# The effect of exchange rate on domestic inflation, empirical evidence from Algeria

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**Abstract**

The exchange rate has taken more interest in recent years, specialists have recently devoted much attention for studying exchange rate pass-through to domestic prices and inflation, this study examines the relationship between the nominal effective exchange rate and the inflation in Algeria, as well as the estimation of the short run and the long run inflation dynamic.

The results based on bound testing and error correction mechanism confirm that a stable, long run relationship exists between nominal effective exchange rate and inflation in the long run.

**Key words**: nominal effective exchange rate, inflation, bound test

**JEL classification codes:** C32, F41, E52.

**ملخص**

تزايد الاهتمام في السنوات الأخيرة من طرف الباحثين لدراسة تأثير انتقال أسعار الصرف على معدلات التضخم المحلية، نقوم في هذا البحث بدراسة العلاقة بين سعر الصرف الاسمي ومعدل التضخم في الجزائر وكذلك تقدير الآثار الديناميكية للتضخم قصيرة الأجل وطويلة باستعمال منهجية اختبار الحدود، أثبتت نتائج الدراسة وجود علاقة معنوية طويلة الأجل بين معدل التضخم وسعر الصرف الاسمي الفعال.

**كلمات مفتاحية** :سعر الصرف الاسمي الفعال، التضخم، اختبار الحدود.

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## 1. Introduction

The inflation in Algeria has widely fluctuated between from 2003 to 2011, going from 1 percent in 2003 to 7 percent in 2009, at the beginning of 2012 prices increased and reached 11 percent, before 2007 inflation in Algeria was most of the time lower in comparison with the trading partners of Algeria, but from 2007 onwards it became higher and more volatile with a large and widening gap in 2012, a simple decomposition of inflation covering the period 2011-2012 confirms that the share of food in overall inflation increased from 2 percent in late 2011 to almost 8 percent in April, which could explain the 2012 spike of inflation that has seen in 2012, There are also other factors that may have contributed to this spike in inflation such as, the large increase in real wages and other transfer, moreover, credit to public sector increased by more than 20 percent in 2012 (S. Ben Naceur, 2012, p.23).

In 2016, average inflation increased from 4.8 percent in 2015 to 6.4 in 2016, largely triggered by some factors related to supply factor problems and distortions in distribution channels, as well as to the higher price for manufactured and imported goods, the average inflation stood at 6.9 percent year to year in march 2017, but it was mostly volatile in 2016 due to a large variability in food prices, the recent planned procedures such as value add tax increase and subsidy reform have fueled inflationary effects, inflation still above the bank of Algeria target 4 percent (IMF country report, 2017, p.4-5).

Exchange rate regimes in Algeria have seen many different forms in the last six decades. From 1974, the exchange rate of Algerian Dinar was pegged to a basket of currency, in which the U.S. dollar was given a relatively large weight due to its importance in hydrocarbon export receipts and debt-service payments. After the oil shock in 1986, the Bank of Algeria allowed the Algerian dinar to depreciate against the basket. In 1994, exchange rate in Algeria has seen much gradual devaluation in accordance with the recommendations of the adjustment program signed with IMF to correct the previous real appreciation of the Algerian dinar. Since 1995, Algeria’s exchange rate policy has focused on maintaining a stable real

exchange rate, therefore, a managed float regime was implemented from 1996 until today to achieve this goal through exchange rate market, the Bank of Algeria intervene in the market periodically to adjust the path of real exchange rate (Samir AIT YAHIA et al, 2017, p.46.47).

Algeria's exchange rate policy was designed to target a real effective exchange rate close to its fundamental value, The REER depreciated 21 percent from 2001–07, together with a depreciation of the nominal effective exchange rate. Since 2007, the REER has been on a modest rising trend. In 2012 a spike in inflation driven by expansionary fiscal policy caused a 4.5 percent appreciation of the real effective exchange rate (IMF country report, 2014, p.46.47).

