوات التحليل القياسية من خلال نموذج الانحدارالخطي البسيط (طريقة المربعات الصغرى *OLS*).

حيث خلصت إلى لوجود علاقة مباشرة بين العرض النقدي وسعر الصرف النمو الاقتصادي (الناتج المحلي الإجمالي)، وهناك علاقة عكسية بين سعر الصرف والتضخم، حيث توصي الدراسة إلى تفعيل الإصلاح النقدي والمالي من خلال إتباع سياسات مالية ونقدية سليمة وفعالة.

كلمات مفتاحية: سعر الصرف، العرض النقدي، التضخم، النمو الاقتصادي.
تصنيف JEL : C35،P34،E51، E52 ،E31،F43 .

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1.INTRODUCTION:

Algeria's de jure fiscal framework is based on a saving rule based on the current oil price. Algeria created an oil stabilization fund (Fonds de Regulation des Recettes, or FRR) in 2000 to insulate the Algerian economy from volatility in hydrocarbon prices. There is a saving rule that stipulates that oil revenue is saved into the FRR above the oil price threshold of US$37 per barrel.

. However, in practice, Algeria's fiscal stance has been heavily influenced by hydrocarbon prices. Public spending is disconnected from the saving rule since the FRR can be freely drawn upon for budget support. The nonhydrocarbon primary deficit (NHPD) and spending have been highly correlated with oil prices for the past 15 years, widening during good times and contracting in bad times.

Subsidies not only carry large fiscal cost but also weigh on external sustainability. Subsidies cost an estimated 13.6 percent of GDP in 2015, with energy subsidies accounting for over half this amount. In addition to their fiscal cost, subsidies have increased domestic energy consumption, squeezing exports and encouraging large-scale smuggling to neighboring-countries.

Algeria needs to adjust to the low oil price realities. Without sustained policy adjustment, a protracted period of low hydrocarbon prices could set the country on an unsustainable trajectory of macroeconomic imbalances. The heavy reliance on hydrocarbons poses structural risks to Algeria's economy, and both monetary and fiscal policies face important challenges to respond to the ongoing oil price shock and preserve a positive outlook for growth, inflation and international reserves.

Well-managed exchange rate flexibility can help the economy better adjust to the low oil price environment. Given the shallow and imperfect exchange market, the central bank should "lead" the market towards a path of exchange rate

adjustment consistent with a medium-term internal and external equilibrium. However, exchange rate adjustment cannot substitute for fiscal and monetary policy adjustment. In addition, these need to be complemented by a structural reform strategy that aims at diversifying exports and replacing imports with domestic production to help preserve growth.

- **Problematic**

Of the foregoing , it is clear that there is a close relation between the exchange rate fluctuations and inflation rates and economic growth make us look at the contents of the various interactions and the effects of this relation , and it can be problematic formulation of this research are as follows: - What is the impact of exchange rate fluctuations on inflation and economic growth rate in Algeria , during the period (1990-2019) ?

- **sub-questions**

a - Is there a relation between the exchange rate and the inflation rate in Algeria ? And what kind ?

b - How do you explain the relation between economic growth and the exchange rate Under the influence of monetary mass flexibility in Algeria ?

- **hypotheses**

a - The exchange rate has a direct impact on inflation as reflected in the impact on economic and social stability of the country.

b- There is a positive relation between a statistically significant amount of the money supply ,economic growth rate, and the increase in the exchange rate in Algeria.

- **The subject of the study**

The study aims to shed light on the relation between exchange rates and macro-economic variables in Algeria during the period (1990-2019).

- **The approach of the study**

- Descriptive: To describe the variables of the study and to clarify economic concepts (exchange rate, money supply, inflation, economic growth).
- Econometric Analytical:To track the evolution of economic variables and to study their statistical impact.

