The Impact Of Exchange Rate On Inflation And Economic Growth in Algeria – Econometric Study –

أثر سعر الصرف على التضخم والنمو الاقتصادي في الجزائر- دراسة قياسية-

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Abstract: This paper examined the impact of the exchange rate on inflation and economic growth in Algeria, during the period (1980-2012). Where use error correction model (ECM) to know the balance of a long term relationship between the variables, showed the results of statistical tests, that the variables of the study is not stable at the level, but stabilized after taking the first difference, and the integration of the first class, which indicates the possibility of using ordinary least squares to estimate the relationship between variables as the Granger causality test and the causal relationship between the variables results showed that every relationship in one direction.

Keywords: Exchange rate, inflation, economic growth and monetary supply.

ملخص: بحثت هذه الورقة اثر سعر الصرف على التضخم والنمو الاقتصادي في الجزائر، خلال الفترة ما بين (1980-2012). حيث تم استخدام نموذج تصحيح الخطأ (ECM) لمعرفة توازن العلاقة على المدى الطويل ما بين المتغيرات، وقد أظهرت نتائج الاختبارات الإحصائية، أن متغيرات الدراسة ليست مستقرة عند المستوى، ولكنها تستقر بعد أخذ الفارق الأول، ويتم تكاملها من الدرجة الأولى، وهو ما يشير إلى إمكانية استخدام طريقة المربعات الصغرى العادية لتقدير العلاقة بين المتغيرات كما ان نتائج اختبار جرانجر السببية والعلاقة السببية بين المتغيرات، اظهرت ان كل علاقة في اتجاه واحد.

الكلمات المفتاح : سعر الصرف، التضخم، النمو الاقتصادي، عرض النقود.

- Introduction :

The exchange rate is variable economically important influence as an actor , and the mediator of the effects of internal and external other, especially in front of the expanding role of foreign trade in economic development , and the evolution of the international capital markets , so it appears this price radically different in content and its significance for other economic variables , as an important barometer of the volume of transactions , in addition to the price of the main tool of exchange with a direct impact on the relationship between domestic prices and external prices , and is often the most effective tool when necessary to encourage exports and imports, providing simultaneously and directely. There is no doubt that there is a closely between the exchange rate and most economic variables , and reflect his movements - in most cases - a significant effect on inflation , as the estimation models of the exchange rate in the long run , is one of the most important concerns of many economists , that most of the macroeconomic variables unstable , such as the interest rate.

It is worth mentioning here , change prices at a high rate is not considered data nominal returns generated by the regressive impacts of the rate of inflation the fact that its impact on prices of traded securities would leave the opposite effect on those prices for two reasons , one of them directly is that the information available on the rate of inflation may carries with it the expectation of further increase in it, and the second reason concerns the indirect tax system , in periods of inflation reduced the real value of the profits of the

organization and down depending on the market value of the shares on the stock market , which is an essential component of monetary policy.

The exchange rate regime in place a key columns that define the relationship of monetary and fiscal authorities and the ability of each to influence the course of inflation. It can describe the relationship between inflation and the exchange rate regime relationship a two-way : from inflation to the exchange rate through the channel of the balance or a tie and the exchange rate to inflation over the impact of the passing of exchange rates, and concluded that the bulk of these studies indicate that countries most open commercially and economically " binding or voluntarily ' ' particularly those that adopt a market economy is facing greater impact to pass exchange rates.

In general, lead to increase the money supply , particularly through the process of issuing money to increase the rates of inflation in the country , making it relatively larger than those in countries with the largest trade association " Rest of the World " is pushing towards the lower exchange rate in the case of the exchange rate regime free- floating or lead to a re- evaluation of the value of the currency " toward reduced " in the case of fixed exchange rate regime or linked to a basket of currencies .

This indicates that the target of reducing the inflation target and maintain the value of the currency moving in the same direction and reflect the policy of a single economic tools may vary , but their goals converge at one point , especially in light fixed exchange rate system . It follows from this relationship that the extent of the effect of increasing the money supply on the exchange rate depends primarily and mainly on domestic demand for money , and also on the relative position of the exchange rate markets , which represents the demand for money and money supply in the rest of the world . In view of the foregoing , it has been divided into the following study :

The first axis: the theoretical side: concepts about the exchange rate and its regulations.

The second axis: the analytical side of the exchange rate and its relationship to macroeconomic variables.

The third axis: the practical side of the impact of exchange rate fluctuations on inflation in Algeria (1980-2012).

1- Problematic

Of the foregoing , it is clear that there is a close relation between the real exchange rate fluctuations and inflation rates 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 in Algeria , during the period (1980-2012) ?

2- The subject of the study

The study aims to shed light on the relation between exchange rates and inflation in Algeria .

3- 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 rate of inflation in Algeria ?

c - How the rate is determined by the relation between money supply and inflation rate during two periods : short- and long-term in Algeria ?