Despite the volatility in inflation in 2012, the real effective exchange rate (REER) remains close to its equilibrium level. After a slight depreciation (0.6 percent) in 2011, the REER appreciated by 5.8 percent (on a year-to-year basis) over the first nine months of 2012. This appreciation was largely driven by an increase in inflation differential between Algeria and its main trading partners offset only in part by a 2 percent nominal effective exchange rate depreciation. Nevertheless, the REER stays in line with its equilibrium level (IMF country report, 2013, p.4-5).

In 2016, the real effective exchange rate depreciated but it still considerably overvalued. Despite a 25 percent depreciation of the dinar against the dollar, the nominal effective exchange rate depreciated only by 6.7 percent in 2015, due to the depreciation of other trading partners 'currencies. The real effective exchange rate (REER) depreciated by 4.3 percent, as the nominal depreciation was partly compensated by an increase in Algeria's prices relative to those in its trading partners. The REER remains significantly overvalued which can negatively impact Algeria's competitiveness, therefore, further exchange rate depreciation still be consistent with the actual debt sustainability, this depreciation would increase hydrocarbon revenues in local currency and reduce demand for import, it can also restore fiscal sustainability and supporting the diversification of the economy in the medium term without fueling inflation (IMF country report, 2016, p. 4-5).

## 2. Overview of the literature

The mechanism of exchange rate effect on domestic prices has long been of concern and has produced many studies over the years specially in developed countries ,this effect is known as; the exchange rate pass through. the rapid globalization and trade liberalization have increased the importance of studying this effect; the ability of firms to insulate themselves from movements in exchange rate is a function of the level of exchange rate pass through to domestic prices, we will survey only a few important studies concerning pass-through that have focused on developing countries and Algeria.

(Samir AIT yahia et al 2017) estimated a long run relationship between the real effective exchange rate and some fundamentals as proxies for market segmentation, that data used were annual covering the period 1980 to 2015, they used a johansen multivariate approach to estimate the long run relationship, they found a positive support for a long run association between variables, however, they also found a three periods of large misalignment between the exchange rate and the equilibrium exchange rate which may suggest that pass through of exchange rate is incomplete and purchasing power parity does not hold.

(Yuri Ponomarev et al, 2014) estimated the short-run and medium-run exchange rate pass-through into domestic prices in Russia during the period of 2000–2012 using vector error correction model, using the VECM methodology, they found a significant exchange rate pass through in the short run and the long run, but the pass through was incomplete in both periods, he results of the estimates indicated the existence of exchange rate pass through asymmetry (different nature of the effect of appreciation and depreciation of the local currency on price level) for all price indices. A depreciation of the national currency leads to growth in prices, whereas, its appreciation triggers no fall of prices

(Campa, Goldberg, 2002), provided cross-country and time series evidence on the endogeneity of exchange rate pass through to country's macroeconomic condition as well as the prevalence of currency pricing to import between producer currency pricing and the local currency pricing for

25 OECD countries, higher inflation and exchange rate pass through volatility were weakly associated with higher pass through of exchange rates into import prices, on the other hand, however, the most important factors of change in pass over time in OECD countries through were microeconomic and related to industrial structures.

(Ben Naceur, 2012) investigated the determinants of inflation in Algeria to examine the factors behind the spike of inflation observed in 2012, the author used multivariate johansen methodology to analyze the long run relationship between the variables of the study during the period running from 2002 to 2011, he found a significant long run relationship between the variables, the result of the study showed that the exchange rate is negatively and significantly associated with domestic prices in the long run, however, money supply and real GDP are the most important determinants of long run price change.

**3. The methodology**

To estimate the relationship between inflation and the exchange rate, we have used the ARDL approach or the autoregressive distributed lag model which deals with single cointegration and is introduced originally by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001). The ARDL approach has many advantages in comparison with the Johansson method; it can be used if we have series with different order of integration, that is I(0) and I(1), the variables can be assigned different lag lengths, it involves the estimation of one single equation. the bound test method has certain econometric advantages in comparison to other method of cointegration (Nicolaos dritsakis, 2011, p.9).

- all variables in the model are assumed to be endogenous.
- bound test method is being applied irrespectively to the order of integration.
- the short run and the long run coefficient are estimated simultaneously.

