OEB Univ. Publish.

The Impact Of Oil Price Fluctuations In The Algerian Dinar Exchange Rate Against Dollar -Econometric Analytical Study On During The Period 2004-2018

أثر تقلبات أسعار النفط في سعر صرف الدينار الجزائري مقابل الدولار-دراسة تحليلية اقتصادية خلال الفترة 2004-2018

Ferrah Ahlem [1*], Ouledzaoui Abderahmane [2]

[1] Laboratory Of Finance Accounting Levy And Insurance, university of soukahras (algeria), a.ferrah@univ-soukahras.

[2] Laboratory For Research And Economic Studies, University Of Soukahras (Algeria), ouledzaoui80@gmail.com.

Abstract

    The study aims to test the effects of oil price fluctuations on algeria's exchange rate for the period 2004-2018, using standard analysis tools through a simple linear regression model (OLS).

    The study concluded that the higher the price of oil in the international markets, the US dollar, but these results can be explained by the increase in the the monetary mass as a result of process of monetization (foreign currency) and increased public spending to finance large economic programs, notably the program to support economic recovery.

Keywords : Oil Price ; Algerian Dinar Exchange Rate ; Fluctuations ; Econometric Study

ملخص

تهدف هذه الدراسة إلى اختبار أثار تقلبات أسعار النفط على سعر الصرف في الجزائر للفترة 2004-2018، وذلك باستخدام أدوات التحليل القياسية من خلال نموذج الانحدار الخطي البسيط (طريقة المربعات الصغرى العادية).

وختمت الدراسة أنه كلما ارتفع سعر النفط في الأسواق الدولية زاد سعر صرف الدينار الجزائري الاسمي مقابل الدولار الأمريكي، إلا أنه يمكن تفسير هذه النتائج بزيادة الكتلة النقدية نتيجة عملية التنقيد (العملة الأجنبية) وزيادة الانفاق العام لتمويل البرامج الاقتصادية الضخمة وعلى رأسها برنامج دعم الإنعاش الاقتصادي.

الكلمات المفتاحية: سعر النفط، سعر صرف الدينار الجزائري، تقلبات، دراسة قياسية.

* Corresponding Author

1. INTRODUCTION

The collapse of global oil and natural gas prices has battered the Algerian economy at a time of degenerating security conditions in Northern Africa, raising concerns about the ability of the OPEC nation to weather the resulting economic, political, and security shocks, and inviting comparisons between the current situation and the catastrophic events experienced by the country during the 1986–1988 oil price collapse and in its aftermath. Algeria's security and energy future are of critical importance: it holds a strategic position in the Western Mediterranean and was one of two North African countries that remained stable during the Arab Spring and the subsequent years. It is also the largest natural gas producer in Africa and a major LNG exporter. It is the number-two exporter of natural gas to Europe and a key supplier of oil to its Mediterranean countries.

The collapse of oil prices that began in mid-2014 has clearly had a major and sometimes destabilizing impact on nations heavily reliant on oil and natural gas export revenue. Algeria is no exception, and its ability to withstand the economic blow could have major implications for the world and especially Europe, the nation's largest trading partner, the top consumer of its oil and gas exports, and its neighbor in the Mediterranean.

With hydrocarbon exports making up well over 90 percent of exports earnings, the price of oil is the major determinant of the exchange rate. A government board implements a managed float system for the dinar, which is convertible for all current account transactions. Private and public importers may buy foreign exchange from five commercial banks for commercial transactions provided they can pay for hard currency in dinars. Although commercial banks may buy foreign exchange from the Bank of Algeria at regular weekly auctions, at which they set the dinar's exchange rate, they are no longer required to surrender to the Bank of Algeria the foreign exchange they acquire and may trade these resources among themselves. However, since the central bank buys the foreign hydrocarbon export proceeds of the national oil company, SONATRACH, the bank plays the dominant role in the foreign exchange market. The primary objective of its intervention policy is to avoid sharp fluctuations in the exchange rate.

Political and legal institutions affect the extent to which the real exchange rates of oïl-exporting countries co-move with the oil price. In a simple theoretical model, strong institutions insulate real exchange rates

from oil price volatility by generating a smooth pattern of fiscal spending over the price cycle. Empirical tests on a panel of oil- exporting countries provide evidence that countries with high bureaucratic quality and strong and impartial legal systems have real exchange rates that co-move less with the oil price.

In recent years, the world economy has been characterized by increased opening processes and increased international trade, which requires trade liberalization and the introduction of currency convertibility. From this perspective, the exchange rate is a macroeconomic variable that plays a strategic and considerable role in international trade, and a fundamental role in the development process. A competitive value of the exchange rate is likely to favour exports (and thus trade surpluses) and is necessary for the sustainability of the growth process. In the majority of open economies, it is an instrument for adjusting their monetary policy. this article deals with the following question:

- **Problematic**
  - **What's the impact of oil prices' fluctuations on an important economic factor: exchange rate?**
- **Hypothesis**
  - There is a positive inverse relationship between fluctuations in exchange rates and the oil price.
- **Research methodology**
  - We used the descriptive analytical approach, in order to examine the concepts of exchange rate, point rate and development, and will use methods, and to measure the relationship between the exchange rate of the algerian dinar and the revenues, obtained in each of them and the standard and statistical methods necessary to study the relationship between the interpreted and variable variable, where it was followed. Many statistical programs, the most important of which are Eviews 11.