2.THEORETICAL FRAMEWORK

2.1 Monetary policy:

It is one of the means of economic policy, and therefore works to achieve the development goals and maintain the overall monetary balances of the state, by using several monetary variables, also known as those imposed by the government, the central bank or the monetary authority of a country to control the monetary supply, liquidity and interest rates to achieve a set of goals geared towards growth and stability of the economy.**(كريم، 2019، صفحة 26)**

Exchange rate and economic growth:

There is no doubt that the capital markets in developing countries to help in the return of capital National to local investment. This directly contributes to increased growth, considering able to achieve sustained development. Money markets are allowing business opportunities cannot be ignored, and this opportunity has made great achievements in the growth of the economies of some countries. Some of them have been able to achieve an increase in GDP growth reached a three -fold increase in GDP for industrially developed countries, and managed to rein in the deficit , inflation and the privatization process is studied. It also managed several countries like Poland during the seven years that go beyond the transitional phase of its economy are perfect and achieved the highest growth rate in Europe , and has been able to reduce the share of public sector activities in the GDP from 100% to only 33% (Research Center of Finance and Banking) . As the increase in real economic activity and GDP growth increases optimism

about the future, which increases the movement of the stock in trading on the stock market and thus lead to higher prices. This confirms the validity of the hypothesis of the study on the relationship between fluctuations in exchange rates with the size of the gross domestic product of any country. **(park, 2003, p. 40)**

2.2 Exchange rate and inflation:

Inflation is referred to as a continuous increase in the general level of prices for a period of time . Since this increase affect the domestic demand for goods and services , and thus higher prices locally , and also affect the prices of exported goods which reduces the ability of foreign competition and at the same time, the demand for imported goods is increasing , which negatively affects the movement of the current account . And then the balance of payments and hence the stability of the exchange rate in the case of Algeria, the study of the relationship of inflation and expressed by the price index to publish data periodically on indicators figures for consumption , a year and a month , taking the base year is usually based on the data every ten years and change after all period of time , and vary from one state to another they reflect changes in the purchasing power , and it comes here so the scale or index, which assesses the average change that occurs in the price, and indicates some economists that this indicator is not to scale good and effective for inflation in the long term , where he faces analysts difficulties in comparing statistical data of inflation for the prior periods due to corrections used by investigators when collecting prices. **(farid & Benelbar, 2015, p. 07)**

3.MONETARY POLICY IN ALGERIA

Bank of Algeria has since 2010 explicitly targeted price stability, in addition to external stability of the currency. There is an explicit annual inflation target of 4 percent announced by the bank of Algeria. The monetary policy framework has adjusted over time to reflect the developments of the economic environment caused by oil price fluctuations, inflation in Algeria is sensitive to

price control that accounts for 43 percent of the CPI basket which can explain the incomplete pass through of exchange rate to domestic prices founded in the study, because inflation is partly driven by higher import price of international goods. The exchange rate does not explain the short-term inflation dynamic which may be due to short-term price rigidity and structural difficulties related to inadequate market infrastructure and the other difficulties related to transport, distribution channels and excess liquidity in public banks, but there is stable long run relationship between inflation and exchange rate, indeed, the exchange rate depreciation was instrumental in absorbing the negative impact of the oil price shock and had engendered more proceeds that can be used as a buffer against wage increases. The rate of inflation in Algeria will likely remain higher and volatile in the coming years because of the increase in energy prices and taxes such as the value add tax, therefore the central bank should continue to strengthen monetary policy transmission channels such as exchange rate and liquidity forecasting capabilities to help anchor inflation expectation around the target of 4 % announced to the public.**(Hamrit & Sabrina, 2019, pp. 10-11)**

Table.1. Development of some macroeconomic indicators in Algeria during the period (1990-2019)

year	M2	GDP	NER,dollar	INFL	BP
1990	343,324	62,04	12,1	16,65	-0,09
1991	414,745	45,71	18,47	25,88	0,53
1992	544,456	48	21,64	31,66	0,23
1993	584,183	49,94	23,35	20,54	-0,01
1994	675,928	42,54	35,06	29,04	-4,38
1995	739,895	41,76	47,66	29,77	-6,32
1996	848,25	46,94	54,75	18,67	-2,09
1997	1003,16	48,17	57,71	5,73	1,16
1998	1199,46	48,18	58,74	4,95	-1,74
1999	1366,79	48,64	66,57	2,64	-2,38