The general model of ARDL can be expressed as:

$$\Delta lINF_t = a_0 + \sum a_{1i}\Delta INF_{t-i} + \sum a_{2i}\Delta NEER_{t-i} + \gamma dummy_t + b_1 INF_{t-1} + b_2 NEER_{t-1} + e_t$$

Where all variable are in the log form, $a_0$ is a drift component, INF is the inflation; NEER is the nominal effective exchange rate.

To see if there is any long run relationship between inflation and exchange rate, we form a joint hypothesis test where the null and alternative hypotheses are:

$$\begin{cases} h_0: b_1 = b_2 = 0 \\ h_1: b_1 \neq b_2 \neq 0 \end{cases}$$

The general model for ARDL can also expressed as:

$$\Delta lINF_t = a_0 + \sum a_{1i}\Delta INF_{t-i} + \sum a_{2i}\Delta NEER_{t-i} + \gamma dummy_t + \lambda EC_{t-1} + u_t$$

Where λ is the speed of adjustment towards equilibrium, and EC is the residuals obtained from the general equation of the ARDL model

We include a dummy variable that takes a value 1 after 1990 and zero otherwise to reflect the change in policy after the year 1990 towards a more liberalized economy through the structural adjustment program with the International Monetary Fund, which contributed to the progressive liberalization of prices and exchange rates.

The null hypothesis is tested by using the F distribution, which is non-standard under null hypothesis being true, the critical values of the F distribution are available in Pesaran (1996) and Pesaran et al(2001), they provide two sets of critical values; one set assuming that all the variables are I(0) which match up with the lower band, meaning that there is no cointegration among the underlying variables, and the other supposing that all the variables are I(1) which means that there is a cointegration among the underlying variables, the decision about the presence of cointegration is done by comparison between the F value and the two bounds; when the computed value of F statistics is greater than the upper bound critical value, the null hypothesis is rejected, if the F statistics is below the lower bound critical value, the null hypothesis cannot be rejected, if it falls between the lower and upper bound the result of the inference is inconclusive (Emeka Nkaro et al, 2016).

The general model used by many researchers (Goldberg-knetter, camp Goldberg, Gobinath and Rigobon and others) to estimate the effect of exchange rate change on international prices has the following form

(Pinelopi.k Goldberg and Michael M. Knetter, 1996, p.6):

$$p_t = \alpha + \gamma e_t + \psi z_t + \varepsilon_t$$

Where all variables are in logs, p is the log price for a particular product, e is log the spot exchange rate, and z denotes other control variables in the model, and $\varepsilon_t$ is error term, and α is an arbitrary constant that can help mitigate the problem arising from the use of price indices and the possibility of non-identical goods.

Under some assumptions, the pass through effect is measured by the value and the significance of coefficient γ, that is, if the pass-through of exchange rate is complete γ must equal 1, and purchasing power parity holds, by contrast, if the pass trough of exchange rate is incomplete, γ must be less than 1, and purchasing power parity does not hold (Pinelopi K. Goldberg and Michael M. Knetter, 1997, p. 1429).

We use the following model to express the short run dynamic of the underlying variables, which also can also be reparametrized as ARDL model.

$$inf_t = \Delta p_t = \alpha + \gamma \Delta neer_t + \psi z_t + \varepsilon_t$$

Where inf is the consumer price index in Algeria, neer is the nominal effective exchange rate in Algeria

Neer is a measure of the value of a national currency against a weighted average of several foreign currencies (the main trading partners for Algeria).

Economists have usually made the simplifying assumption that the prices of tradable goods are equalized across countries when expressed in the same currency, in other words, the purchasing power parity condition (PPP) holds continuously. Empirically, however, researchers have found in general little support for this assumption, at least in the case of small samples and in the short to medium run. According to this evidence, the theoretical literature established over the past two decades has provided different explanations why the exchange rate pass-through is incomplete ( Michele Ca' Zorzi et al, 2007, p.6).