4- hypotheses

- The fluctuations in the macro-economic policy of the most important factors that contributed to the multiple exchange rates and thus instability in the long term .

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

- There is a positive relation between a statistically significant amount of the money supply , representing the size of inflation , and the increase in the exchange rate in Algeria .

5- Methodology of the study

In this study, we used a method descriptive analytical approach , and the standard statistical method through the analysis of time series, and error correction model (ECM). Use as a quantitative standard statistical approach , to try to measure the causal relation between the prevailing exchange rate and monetary inflation during the period (1980-2012).

1. The first axis: the theoretical side: concepts about the exchange rate and regulations

1- Exchange rates

The state of any country economic not being able to dispense with how to determine exchange rates, they are considered the core of economic transactions between countries, so many economists tried to explain the phenomenon of formation of exchange rates from the theoretical side especially attached to identify the concepts and definitions of its own, and by which value is determined by actual currency for another currency, is up this process by buying and selling currencies between countries.

1-1 The concept of the exchange rate

Exchange rate can be defined as "the price of the exchange of one currency for another," he knows that "the number of units of foreign currency for one unit of local currency or vice versa."

By definition the latter can be seen to the exchange rate of one angles: from the angle of the first can be seen as the exchange rate as the "number of units of the national currency, which pay a price for one unit of foreign currency," In terms of a second can be seen as many units of foreign currency pay a price for one unit of the national currency.

So the exchange rate is "***the rate at which the exchange of one country's currency, with the rest of the currencies of the world***."

And is written to the pricing of foreign currency in two ways:

- *Pricing confirmed*: as most of the countries showing the exchange rate certainly changing its quantity of foreign currency units replaced by one unit of the national currency.

- *Pricing is uncertain*: is the way the inverse of the price confirmed it refers to the quantity of the changing national monetary units that must be paid for one unit of foreign currency.

1.2 Formulas exchange rate.

There are four forms of the exchange rate , namely:

1.2.1 the nominal exchange rate :

Is a measure of the value of the currency of a country that can be exchanged currency value of another country , where currencies are exchanged or buying and selling of currencies by the prices of these currencies to each other . We can distinguish between two types of the nominal exchange rate , one official exchange rate will be based on the current exchange official , and the second is a parallel exchange rate in the parallel market rolling . And is determined by the nominal exchange rate of a currency , depending on the supply and demand sides in the exchange market in a moment of time, as can be for this price change either as a result of the change request and display it , or because the drainage system adopted in the country, and that the nominal exchange rate is the price of the currency being and who does not take the purchasing power of the currency as a criterion into account.

1.2.2 Real exchange rate[1]

expresses the real exchange rate for the number of units of foreign goods needed to buy one unit of local goods, thus it measures the ability to compete, a benefit economic operators in their decision-making. If we take the two countries, such as Algeria and the United States is the real exchange rate is:

$$TCR = \frac{TCN / Pd_Z}{1\$ / Pu_S} = \frac{TCN \,.\, Pu_S}{Pd_Z}$$

That's where:

TCR: the real exchange rate; TCN: the nominal exchange rate; PUS : price index in America; PDZ: the price index in Algeria.

It reflects the purchasing power of the dollar in Algeria, and therefore the real exchange rate of the algerian dinar versus the american Dollar reflects the difference between the purchasing power in the U.S.

And purchasing power in Algeria, and the higher the real exchange rate of the greate competitiveness of goods Algeria.

1.2.3 Effective exchange rate[2]:

Represents the index , which measures the average change in the exchange rate of the currency of a certain country for a number of other currencies in a given time , and therefore the index of the real exchange rate is equal to the average exchange rates for several currencies, which indicates the extent of improvement or development of country's currency for a group of other currencies and can be measured using a pointer to ***Laspeyres indices*** . Can be effective exchange rate that differs in terms of its value, given the possibility of a difference of several factors such as the base year, the list of currencies of the partner countries in the swap with the standards adopted in the composition of the basket of currencies, if the goal of the index is to measure the impact of exchange rate changes on export revenues , are the use of exports bilateral in determining the weights of the index , but if the goal is to measure the impact on the balance of payments will be used

imports bilateral in determining the weights, and if the goal is to measure returns exports a commodity or a number of goods to the country to the outside world are used quotas competing countries of world exports in configure the weights in the index , but for the base year shall be selected when the economy of the State concerned relative in equilibrium or very close to the equilibrium exchange rate is no equilibrium , balance sustainable balance of payments when the economy is growing at a normal rate .