2000	1559,94	54,78	75,26	0,33	7,57
2001	2403,06	54,74	77,22	4,22	6,19
2002	2836,87	56,76	79,68	1,41	3,65
2003	3299,45	67,86	77,39	4,26	7,47
2004	3644,4	85,2	72,06	3,96	9,25
2005	4070,4	103,198	73,28	1,38	16,94
2006	4827,6	117,025	72,65	2,31	17,73
2007	5994,6	14,97	69,29	3,67	29,55
2008	6956	171	64,58	4,85	36,99
2009	7178,7	137,21	72,65	5,73	3,86
2010	8162,8	161,2	74,39	3,91	15,33
2011	9929,2	200,01	72,94	4,52	20,14
2012	11015,1	209,06	77,54	8,89	12,06
2013	11941,5	209,75	79,37	3,25	0,13
2014	13686,8	21,8	80,58	2,91	-5,88
2015	13704,5	165,97	100,46	4,78	-27,53
2016	13816,3	160,03	109,47	6,39	-21,42
2017	14974,6	167,38	110,96	5,59	-21,76
2018	16636,7	173,75	118,51	4,26	15,82
2019	16510,68	169,98	118,96	6,7	-19,17

Source:**(World Bank (www.worldbank.org))(Algeria, (05-13-28-38-46-48))**

recovering international oil prices and a loosening of the government's purse strings have afforded Algeria some breathing room after a number of challenging years for the economy. As Africa's most important gas exporter, Algeria remains highly dependent on the hydrocarbons sector for the majority of its government's revenues and almost the entirety of its exports. Despite reforms to encourage private sector development, promote diversification and attract foreign direct investment (FDI) in recent years, the state still plays a preponderant role, meaning that changes to government expenditure and investments continue to have a significant impact on overall economic performance.

The drop in global oil prices since 2014 is at the root of Algeria's most recent economic challenges, giving rise to large twin deficits in the fiscal and

current accounts. The correction of such imbalances typically requires actions such as fiscal consolidation and currency devaluation, which can compound economic weakness in the short term. Though the authorities embarked upon this strategy in mid-2016, it was abandoned in October 2017. Instead, increased public spending became the goal for 2018, and the target date for balancing the budget was pushed back from 2020 to 2022. To this end, the authorities have adopted an "quantitative easing" policy, whereby the central bank, the Bank of Algeria, would purchase sovereign bonds directly from the government. This eases the financing pressure on the government by reducing their imperative to issue bonds on the primary market (see analysis). No further significant changes to monetary policy is expected before the next presidential election, which is due to take place in April 2019. Failure to rein in unorthodox macroeconomic policies thereafter could postpone unfavourable circumstances, but may also eventually require stricter financial management measures in the future. When it restarts in earnest, fiscal consolidation is expected to weigh upon growth over the medium term. **(group, 2018, p. 24)**

3.1 Inflation:

With economic growth slowing and liquidity in the banking sector drying up, inflation moderated from an average of 6.4% in 2016 to 5.6% in 2017. The government's revised economic strategy, notably including looser fiscal and monetary policies, was not only expected to support economic growth, but also to lead to a spike in inflation. Average prices during the first seven months of 2018 were 4.5% higher than prices during the corresponding period in 2017. Food prices, which make up nearly half of the basket of goods used to calculate the consumer price index, inflated by around 4%, while the cost of housing, which makes up one-10th of the basket, advanced by only 0.9%. "Inflation has not yet picked up as much as some had feared when the government introduced monetary

financing, which is partly because the index is out of date and does not fully reflect the cost of living, and partly because there has not yet been a big increase in public sector wages," Sekak told OBG. According to October 2018 World Economic Outlook, the IMF projects a pickup in headline inflation to 6.5% in 2018 and 6.7% in 2019. Of greater concern, however, is the fund's longer-range projections that expect inflation to continue accelerating to double figures by 2022. This indicates that, even on the current trajectory, assuming the government gradually withdraws fiscal and monetary policy accommodation, there are long-term risks that consumer price inflation and expectations may become unanchored.