The purchasing power parity suggests that the real exchange has the mean reverting property of stationary time series, although it may move

away from its mean for several years at a time. The PPP can be considered as the most widely used concept by economists and market analysts who wish to estimate the equilibrium real exchange rate. The most extensively used methodology to confirm or reject PPP is based on the analysis of the time series properties of the REER which is presumed to measure changes in price level differences between a country and its trading partners If the REER series is stationary and the speed of convergence of the REER towards its mean is sufficiently fast, then PPP can be considered to hold. Slow convergence otherwise is inconsistent with PPP, which only allows for short-term deviations from equilibrium (Taline Koranchelian, 2005, p.5-6).

If purchasing power parity holds in the long run, then the real exchange rate must be stationary not necessarily about zero mean, if we model the real exchange rate in the form below

$$\Delta reer_t = f(t) + (\rho - 1) reer_{t-1} + \sum a_i \Delta reer_{t-i} + \epsilon_t$$

A practical problem with the AR(1) based unit-root test is that the residuals obtained from this model are more likely to be auto correlated. To circumvent this problem, one can add sufficiently many lagged to the dependent variables on the right-hand side of the equation in the above equation until the residuals appears to be white noise , if the null hypothesis of unit root cannot be rejected we conclude that the real effective exchange rate is not stationary and purchasing power does not hold.

f(t) in the above equation denotes a deterministic function of time as many time series appears to have an upward or downward time trend .when testing for the unit, It turns out that the critical values vary with the choice of f(t). Three cases of critical values have been provided for the test (Svetlozar T. Rachev, 2007, p.250).

*Case 1*: pure random walk where $f(t) = 0$

*Case 2*: random walk with constant drift where $f(t) = c$

*Case 3*: random walk with a deterministic linear trend where $f(t) = c0 + c1t$

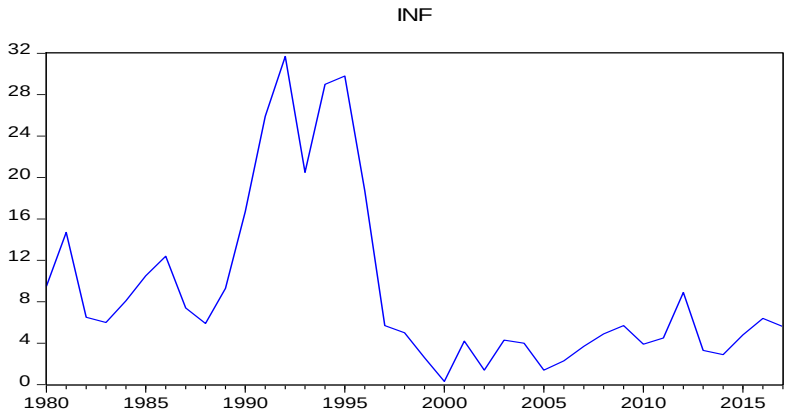
**4. The Data**

This study uses an annual time series data covering the period from 1981 to 2017, the data were obtained from international monetary fund, the variables used in this study are: INF inflation based on consumer price

index, it reflects the annual percentage change in the cost of acquiring a basket of goods and services where the base year is (2010), NEER is the nominal effective exchange rate, defined in IMF statistics as an index of a currency's period-average exchange rate to a weighted geometric average of exchange rates for currencies of selected countries and the euro area, the nominal effective exchange rate index is based on manufactured goods and primary products trade with partner or competitor countries the base year(2010).

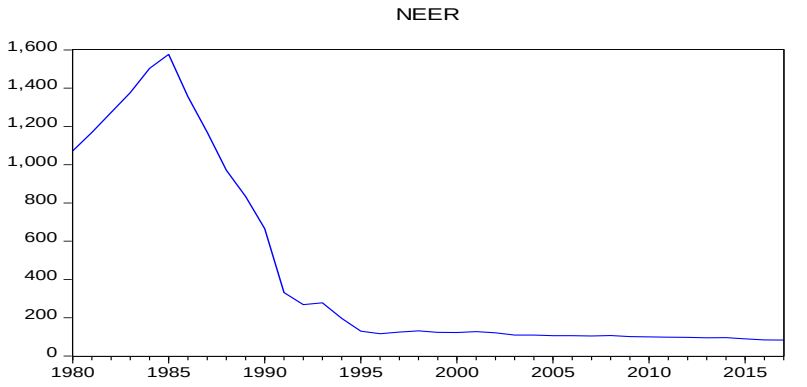
The series for inflation, nominal effective exchange rate and real effective exchange rate are presented in the figure1, 2 and 3 respectively.