2. The second axis: the analytical side of the exchange rate and its relation to macroeconomic variables[3]

we can not study the exchange rate without knowing the relation between it and the most important variables that go into inexplicable , as the relative stability in the currency of the country has a direct effect on the activity of the stock market. So that the exchange rate is one of the important economic indicators that affect the economic stability of the public and then the performance of the stock market. The global financial markets are witnessing a significant increase in inflows of foreign capital to invest in their financial portfolios . The impact of these flows on currency exchange rates , it is also affected by fluctuations in these currencies . This on the one hand and on the other hand is considered the moves and fluctuations in exchange rates affect poses directly in exports and imports , inflation and fiscal and monetary policy and GDP through this research stand at the nature of the relation between the dependent variable to be studied and the most important independent variables and interpreted for it.

1- Money Supply

Economists unanimously that the money supply can be classified into three main types , the money supply , as the MS1 symbolizes the money supply in the narrow sense , while the money supply in the broad sense and is symbolized by the symbol MS2. The money supply in the broadest sense or broader and has the symbol MS3.

A - Money supply in the narrow sense :

Controls the money supply in the narrow sense parties are commercial banks operating in the country and the Central Bank , which has the power to issue currency , and this kind of supply includes currency in circulation outside the commercial banks added to demand deposits (which is what the current known deposits) . If the expression of currency in circulation and deposits outside the commercial banks , it can be expressed in money supply symbol CS and demand deposits are indicated by CD , it can be expressed in money supply in the narrow sense that it is : MS1 = CS + CD.

B - the money supply in the broad sense :

It includes currency in circulation outside banks operating in the country in addition to demand deposits and time deposits , which are not under any application that includes all deposits known as (the most popular phrasal money) in addition to the money supply in the narrow sense . And there was the expression of semiconductor Money symbol , the DM can be expressed in broad money supply in the form of the following equation : MS2 = DM + MS1.

C - the money supply in the broadest sense :

This is the kind of money is used in a small number of developed countries because of the evolution of financial markets and the emergence of him from financial institutions and intermediary between commercial banks and the Central Bank which resulting in the emergence of forms of deposits that need longer periods of time than those classified under demand or that are not longer than two years at the latest , and this type of banking institutions include banks dealing with leaves of securities such as the sale and purchase of securities , which play often institutions such as banks, savings and loan , which can be classified as money supply in the broadest sense as the difference in the duration and type deposits that can be calculated in money supply item in the broad sense or not.

2- Exchange rate and monetary and fiscal policy

The rise in the money supply in a country affects determine the exchange rate, through the high level of prices of domestic goods and services, which result in increased costs of exports, making them unable to compete with their counterparts in other countries, thus fall in demand due to demand residents to buy from abroad, it which helps to reduce the local currency. As a result of increased demand for foreign currency , as the interest rate that the relationship between the exchange rate established the relation between fiscal policy and the value of the currency abroad , when the central bank to install The real money supply , the expansionary fiscal policy will lead to increased government spending , in other words will lead to an increase in real income and the interest rate is what leads to increased foreign demand for bonds, thus increasing the value of the currency of the country . One of the most important channels that determine the course of inflation , especially in emerging countries is the relationship between the monetary authority and financial power in the country . Financial authority can influence the course of inflation through policies of fiscal deficits and government spending policies , especially in the long term . As for the short and medium term , plays a style of monetary policy and institutional organization , which operates through a central role in the mechanisms of determining the general price level . May seem to us the degree of interdependence between monetary policy and inflation is weak in the short term , but that is considered normal in light of the availability of other sources of funding non- inflationary . With a foggy responsibilities and objectives , may be affected by fiscal policy " specifically associated with a deficit constant " style of work and credibility of monetary policy and institutional frameworks . An example of this process is opposed to the objectives and the modus operandi of fixed exchange rate system " especially linked to the Council of the coin " with fiscal policies resulting from the existence of a financial deficit continuous or those associated with the so-called inflation tax . This has contributed to various exchange rate policies and monetary policies related to the reduction of inflationary pressures around the world in the nineties . The logical argument leads us to wonder : Why do the authorities take economic policies and decisions known in advance that it will lead to inflation? And why the phenomenon of inflation continue to emerge from time to time and are sometimes might seem surprising ? Attributed the answer to two main reasons : first the behavior of financial power represented by the need to finance the fiscal deficit accumulated through the use of influence to printing more money , and secondly to the behavior of the monetary authority represented in the disruption of the timing of monetary policy appropriate and instability over time «Time inconsistency».

3- Exchange rate and inflation[4]

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.

4- Exchange rate and economic growth[5]

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 can not 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.

3. Axis III study Applied: appreciation, analysis and interpretation of results

This paper will be in the use of time-series methods, and test the stillness, and the method of co-integration.

3.1 The model used:

The study on one country, namely: Algeria, during the period under study (1980-2012), and therefore, this study used a test method using co-integration *Angel Granger,* to test the effect of the exchange rate on inflation in Algeria, it was necessary to insert some other variables affecting inflation, and takes the overall model used in this study as follows:

$$inf = (GDP, ER, M2, u_t)$$

$$INF_t = \beta_0 + \beta_1 GDP_t + \beta_2 ER_t + \beta_3 M2_t + u_t$$

That's where **;**

t : *Represents* time *(1980 -2012).*

GDP_t : The annual growth rate in per capita real GDP, a representative index of economic growth.