3.2 Depreciation:

The Algerian government initially resisted market pressures to devalue the dinar following the drop in international oil prices. In January 2015 the currency even strengthened slightly to nudge below AD100:€1. By early 2018, however, the dinar experienced a cumulative depreciation of nearly 30% to surpass AD140:€1. With foreign reserves dwindling and the current account deficit set to remain relatively wide, pressures are likely to remain in the direction of further depreciation in the coming years, particularly if the backdrop of a strong dollar and a complicated environment for emerging markets persists, or if the upward trend in oil prices were to reverse. To the extent that the authorities continue to resist more than modest depreciation, there is likely to be increased divergence between the official exchange rate and the effective exchange rate on the informal currency market, a premium running at 45% by mid2018 (see Financial Services chapter). This would further increase the incentives for economic actors to engage in rent-seeking activities by, for example, over-invoicing in foreign currency for imported. **(group, 2018, p. 27)**.

3.3 Economic growth rate:

The relatively fragile Algerian economy especially in last five years according to the deteriorate in oil prices since 2014 is due a high levels of inflation rates and weak monetary policy especially the money supply, but even so, the impact of money supply on the economic growth predominately the GDP per capita has received a very poor attention in the literature of Algerian economy, after the collapse of oil prices in 2014, the Algerian economy entered into a major crisis, for example, the total of government revenues has tumbled from 60 billion dollars in 2014 to 27.5 billion in 2016, and the foreign exchange reserves fell from 193 billion dollars in 2013 to 105 billion in 2017 and then to 50 billion in 2019, this what caused the current account deficit by 27 billion dollars in 2015, 21 billion in 2017 and 15 billion in 2018, and this what promoted the Algerian Central Bank to issue 6555 billion dinars equivalent to 544 million dollars to stimulate the economy and bridge the budget deficit in 2017 and 2018, all of this changes was reflected in the social life with the increase of unemployment rate from 9% in 2013 to 12% in 2017 and the poverty rates from 9.2% in 2013 to 11% in 2018 because the austerity policy that the government has pursued since 2016 by decreasing the government spending and the suspension of many investment projects in addition to the high tax rates. **(hicham, 2020, p. 30)**

according to the IMF. Although the non-hydrocarbons sector – which accounted for about 77% of GDP in 2017 – accelerated modestly from growth of 2.3% in 2016 to 2.6% in 2017, this was swamped by a dramatic swing in the hydrocarbons sector, which contracted by 3% in 2017 after a 7.7% gain in 2016. According to the National Statistics Office, yearon-year (y-o-y) growth continued to weaken in the second quarter of 2018, with real GDP expanding by 0.7% compared to 1.5%. The performance of the hydrocarbons sector dulled significantly, contracting by 8.2%, while non-hydrocarbons activity grew by 2.8%. The latter was led by the agriculture sector, which expanded y-o-y from

0.7% to 8.9%, although it was somewhat muted by the industrial sector, which moderated from growth of 4.4% to 2.1%. The continued recovery of oil prices in 2018 should help the hydrocarbons sector regain lost ground, while supportive monetary and fiscal policies should see the rest of the economy gain momentum through to the end of 2018 and into early 2019. In its latest World Economic Outlook, published in October 2018, the IMF forecast real GDP growth to increase to 2.5% in 2018 and 2.7% in 2019, before trending lower each subsequent year to a growth rate of less than 1% by 2022 as efforts to correct public finances weigh increasingly on demand. The impact of fiscal policies is expected to be channelled largely through the non-hydrocarbons sector, with greater flexibility in public expenditure to drive a 3.4% expansion of the sector in 2018, which would be its fastest growth in three years, before declining to 2.9% in 2019, 1.8% in 2020 and less than half that rate in the following years, according to the IMF's 2018 Article IV Consultation for Algeria.