**Fig. 1**: inflation in Algeria during the period 1980-2017



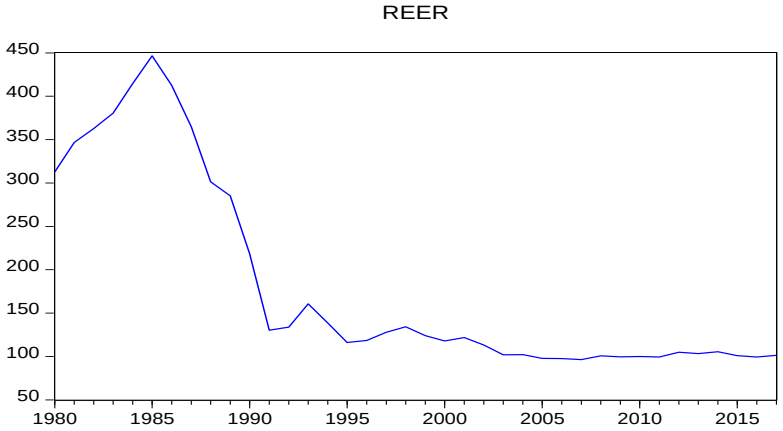

**Source:** international financial statistics

**Fig 2**. nominal exchange rate in Algeria during the period 1980-2017




**Source**: international financial statistics

**Fig 3.** The evolution of real effective exchange rate in Algeria during the period 1980-2017.




**Source**: international financial statistics

## 5. Empirical results

The empirical investigation the long-run mean reversion properties of exchange rate can be considered as the most widely used concept to assess the PPP, as can be seen from figure 03 the series REER does not have a clear trend but it involves around a non-zero mean, therefore a constant is included in the unit root test, The of unit root test of is shown in table 01.

**Table 1.** unit root test for real effective exchange rate in Algeria

| **Null hypothesis: NEER has a unit root**<br>**Lag length:3 (Automatic-based on AIC, maxlag=4)** | | |
|---|---|---|
| | **T stat** | **Prob** |
| Augmented Dickey-Fuller test statistics | -2.6531 | 0.0927 |

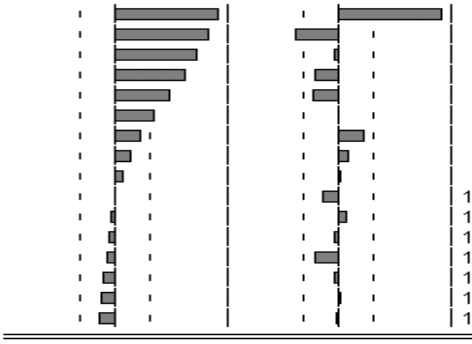
**Source:** Eviews 10 output

From the result of table 01 above the null hypothesis of non stationarity is not rejected, the P value is more than 9 percent which is greater than 5 percent the chosen level of significance, therefore the level the real exchange rate does not exhibit mean reversion properties and purchasing power parity does not hold in Algeria according to this test.

In addition the previous result, if the series of real effective exchange rate is white noise, this will represent evidence that series is not stationary, the figure 04 below shows the result of this test.