ER_t : Rate of real effective exchange rate.

$M2_t$: The rate of money supply in its broadest sense.

u_t : Residuals estimating equation.

3.2 Results of the estimation :

a- Test results stillness time series:

The study of stability, one of the conditions important when studying the integration synchronous because its absence causes several problems with the standard, and the importance lies in the verification of the stability or instability of the time series and know the quality of instability if the type The unit root and longer tests root of unity, Differency Stationary) (DS) will conduct tests of stability, and we are in this process in order to avoid regression false and misleading results, and you should be time-series stable of the same class, and is this one of the necessary conditions for testing co-integration otherwise there will be no relation between the variables in the long term.

There are several methods that are used in the test stillness time series are either how or amount :

1 - Qualitative tests

Including the chart , which may not give conclusive results on the nature and characteristics of the time series , as can be inferred stillness time series for any variable where nearing function test Auto Corrélation Function "ACF of one if the string is not static, and decreases gradually with increasing the time gap , the method is based on the theoretical examination , but may not lead to conclusive results .

2 - Tests Quantity:

It is more accurate in determining the stability, time series , and the most important of these tests , we find : test Dickey-Fuller, (Dickey Fuller Augmented "ADF). Philips Perron" (PP).

Where these tests demonstrate the nature and characteristics of the time series of the variables under study, and these tests can be addressed as follows:

The following table stillness test results for all study variables. Terms following table shows the test results for all stillness variables of the study, by applying the Dickey Fuller test (adf) and Phillips Peron (pp) to the time series.

Table (01): Results (Unit Root Test) for the variables of the study

variables	ADF		pp	
	level	**First deference**	**level**	**First deference**
Er	0.80	-2.887	0.9815	**-2.743**
Infla	-1.145	-4.988	-1.2073	**-5.008**
Gdp_g	-3.033	-5.837	-2.258	**-7.953**
M2	-1.923	-7.932	-1.623	**-18.880**

* Significant at the 1% level (-2.63). , ** Significant at the 5% level (-1.95)., *** Significant at the 10% level (-1.61).

Where it is clear from Table (01) that all the variables of the study is still in level while all the variables have reached the stage of table stillness and stability at the level of significance 1% and 5% and 10%, after taking the first difference to it, We conclude from this thatTime series are integrated first-class CI ~ (1).

b- the test results using the method of co-integration (Engle-Granger) :

The method of Angel and Granger used to test the co-integration in the regression models Statistics containing two variables only and where the number of time-series data is great, is this method estimates the model simple linear relationship between the dependent variable and the independent variable , and then not get residuals resulting from the appreciation of this relation and the test If you have a unit root was a series residuum static level, this indicates the existence of a joint integration of the same rank time series , and therefore there is the possibility of a joint integration between these chains , which ensures the existence and long-term relation between them.

so we will test Angel - Aqranger to prove or disprove it.

- Determination of the relationship in the long run gave the following results:

b.1 Model function of inflation in the long term :

We will examine the impact of the change in the exchange rate on the inflation rate in Algeria, and can be written in standard form a standard function, and thus the equation as follows:

$$inf = B0 + \beta 1 gdp + B2\ ER + B3M2 + u_{it}$$

That's where :

inf : The rate of inflation.

gdp : Rate of per capita real GDP.

ER : the rate of real effective exchange rate.

$M2$: the rate of money supply in its broadest sense.

u_t : residuals estimate a function of inflation.

$B0, B1, B2, B3$: model parameters.

- estimationtion of the model : using EVIEWS get an estimate of the inflation model function:

$$inf = 12.029 - 1.206 gdp - 0.067\ ER + 0.089 M2 + u_{it}$$

Table (02): Results of the estimation model function of inflation in the long term

Variable	coefficient	S.E	t-statistics	P.value
Constant	12.02969	3.688363	3.261527	**0.0028**
gdpg	-1.206732	0.656336	-1.838588	**0.0762**
ER	-0.067537	0.053357	-1.265739	**0.2157**
M2	0.089044	0.169404	0.525631	**0.6031**
(R^2=0.26 , Adj R^2= 0.19 , dw=0.71)				

Source: Preparation researchers using the program (Eviews 7)

We tested the integration of common leftover from the previous estimate, and by applying the Dickey Fuller test (adf) and Phillips Peron (pp) on the residuum.