4. THE ECONOMETRIC STUDY OF THE IMPACT OF FLUCTUATIONS IN ALGERIAN DINAR EXCHANGE RATEEXCHANGE RATEON SOME MACRO-ECONOMIC VARIABLES

4.1 PracticalApproach: (Empirical Analysis):

The economic approaches cannot be accurate and accepted if they could not be quantitatively approved so the econometrics has been found to facilitate their assay and examination, also the model should significantly explain the relationship between the studied economic variables, due to that, an econometric study will be applied on a set of economic variables and the nature of their influence on the Algerian **(NER)** using Estimation of the simple regression model ,by Ordinary Least Squares Method cointegration to know if there is a relationship between variables.

4.2 Definition The Methodology Of The Normal Ordinary Least Squares (OLS):

The method of ordinary micro-squares is used to estimate long-term relationships, taking into account shortly (run dynamics) as it includes time delays for variables, like most other standard methods, despite their developments, consists of an OLS application with some modifications.

This methodology addresses:

1. The endogeneity problem between most time series, such as price variables in the dial function, may lead to a self-correlation (serial correlation).
2. The characteristic of the non-silence of time series, instrument variable)where they are eliminated through the use of instrument variable, and the application of the micro-square method to statistically static time series. **(Al-Sawai, 2011).**

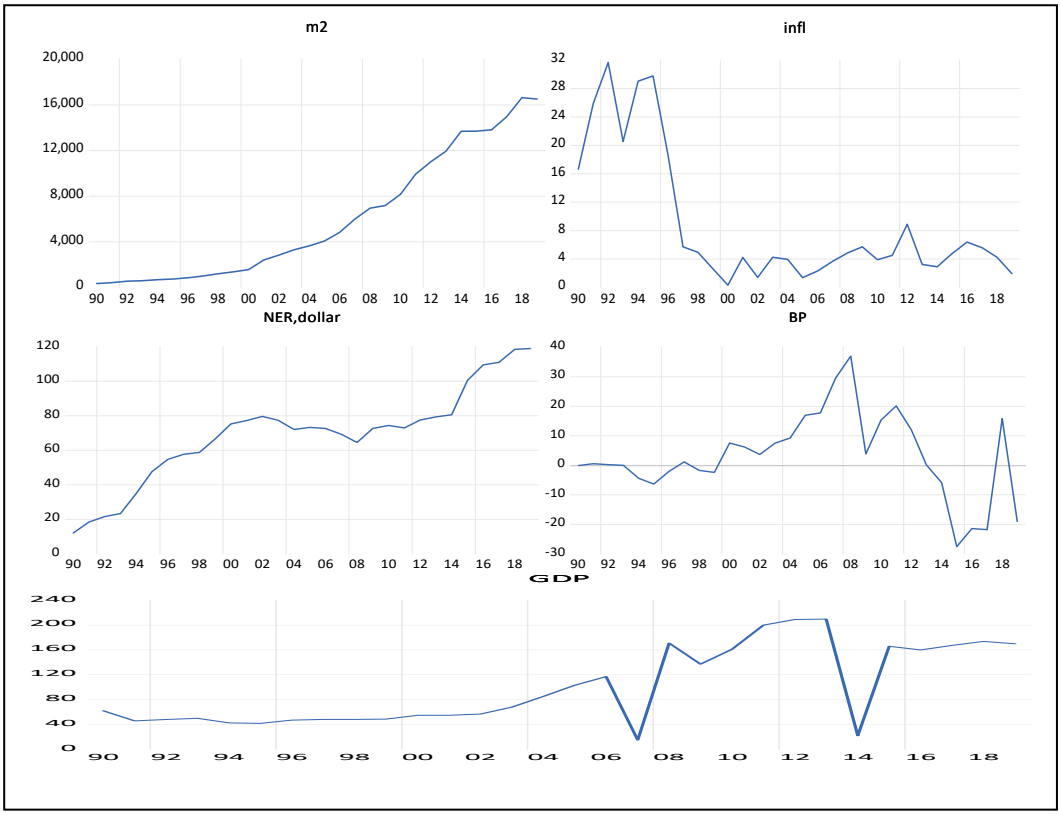
4.3 The Mathematical Formulation Of The Model:

we will try through this standard economic study to develop a model of foreign exchange reserves by adopting the following independent variables: the exchange rate of the Algerian dinar against the Us dollar and symbolized by **(NER),** in addition to the development of the)monetary mass illustrated by **(M2),**the variable dependent is the inflation, which is symbolized by (**INF**),Economic growth rate **(GDP),** and Balance of payments**(BP)**, the study data were obtained from the World Bank (www.worldbank.org) and Bank of Algeria Report - Statistical Bulletins –

from which the model can be formulated as follows:

NER = F(INF,M2, GDP, BP)……(1)

Fig.1. Graph of eveiwse outputs for the evolution of study variables (NER-INF-GDP-BP -M2) for the period 1990-2019



Source: Prepared by researchers based on **eviews 11** outputs.

The **(OLS)**model rating, which is the best from the point of view of economic, statistical and standard measures, showed that it is based on the principle of minimizing the total error boxes at a significance level of (**5%),** using **Eviews 11** results.

Table.1.Results Of The Model Estimation In The Normal Ordinary Least Squares (OLS)

Dependent Variable: NER_DOLLAR
Method: Least Squares
Date: 01/12/21 Time: 18:12
Sample: 1990 2019
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	66.96223	5.902003	11.34568	0.0000
M2	0.002816	0.000715	3.936806	0.0006

INFL	-1.459226	0.289059	-5.048191	0.0000
GDP	-0.010854	0.056000	-0.193827	0.8479
BP	-0.295727	0.177747	-1.663752	0.1086

R-squared	0.838162	Mean dependent var	69.10967
Adjusted R-squared	0.812268	S.D. dependent var	27.68429
S.E. of regression	11.99505	Akaike info criterion	7.957877
Sum squared resid	3597.029	Schwarz criterion	8.191410
Log likelihood	-114.3681	Hannan-Quinn criter.	8.032586
F-statistic	32.36898	Durbin-Watson stat	0.815805
Prob(F-statistic)	0.000000		

Source: Prepared by researchers based on **eviews 11** outputs.

Estimate Equationm: **NER=0.002816* M2 +(-1.459226)*INF+(-0.010854)*GDP+(-0.295727)*BP**

4.4Statistical Study Of The Model

a. Selection factor: Estimatedat **(0.838162)**or **(83.81%)**and corrected selection coefficient estimated at **(0.812268) or (81.22%).**

b. Significance Test:

- The model's significance test as a whole: the test is based on the Fisher test where the value is compared to the scheduled, where at a significance level of **(0.05)** the calculated value **(32.36898)** is greater than the table value of **(3.88),** thus accepting the alternative hypothesis and model suitable to represent the relationship between the dependent variable and the independent variables.
- Parameters significance Test: This is done by testing the calculated value with the scheduled value, where the alternative hypothesis is accepted if the calculated value is greater than the table value, and through the results the calculated value of the monetary mass variable **(3.936806)**and **(-5.048191)**for inflation**,**is greater than the table value **(2.160)** at **30** views and a**(5%)** significance level , which means that the allowance hypothesis is accepted with an effect of the monetary mass on the dependent variable.

c. Problem-free model test:

- **Contrast instability problem:**One of the hypotheses of the test models is the variability to the error point, by doing the Breusch-Pagan-Godfrey test

Breusch-Pagan-Godfrey**Table.2**.Test Results

Heteroskedasticity Test: Breusch-Pagan-Godfrey
Null hypothesis: Homoskedasticity

F-statistic	1.020756	Prob. F(4,25)	0.4158
Obs*R-squared	4.211759	Prob. Chi-Square(4)	0.3781
Scaled explained SS	3.995025	Prob. Chi-Square(4)	0.4067

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/12/21 Time: 18:54
Sample: 1990 2019
Included observations: 30