**Fig 4**. the white noise test of real effective exchange rate series

Sample: 1980 2017
Included observations: 38



| Autocorrelation | Partial Correlation | | AC | PAC | Q-Stat | Prob |
|---|---|---|---|---|---|---|
| | | 1 | 0.949 | 0.949 | 37.003 | 0.000 |
| | | 2 | 0.861 | -0.405 | 68.267 | 0.000 |
| | | 3 | 0.760 | -0.041 | 93.328 | 0.000 |
| | | 4 | 0.641 | -0.224 | 111.72 | 0.000 |
| | | 5 | 0.500 | -0.242 | 123.23 | 0.000 |
| | | 6 | 0.355 | 0.004 | 129.22 | 0.000 |
| | | 7 | 0.237 | 0.227 | 131.97 | 0.000 |
| | | 8 | 0.145 | 0.087 | 133.04 | 0.000 |
| | | 9 | 0.069 | 0.016 | 133.28 | 0.000 |
| | | 10 | 0.002 | -0.145 | 133.28 | 0.000 |
| | | 11 | -0.037 | 0.066 | 133.36 | 0.000 |
| | | 12 | -0.053 | -0.031 | 133.53 | 0.000 |
| | | 13 | -0.075 | -0.228 | 133.87 | 0.000 |
| | | 14 | -0.106 | -0.044 | 134.58 | 0.000 |
| | | 15 | -0.130 | 0.022 | 135.71 | 0.000 |
| | | 16 | -0.150 | -0.020 | 137.26 | 0.000 |

**Source**: Eviews 10 output

As can be seen from the figure 04, all the P values are zero, therefore the null hypothesis that all true correlation coefficients up to 16 lag are zero is significantly rejected, we conclude the series for REER is neither white noise series nor a stationary process which give another evidence that purchasing power parity doesn't hold.

To estimate the long run equilibrium between inflation and exchange rate as well as the short run dynamic as an ARDL model, we must check the order of integration of each series; the results are shown in the figure 05 below.

**Fig 5**. The unit root test for inflation and nominal effective exchange rate

**UNIT ROOT TEST RESULTS TABLE (ADF)**
Null Hypothesis: the variable has a unit root

| | | At Level | |
|---|---|---|---|
| | | NEER | INF |
| With Constant | t-Statistic | -4.6255 | -1.8363 |
| | *Prob.* | ***0.0009*** | ***0.3578*** |
| | | *** | n0 |
| With Constant & Trend | t-Statistic | -3.6135 | -2.0954 |
| | *Prob.* | ***0.0461*** | ***0.5313*** |
| | | ** | n0 |
| Without Constant & Trend | t-Statistic | -4.9515 | -1.3128 |
| | *Prob.* | ***0.0000*** | ***0.1716*** |
| | | *** | n0 |
| | | **At First Difference** | |
| | | d(NEER) | d(INF) |
| With Constant | t-Statistic | -3.6106 | -5.5553 |
| | *Prob.* | ***0.0113*** | ***0.0000*** |
| | | ** | *** |
| With Constant & Trend | t-Statistic | -4.7079 | -5.4693 |
| | *Prob.* | ***0.0036*** | ***0.0004*** |
| | | *** | *** |
| Without Constant & Trend | t-Statistic | -3.3807 | -5.6253 |
| | *Prob.* | ***0.0014*** | ***0.0000*** |
| | | *** | *** |

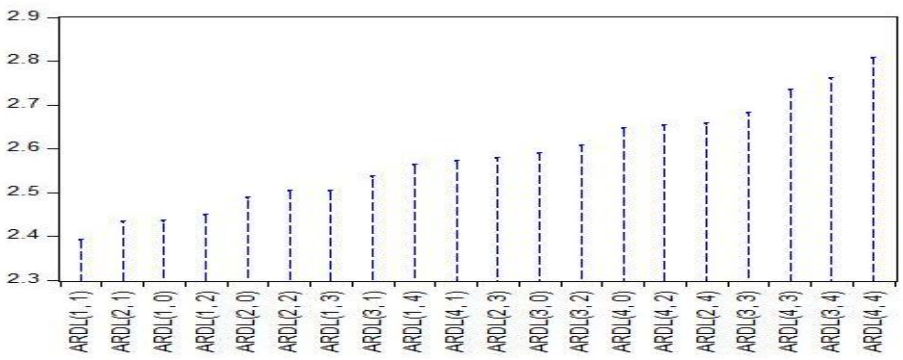
**Source**: Eviews 10 output

A constant in an equation for the first difference of a variable implies including a linear time trend in the level of the data, and, by the same token, a quadratic time trend in a level equation for the variable represent a linear time trend in the first difference equation (Sean Beckatti, 2013, p.391), the variables in this study appear to have a constant as well as an upward trend, therefore we have included a trend and drift in unit root testing.