Dickey Fuller test results on a series Residuals are shown in the following table :

Table (03): Results of co-integration test Angel and Granger :

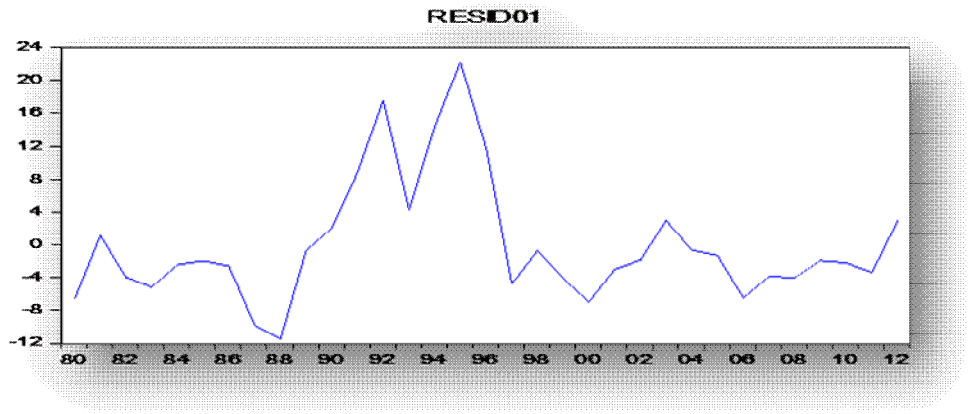
Residuals series	ADF	pp	Unit root test	Decision
resid01	**-2.699**	**-2.713**	**CI~(0)**	**Rejection**

* Significant at the level of 1% (-2.63). , ** Significant at the 5% level (-1.95).,
*** Significant at the 10% level (-1.61).

Source: Preparation researchers using the program (Eviews 7)

From Table (03) we note that all series residuals resulting from the estimation models study the standard in image Mini was still in the level, evidenced by rejecting the null hypothesis, which provides for the existence of the root of the time series and the conclusion that the residuum integrated class zero CI ~ (0) and this means that there is a common integration of the same class for the study variables in each model. Note the form of a series of residuals:

Figure (01): a series residuals :



Source: Preparation researchers using the program (Eviews 7)

Model function of inflation in the short term (ECM Estimation):

After making sure of the time-series variables model study, it is still in the level and static in the first difference , and then check they are all integrated integrated joint , it is clear that there is a relation Twaznip long -term relation between the study variables , and therefore that integrate common and reflect the relation of the balance of long-term, and it should be given representation error correction model (ECM), which has the potential to test and assess the relation in the short and long term between the variables of the model , it also avoids the problems standard resulting from the link false . (Spurious correlation) and to estimate the error correction model we use the method of Angel and Granger as follows :

Phase I: Estimation of the relation in the long term and calculate residuals:

- Relationship in the long term

$$inf = 12.029 - 1.206gdp - 0.067\,ER + 0.089M2 + u_{it}$$
$$R^2 = 0.26 \qquad DW = 0.71 \qquad n = 32$$

- *Residuals e_t:*

$$e_t = inf - 12.029 + 1.206gdp + 0.067ER - 0.089M2$$

Phase II: estimating the relation in the short term:

The relation in the short term:

$$\Delta inf = -0.8663 - 0.017\Delta gdp + 0.3606\Delta er + 0.071\Delta m2 - 0.40e_{t-1}$$

$$t \quad (-0.90) \quad (-0.04) \quad (1.68) \quad (0.95) \quad (-3.27)$$

$$R^2 = 0.32 \quad DW = 1.34 \quad n = 32$$

Table (04): Results of the estimation error correction model (ECM)

Variable	coefficient	S.E	t-statistics	P.value
Constant	-0.866356	0.961595	-0.900957	0.3756
Δ gdpg	-0.017271	0.355797	-0.048541	0.9616
Δ ER	0.360607	0.213904	1.685831	0.1034
Δ M2	0.071303	0.074761	0.953746	0.3487
resid01(-1)	-0.405120	0.123583	-3.278117	0.0029
(R^2=0.32 , Adj R^2= 0.22 , dw=1.34, Prob=0.0252)				

Source: Preparation researchers using the program (Eviews 7)

***Evaluation short-term model (model error correction):**

Form a short-term note the following:

Coefficient (e ($_{t-1}$)) is negative and significant at the level of significance (α = 5%), thus model is correct the error is Acceptable. By the results of the model it is clear that an integrated chains in the long term.

Economic interpretation of the results of the model :

- Negative sign for the coefficient of residuals and their significate, that explains the return strongly towards equilibrium.

- Accept economically negative sign for the coefficient of GDP and the inflation rate, albeit not significant, which means that the increase in GDP by 1% leads to lower inflation by 0.017%

Also accept signal positive for the real exchange rate , although it was not significant , since when increasing the real exchange rate of 1% leads to increased inflation to 0.36% , the rise in the exchange rate leads to lower spending on consumption and local investment so the domestic production decreases with remains high local demand and as a result produces a high price level , which means that there is a relationship between the affected and the impact of the exchange rate and the general level of prices.

Economically as well as accept the positive signal for the money supply , albeit not significant , as it increased the money supply at 1 % leads to increased inflation by 0.071 % , and this is consistent with the views of the monetarist school which confirms that the increase in the money supply lead to increased rates of inflation , which means that inflation is a monetary problem purely by their opinion .