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	105.0593	99.03421	1.060838	0.2989
M2	0.012677	0.012003	1.056139	0.3010
INFL	6.517627	4.850345	1.343745	0.1911
GDP	-1.201853	0.939664	-1.279025	0.2126
BP	0.184427	2.982550	0.061835	0.9512

R-squared	0.140392	Mean dependent var	119.9010
Adjusted R-squared	0.002855	S.D. dependent var	201.5620
S.E. of regression	201.2741	Akaike info criterion	13.59822
Sum squared resid	1012781.	Schwarz criterion	13.83176
Log likelihood	-198.9734	Hannan-Quinn criter.	13.67293
F-statistic	1.020756	Durbin-Watson stat	1.511090
Prob(F-statistic)	0.415778		

Source: Prepared by researchers based on **eviews 11** outputs.

The statistical value**X2= R2*N,** or**X2=0.140392*30 =4.2117**, with a probability of **P=0.3781**and of which the calculated value is greater than the table value of the Chi-square distribution with a degree of freedom of **(1)**, significance level **(1%)** and **(5%)** which is close to the calculated value and from there we

reject the null hypothesis**H0**, from which we conclude that the difference of errors is heterogeneous, and therefore statistically acceptable.

- **The problem of self-association:**It is one of the most important criteria used to detect the extent of self-association, and the rank is higher than one, from which it is the limit of tests used to detect the extent of self-association between the slope equation protectors presented by Breusch-Godfrey under the name Serial LM Correlation Test.

Table.3. Breusch-Godfrey Serial Correlation LM Test Results

Breusch-Godfrey Serial Correlation LM Test:
Null hypothesis: No serial correlation at up to 2 lags

F-statistic	3.772760	Prob. F(2,23)	0.0383
Obs*R-squared	7.410762	Prob. Chi-Square(2)	0.0246

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 01/12/21 Time: 18:46
Sample: 1990 2019
Included observations: 30
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-2.787353	5.928206	-0.470185	0.6427
M2	0.000237	0.000658	0.360713	0.7216
INFL	0.210058	0.309090	0.679602	0.5035
GDP	-0.005621	0.051448	-0.109262	0.9139
BP	0.024482	0.165103	0.148282	0.8834
RESID(-1)	0.557659	0.207254	2.690705	0.0131
RESID(-2)	-0.101940	0.257184	-0.396370	0.6955

R-squared	0.247025	Mean dependent var	1.20E-14
Adjusted R-squared	0.050597	S.D. dependent var	11.13712
S.E. of regression	10.85171	Akaike info criterion	7.807486
Sum squared resid	2708.472	Schwarz criterion	8.134432
Log likelihood	-110.1123	Hannan-Quinn criter.	7.912079
F-statistic	1.257587	Durbin-Watson stat	1.532903

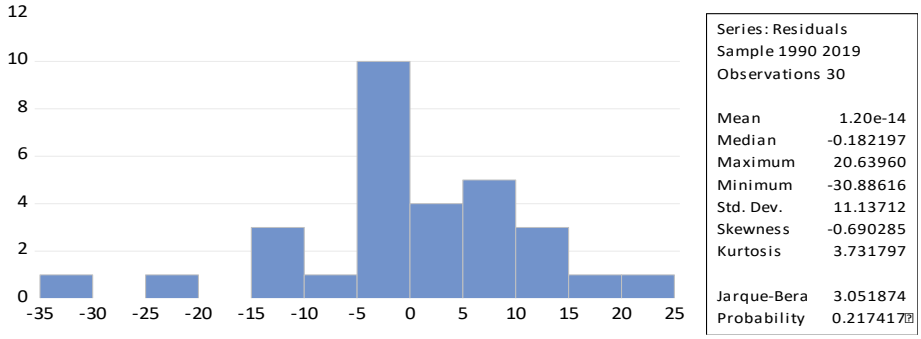
Prob(F-statistic)	0.314920

Source: Prepared by researchers based on **eviews 11** outputs

The result obtained means accepting the non-imposition and rejecting the alternative because the calculated **Obs*R-squared statistic = 7.410762**is close to the scheduled value that has a **Chi-square= 3.84**, and from which to accept a self-correlation between variables.