As can be seen from figure 05 the exchange rate and inflation series do not have the same order of integration, and none of the two variables are I(2), therefore we use the ARDL methodology to estimate the long run relationship between them, But before we do any meaningful estimation we should determine the lag order that will be included in the model.

Information criteria have been shown to be useful in selecting the lag order of a variable, all criteria are likelihood based and involve two components, the first component is related to the goodness of fit of the model, whereas the second component is a penalty factor for introducing too many variables, in this model we use Schwarz criteria because it is consistent estimator (Ruey S. Tsay, 2014, p.63).

**Fig 6.** The lag order selection by Schwarz criteria




**Source**: Eviews 10 output

The lag order chosen by Schwarz criterion in this case is ARDL( 1.1), one lag for both the dependent variable and the dependent variable.

To test if there is any long run relationship between inflation and exchange rate we use the bound test, the null hypothesis is no long run relationship exists between the variables, the results of the bound test are reported in the figure 07.

**Fig 7.** ARDL bound test for inflation and nominal effective exchange rate

Levels Equation
Case 2: Restricted Constant and No Trend

| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| LOG_NEER | 0.877392 | 0.264358 | 3.318951 | 0.0023 |
| C | -4.171499 | 1.900487 | -2.194963 | 0.0355 |

EC = LOG_INF - (0.8774*LOG_NEER -4.1715 )

F-Bounds Test — Null Hypothesis: No levels relationship

| Test Statistic | Value | Signif. | I(0) | I(1) |
|---|---|---|---|---|
| | | Asymptotic: n=1000 | | |
| F-statistic | 5.468610 | 10% | 3.02 | 3.51 |
| k | 1 | 5% | 3.62 | 4.16 |
| | | 2.5% | 4.18 | 4.79 |
| | | 1% | 4.94 | 5.58 |
| Actual Sample Size | 37 | | Finite Sample: n=40 | |
| | | 10% | 3.21 | 3.73 |
| | | 5% | 3.937 | 4.523 |
| | | 1% | 5.593 | 6.333 |
| | | | Finite Sample: n=35 | |
| | | 10% | 3.223 | 3.757 |
| | | 5% | 3.957 | 4.53 |
| | | 1% | 5.763 | 6.48 |

**Source**: Eviews 10 output

As can be seen from the figure 07 that F statistics for the bound test is 5.46, it exceeds the 10*%*, 5*%* critical values for the upper bound, we reject the null hypothesis of no long run relationship, but the test is not significant for 1*%* critical value, we also reject the null hypothesis of no cointergration for the critical values provided by Narayan (2005) at 1 percent and 5 percent significance level, the Narayan critical values are used because those in Pesaran et al. (2001) cannot be applied for small sample sizes as they are based on large sample sizes.

The ARDL methodology require that the residuals to be serially uncorrelated, to verify whether the residuals from the model are serially uncorrelated or not, we have used Breusch Goldfrey serial correlation LM test, the result is shown in the figure 08 below.

**Fig 8**. Breusch Goldfrey serial correlation LM test

Breusch-Godfrey Serial Correlation LM Test:

| | | | |
|---|---|---|---|
| F-statistic | 1.537414 | Prob. F(2,30) | 0.2314 |
| Obs*R-squared | 3.439736 | Prob. Chi-Square(2) | 0.1791 |

**Source**: Eviews 10 output

Since the null hypothesis in the Breusch Goldfrey serial correlation LM test is that the residuals are serially uncorrelated, the F-statistic p-value of 0.2314 indicates that we will fail to reject this null. We therefore conclude that the residuals are serially uncorrelated.

To test for residual homoskedasticity, we have used Breusch-Pagan-Godfrey the output is shown in the figure 09..