- Is clear to us from the error correction coefficient (-0.40) , when it deviates inf in the short-term period (t-1) for the equilibrium value in the long term , it is corrected equivalent to 40% of the deviation in the period (t) .

- The value of the coefficient of determination R^2 is 0.32 , reaching a value acceptable in the case of test error correction , the independent variables explained 32% , and the rest is due to other variables not included in this model , which have the most influence in the rate of inflation.

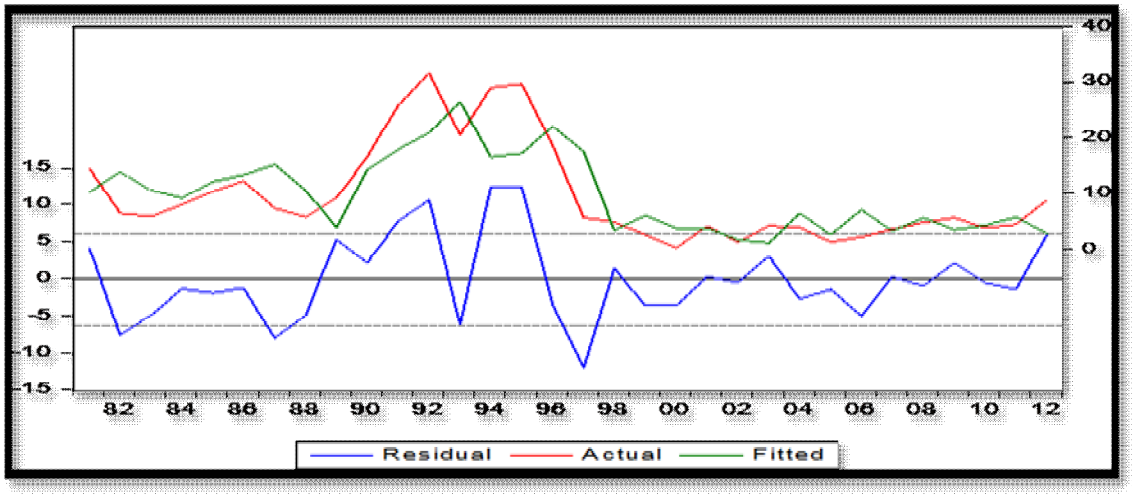
- Show statistically (Dw), the presence of non-packets of a problem autocorrelation between the independent variables, as occurred in the value of the uncertainty, and since our goal of the study is not for the purposes of predictive'll take these results.

- The value of a statistical Fisher (F), at a value of 6.29, and thus form a good and moral entirely.

- To ensure the absence of error correction model of the standard problems, it has been used several tests and it was found that the model has exceeded all statistics examination of residuals, such as:

- Compared to the values of truth values estimated using the model through the following diagram:

Figure (02): the values of truth and estimated values and leftover model



Source: Preparation researchers using the program (Eviews 7)

- Note through Figure (02) the convergence of the estimated values of the real values which indicates the quality of the estimated model, so it can be relied upon to interpret and analyze the results.

- Error correction model does not have the problem of linear correlation to the lack of correlations with high values of the independent variables in the model, as shown in the table Matrix correlations below:

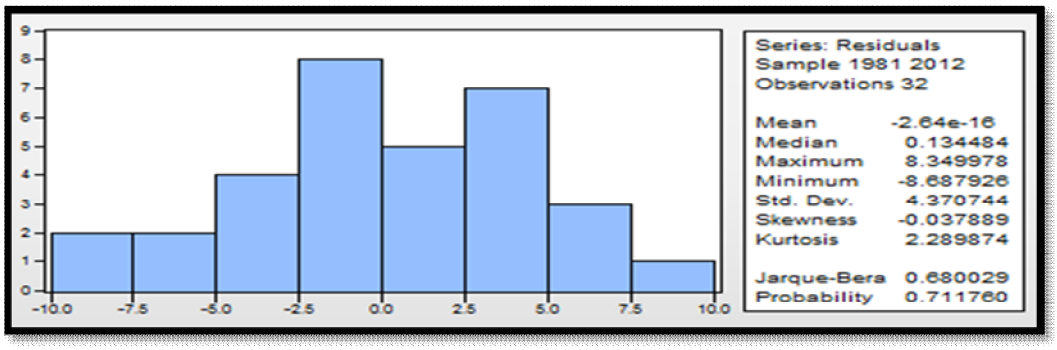
Table (05): Matrix correlations to the variables of the form of short-term

	DIFLA	DGDP	DER	DM2
DIFLA	**1**	**0.1631**	**0.0867**	**0.2002**
DGDP	**0.1631**	**1**	**0.1977**	**0.1592**
DER	**0.0867**	**0.1977**	**1**	**0.0325**
DM2	0.2002	0.1592	0.0325	1