2. GENERAL POLICY FRAMEWORK OF THE ALGERIAN ECONOMY

The Algerian market offers significant commercial opportunities to U.S. exporters and investors. Algeria has large proven oil and gas reserves with the potential for additional discoveries. U.S.

2.1 World Real Price of Oil:

The link between the price of oil and exchange rate has followed two main avenues. The first one focuses on oil as a major determinant of the terms of trade. Amano and van Norden (1998) propose a model with two sectors; tradable and non-tradable goods. Each sector uses both a tradable input (oil) and a non-tradable one (labour). Besides constant returns to scale technology, it assumes that inputs are mobile between the sectors and that both sectors do not make economic profits. The output price of the tradable sector is fixed internationally; hence the real exchange rate corresponds to the output price in the non-tradable sector. A rise in the oil price leads to a decrease in the labour price so as to meet the competitiveness requirement of the tradable sector. If the non-tradable sector is more energy intensive than the tradable one, its output price rises and real exchange rate appreciates. The opposite applies if the nontradable sector is less energy intensive than the tradable one. Accordingly, for oil importing country, a real oil price hike may increase the price of tradables relative to non-tradables by a bigger proportion than that of in the oil exporting country and thus cause a real depreciation of their currencies. For oil exporting country, a real oil price increase may lead to appreciation of the real exchange rate as prices of nontradable goods increase relative to tradables. However, due to the small-country assumption, Amano and van Norden (1998)'s approach neglects the fact that tradable prices can rise worldwide following an oil price shock. Thus, allowing for this possibility (while keeping the law of one price in the tradable sector) allows one to conclude that real oil price effect on real exchange rate will depend on the oil intensity of both tradable and non-tradable sectors of the countries under review (Benassy-Quere et al., 2007). A second strand of the literature (Krugman, 1983a,b, Golub, 1983) focuses on the balance of payments and international portfolio choices. Krugman (1983a,b) note that in a three-country world Europe, America and OPEC, higher oil prices will transfer wealth from the oil importers (America and Europe) to oil exporters (OPEC). The real exchange rate equilibrium in the long run will depend on the geographic distribution of OPEC imports, but no longer on OPEC portfolio choices. Assuming that oil-exporting countries have a strong preference for dollar-denominated assets but not for US goods, an oil price hike will cause the dollar to appreciate in the short run but not in the long run. In particular, Krugman

(1983 a,b) posited that if America is a relatively small share of OPEC's export market but a large share of OPEC's import market, then the transfer of wealth from the industrial countries to OPEC would tend to improve the US trade balance. The introduction by Golub (1983) of a fourth country (the United Kingdom) and a third currency (the sterling) does not change the qualitative conclusions. **(izraf & Aziz, 2009).** The next table shows the order of state oil production for 2019 :

Table 1. List of countries by oil production for 2019

|	country	Oil production (bbl/dy)	Oil production per capita (bbl/day/million people)
-	**World production**	80.622.00	10.798
01	**United States**	15.043.000	35.922
02	**Saudi Arabia (OPEC)**	12.000.000	324.866
03	**Russia**	10.800.000	73.292
04	**Iraq (OPEC)**	4.451.516	119.664
05	**Iran (OPEC)**	3.990.956	49.714
06	**China**	3.980.650	2.836
07	**Canada**	3.662.694	100.931
08	**U.A.E (OPEC)**	3.106.077	335.103
09	**Kuwait (OPEC)**	2.923.825	721.575
10	**India**	2.515.459	554
11	**Venezuela (OPEC)**	2.276.967	69.914
12	**Mexico**	2.186.877	17.142
13	**Nigeria (OPEC)**	1.999.885	10.752
14	**Angula (OPEC)**	1.769.615	61.417
15	**Norway**	1.647.975	313.661
16	**Kazakhstan**	1.595.199	88.686
17	**Algeria (OPEC)**	1.348.361	33.205
18	**Oman**	1.006.841	217.178
19	**Libya (OPEC)**	1.003.000	159.383
20	**United Kingdom**	939.760	14.284

Source: (www.marefa.org, 2019).

Algeria's proximity to Europe makes it a classical case of how the global financial crisis has hit the North African countries. It is mostly analysed in the group of countries referred to as the Middle East and North African (MENA) countries or countries in the Arab region.