- **The Problem Of Non-Normal Distribution (Natural Distribution Verification Test For Modified Regression Protectors: Jarque-Bera):** Concerning verifying the natural distribution of the slope equation with Jarque-Bera, the non-existent hypothesis that the slope equation protector is naturally distributed from the statistics of this test can be rejected, and we reject the imposition of zero if the JB statistical value is greater than the scheduling value of the Kay square distribution and vice versa.

Fig.2.Jarque-Bera test results



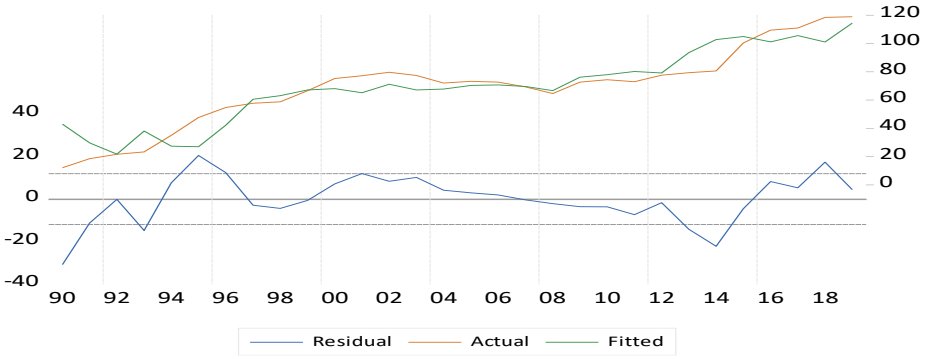
Source: Prepared by researchers based on **eviews 11** outputs.

Since the value of **Jarque-Bera= 3.0518**is less than the scheduling value of the distribution of the Kay box at a moral level **(1%,%5%,،10%)** and a free score of **(1),(10.83, 7.88, 6.63)** from which the basic hypothesis that the condoms are naturally distributed can be accepted.

c. Compare Actual Data And Model Estimated Values

The figure shows the comparison between actual data and the estimated values of the model as follows:

Fig.3. Curve of actual and estimated model values during the period (1990-2019)



Source: Prepared by researchers based on **eviews 11** outputs

The figure above is a match between the actual value curve and the estimated value curve, i.e. the chosen model is identical to the economic reality and is economically and statistically acceptable.

4. CONCLUSION*:*

Algeria needs to adjust to the low oil price realities. Without sustained policy adjustment, a protracted period of low hydrocarbon prices could set the country on an unsustainable trajectory of macroeconomic imbalances. The heavy reliance on hydrocarbons poses structural risks to Algeria's economy, and both monetary and fiscal policies face important challenges to respond to the ongoing oil price shock and preserve a positive outlook for growth, inflation and international reserves.

- **Results :**

  This studyconcludedthattherewas :

  - direct relationshipbetween the monetarysupply and exchange rate, and economicgrowth rate (GDP).

- and there's an inverse relationshipbetween the exchange rate and inflation, information.
- Thisstudyneeds to activatemonetary and financialreform by pursuesound and effective financial and monetarypolicies, that will reduce the size of internal and external imbalances, which contribute to the stability of the exchange rate and enhance confidence in the national economy in general.

- **Suggestions:**
  - Well-managed exchange rate flexibility can help the economy better adjust to the low oil price environment. Given the shallow and imperfect exchange market, the central bank should “lead” the market towards a path of exchange rate adjustment consistent with a medium-term internal and external equilibrium. However, exchange rate adjustment cannot substitute for fiscal and monetary policy adjustment.
  - In addition, these need to be complemented by a structural reform strategy that aims at diversifying exports and replacing imports with domestic production to help preserve growth.
  - All inflationary worlds such as monetary and structural factors must be controlled.
  - Increasing the growth rate of exports outside hydrocarbons.

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