Source: Preparation researchers using the program (Eviews 7)

- Check the condition *NORMAL* distribution of residuals using (Jarque-Bera): found that the test result was not significant, and this supports the validity of the imposition of follow residuals form a *NORMAL* distribution, and through value JB = 0.68 less than ($5.99=X^2_{0.95}$) and the diagram below illustrates this:

Figure (03): NORMAL distribution of residuals to model the short-term



Source: Preparation researchers using the program (Eviews 7)

It should be noted here with the requirement of independence of the independent variables from each other so that no problem occurs duplex linear, and which have a negative impact on the results of the assessment, and to check out the futility of this problem, we have extracted the value of the inflation factor variation (VIF) which usually refers to a value of less than 10 for this parameter on the lack of the negative impact of this problem on the form in the sense approximate model free of the problem, The following table shows that

Table (06) shows the results of the verification of the absence of double-linear problem :

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
DGDP	0.126591	1.133903	1.131518
DEXCH	0.045755	1.613769	1.259691
DM2	0.005589	1.029194	1.028587
RESID01(-1)	0.015273	1.242035	1.241841
C	0.924666	1.349044	NA

Source: Preparation researchers using the program (Eviews 7)

Note through the table (06) that the value of inflation variability (VIF) for all variables is less than the value of 10 and thus reflects a lack of negative impact to the problem of duplication of linear and thus rely on the results of the model estimated.

- The value D.W tells us that the model is located in the region unresolved, which does not settle the problem of the existence of autocorrelation, where the value D.W =1.30 of the number 32 watch for three explanatory variables. In order to make sure that this problem exists, will be used to test LM the autocorrelation, as shown in the table:

Table (07): Test LM and Test ARCH of the short-term model (model error correction)

	Obs*R-squared	Probability
Breussch- Godfrey Serial Correlation LM Test	4.8712	0.0875
ARCH Test	0.194577	0.6591

Source: Preparation researchers using the program (Eviews 7)

Based on Table (07) :

To test the problem of serial correlation, use the test LM, so that LM = n X R^2 : 28X0.16=4.489, where n: represents the number of views used in the model, and compared

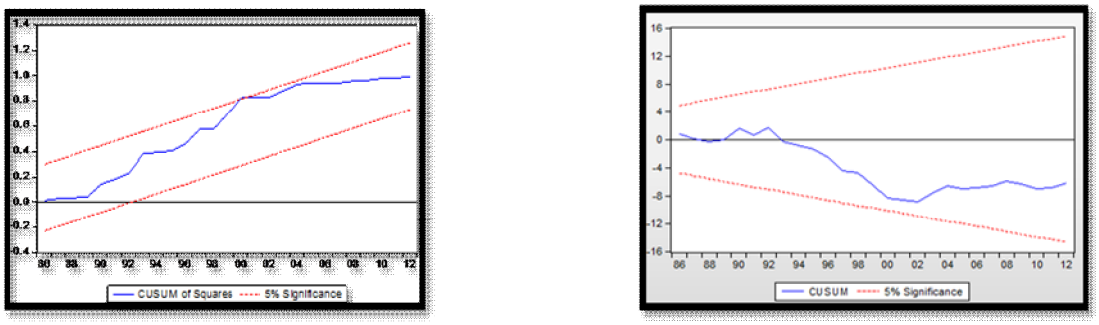
statistic X^2_K tabular degree of freedom K = 2 and the level of significance of 5%, and equal to 5.99 and we have: 5.99 <4.8712, and therefore accept the null hypothesis that the model is free from the problem of autocorrelation.

- With regard to the stability of the contrast or not (Heteroscedasticity) can be used where ARCH test aims to find out if there was a correlation between the boxes Residuals It is based on a multiplier Lagrange LM = n X R^2 = 27X0.0072 = 0.194, and comparable statistic X^2_K tabular degree of freedom K = 1 and the level of significance of 5%, equal to 3.84 and from our:

3.84 > 0.049, therefore accept the null hypothesis which is the stability of the contrast reduce error.

To test the stability of the model was tested using the cumulative sum of squares (CUSUM) and (CUSUM of Squares) turns out that the model is characterized by periods of stability in most of the study with the exception of 2000 and 2001 as shown in the form of the test shown in Figure below:

Figure (04): testing the stability of a



Source: Preparation researchers using Eviews 7

-Summary :

The exchange rate is variable economically highly sensitive to internal and external stimuli , especially in front of the breadth

The role of foreign trade in economic development , and the evolution of the international capital markets , so this shows a different price difference

Radically in its content and its significance for other economic variables , as a link between international economics , This study aimed to assess the relation between the exchange rate and inflation in Algeria during the period (1980-2012) using standard techniques in the analysis of modern co-integration and error correction models , and found the following results:

The exchange rate is influenced by several economic factors as a show of money, interest rates, inflation rates and the state of the balance Payments and the state budget, and there are non-economic factors such as lack of political stability and rumors.