**Fig 9**. Breusch –Pagan-Goldfrey test for residuals heteroskedasticity

Heteroskedasticity Test: Breusch-Pagan-Godfrey

| | | | |
|---|---|---|---|
| F-statistic | 0.770505 | Prob. F(4,32) | 0.5524 |
| Obs*R-squared | 3.250519 | Prob. Chi-Square(4) | 0.5168 |
| Scaled explained SS | 7.764529 | Prob. Chi-Square(4) | 0.1006 |

**Source**: Eviews 10 output

Since the null hypothesis is that the residuals are homoskedastic, the F-statistic P-value of 0.5524 indicates that reject this null is not rejected, We therefore conclude that the residuals are homoskedastic.

According to figure 10 the error correction coefficient (-0.55) is negative as required and is very significant, with P value equal to 0.0002, which mean that about 55% of the deviation from the long run disequilibrium is corrected in the last period within one year, but nominal effective exchange rate is not significant in explaining the inflation behavior in the short run, this can be explained by price rigidity in the short run as well as many factors related to problems in supply side and distribution channels, it may also reflect the large percentage of regulated prices that are included in the compositions of consumer price index in Algeria, therefore the price liberalization may give greater credibility to access the success of the central bank in achieving the inflation target announced to the public.

An interesting feature of the log linear model is that the slop coefficients can be interpreted as elasticities, in other words, they are explained as the percentage change in the dependent variable for a percentage change in the independent variable, the advantage of elasticities is that they are devoid of units of measurement, from the figure 07 we see that 1 percent increase of exchange rate will lead to about 80 percent increase in inflation in the long run assuming all other variables are constant which mean that inflation is very sensitive to the international food

price, as a result, the policy maker can benefit from this high pass through of exchange rate for anchoring inflation expectation through more exchange rate management.

**Fig 10**. Error correction mechanism regression for inflation and exchange rate

ECM Regression
Case 2: Restricted Constant and No Trend

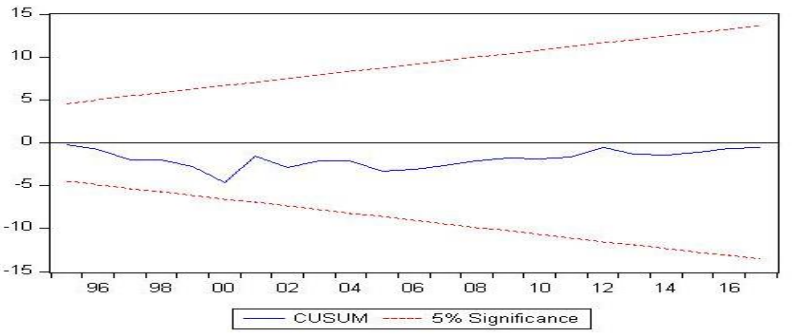
| Variable | Coefficient | Std. Error | t-Statistic | Prob. |
|---|---|---|---|---|
| D(LOG_NEER) | -1.043398 | 0.705095 | -1.479797 | 0.1487 |
| DUMMY | 0.770442 | 0.243904 | 3.158795 | 0.0034 |
| CointEq(-1)* | -0.557412 | 0.133510 | -4.175068 | 0.0002 |

| | | | |
|---|---|---|---|
| R-squared | 0.351117 | Mean dependent var | -0.014333 |
| Adjusted R-squared | 0.312948 | S.D. dependent var | 0.786822 |
| S.E. of regression | 0.652186 | Akaike info criterion | 2.060630 |
| Sum squared resid | 14.46177 | Schwarz criterion | 2.191245 |
| Log likelihood | -35.12165 | Hannan-Quinn criter. | 2.106678 |
| Durbin-Watson stat | 2.346060 | | |

**Source**: Eviews 10 output

Once the error correction models have been estimated, Pesaran and Pesaran suggest applying the cumulative sum of recursive residuals to assess the parameter stability of the model, this test is shown in the figure 10.

**Fig 11.** Cusum stability test of the model




**Source**: Eviews 10 output

The statistics of cusum is plotted with 5percent significance bounds, we see from figure 10 that cusum statistics revolves around zero within its confidence bound, therefore the null hypothesis of parameters stability in not rejected.

## 6. Conclusion

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.

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