-Resulted in the drainage system used in Algeria and policies to create a parallel market exchange.

- The study showed the presence of a clear impact of the exchange rate on inflation in Algeria .

- To test stability of the time series used in the study , noted that it is not stable in the first level and stable in the first difference .

- Co-integration test between (the exchange rate and inflation) in Algeria showed the existence of a long-term equilibrium relationship between them according to the co-integration test and Angel and Granger method.

- Model tests indicated that the error correction coefficient end error correction signal carries a negative and significant as the deviation of the actual exchange rate on the balance corrects each year by an amount (40%) .

- The main cause of inflation in Algeria is to change the exchange rate of the dinar Algerian but it is not the only factor , but there are many other factors that affect the exchange rate and thus inflation.

-There is a direct correlation, directly between the equilibrium exchange rate long-term, the general level of prices, which the only variable that causes the high exchange rate of the Algerian dinar.

We conclude our research with some recommendations:

- Must prevent big moves in the exchange rate does not occur until a major impact on foreign trade and the local inflation in developing countries.

- Must control the general level of prices as the main factor and the most influential on exchange rates.

The need to control the monetary indicators and diversify the sources of access to international liquidity so as not to be affected by prices Exchange negatively.

References

1-References foreign language

-Abdelmadjid Bouzid: "Les années 90 de l'économie Algérienne", édition ENAG. 1999.

BENASSY. A, " comment se fixent les Taux de changes : un bilan " economie et prévision . (1993).

-Bernardin Akitoby ," Régidité nominale, dévaluation et équilibre général intertemporel"Cahier 0897,Centre de recherche et développement en économique (C.R.D.E.) et Département de sciences économiques, Université de Montréal - Juin 1997 –

-Gregoir stephane et Maurel française, " Les indices de compétitivité des pays: interprétation et limites", INSEE, Octobre 2002.

-Innwon Park, "Trade Liberalization and Long-run Economic Growth - A CGE Model Analysis of AFTA",Graduate School of International Studies, Korea University, 2003

-Roger Percerou:"Entreprise,gestion et competitivite",economica,1984.

- Rudiger Dornbusch (1988), "Exchange rates and inflation", MIT Press, Cambridge, Mass.

-L. Lachaal, « La compétitivité : Concepts, définitions et applications », Institut National dela Recherche Agronomique de Tunis (INRAT),2000.

2- المراجع باللغة العربية

- أحمد فريد مصطفى، **الاقتصاد النقدي و المصرفي**، مؤسسة شباب الجامعة ، الإسكندرية،مصر. 2009.

- بلقاسم عباس، **سياسات أسعار الصرف**، اصدارات جسر التنمية، المعهد العربي للتخطيط بالكويت،العدد23 ، نوفمبر2003.

- توفيق الصادق ، **سياسات وإدارة أسعار الصرف في البلدان العربية** "،صندوق النقد العربي، ابو ظبي.الامارات العربية المتحدة 1997

- تومي صالح ،"**مدخل لنظرية القياس الاقتصادي**"، ديوان المطبوعات الجامعية، الجزائر. 1999 .

- حميدات محمود ،"**مدخل للتحليل النقدي**" ديوان المطبوعات الجامعية، الجزائر. 2000 .
- عبد المجيد قدي: **المدخل إلى السياسات الإقتصادية الكلية**- ديوان المطبوعات الجامعية. الجزائر 2004/2003.
- لحلو موسى بوخاري، **سياسة الصرف الأجنبي و علاقتها بالسياية النقدية**،مكتبة الحسن العصرية للطباعة و النشر و التوزيع، لبنان، 2010.
- موسى سعيد مطر ، شقيري نوري موسى و ياسر المومني ، **المالية الدولية**، الطبعة الأولى، دار الصفاء للنشر و التوزيع، عمان، الأردن، 2008.

- Notes :

[1]– عبد الحسين جليل عبد الحسن الغالبي، **سعر الصرف و إدارته في ظل الصدمات الاقتصادية (نظرية و تطبيقات)**،الطبعة الأولى،دار صفاء للطباعة و النشر و التوزيع،عمان،. الأردن، 2011 ، ص: 27.

[2].مصطفى سلمان حسام، عماد الصعيدي، **مبادئ الاقتصاد الكلي** دار المسيرة والتوزيع، عمان سنة 2000 ، ص 177

[3].عبد الحسين جليل عبد الحسن الغالبي، نفس المرجع أعلاه، ص:29 .

[4] Rudiger Dornbusch , **Exchange rates and inflation** , MIT Press, Cambridge, Mass. (1988). PP 122.

[5] Innwon Park, "**Trade Liberalization and Long-run Economic Growth - A CGE Model Analysis of AFTA**",Graduate School of International Studies, Korea University, 2003, PP:40.