Algeria's economic position in the wider Arab countries is also important. It belongs to the first group of Arab countries1 (which are categorized into three groups). This first group is the oil producing countries (Saudi Arabia, Kuwait, UAE, Qatar, Oman, Bahrain, Libya, and Algeria). In 2008, oil contributed 36 per cent of total value added, 85 per cent of export revenues and 71 per cent of government fiscal receipts. Therefore, for these countries, the economic implications of the crisis may not be considerable, especially in the short run, since they have accumulated high reserves and huge budget surpluses during periods of oil price increases. **(Atieno & Winnie, 2010).**

2.2 The Facts Of International Trade In The Algerian Economy

Algerian exports are dominated by hydrocarbons, which account for 98% of total merchandise exports. In the beginning of the 2000s, hydrocarbon prices increased steadily on the global level; oil rose from an average price of less than $ 20 a barrel in the 1990s, to an average of over $ 50 between 2000 and 2008. This price boom resulted in a significant increase of Algerian export revenue, which went from an average of $ 10 bn in the 1990s to more than $ 20 bn in the first half of the year 2000. In 2008, exports reached the historical height of $ 79 bn.

Fig.1 Development of some macroeconomic variables during the period (2004-2018)
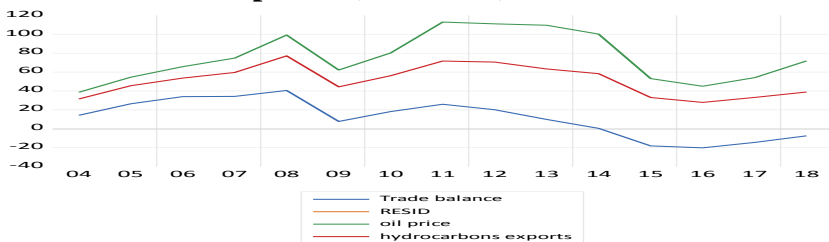
Source: : Prepared by researchers based on **eviews 11** outputs.

Over the same period, imports continued to rise, reaching a record high of $ 58 bn in 2014. The oil counter shock of the second half of 2014 resulted in a fall in Algerian exports to less than $ 35 bn in 2015 and only $ 28 bn in 2016. Algeria's economy recorded in 2015 and in 2016 the largest trade deficits in its history, reaching more than $ 15 bn and $ 17 bn respectively. How to reduce this trade deficit? To face these challenging times, Algerian authorities engaged in a couple of endeavors: export diversification and import reduction. Yet, these two options can only have

results in the medium term. The oil crisis began in the second quarter of 2014, and the 2016 trade deficit was the largest historically. The difficulties of putting these solutions into practice reside, on one hand, in the complexity of promoting non-hydrocarbon exports, and, on the other hand, in the dependence of the Algerian economy vis-a-vis imports. In addition, import reduction can have negative effects on the domestic market, particularly with regard to inflation. The Algerian trade balance is, therefore, completely subject to parameters that are mostly exogenous in nature: the price of hydrocarbons, foreign demand for hydrocarbons, import prices and the fluctuations of the US dollar exchange rate. **(Bensafta, 2018).**

During the period (2014-2018) the trade balance was a decrease in any income in deficit, where it saw a sharp decline in 2015 by 18.08-billion dollars and increased by 2% in 2016, where it declined Exports of hydrocarbons increased by 6% during the same year, and exports outside the hydrocarbon sector decreased by 20%, and the trade deficit increased by $5 billion during 2017 despite the rise in services paid in hard currency and the transfer of profits of foreign enterprises operating in Algeria, as noted by the Central Bank Even though fuel exports declined in volume to 99.9 million tonnes (oil equivalent in 2018, a decrease of 7.7% compared to a year ago, but they nevertheless recorded a 17.2% increase in value in 2017, the source added that this increase was due to a significant increase in oil prices by 32.1% between 2017 and 2018.

3. EXCHANGE RATE MOVEMENTS FOR ALGERIA (ALGERIAN DINAR/USD/EUR)

An exchange rate is the price of a country's currency relative to other currencies. In other words, it is the rate at which one currency can be converted into another currency.

3.1 What is an Exchange Rate?

Nominal exchange rate is defined as the price of a currency in terms of another currency. In parallel, real currency exchange rate should be defined as the price of the currency in real terms. In the literature and textbooks, however, it is defined asthe relative price levels between two countries, rather than how muchthe currency can purchase in real terms.

Some authors may have noted this issue and attempted to define it for currency. Nevertheless, they still end up with the price ratio of the goods between two countries, rather than the exchange rate of currencies. This

paper attempts to provide a formal and naturaldefinition for the realcurrency exchange rate, and to discuss some of itsimplications in international macroeconomics.

The subject in the term"currency exchange rate," nominal or real, should be a currency, anda real variable is converted from its corresponding nominal counterpart after adjustedfor purchasing power. Based on these two principles of economics, we propose to define realcurrencyexchange rate as the nominal exchange rate adjusted for the relative purchasing power. It can also beinterpreted as thepurchasing power of the currencyabroad relative to that at home. In this treatment, the currency is the subject of the exchange rate and it serves as medium of exchange at home as well as abroad. In the conventional definition for the real exchange rate, in contrast, the subject is the relative national prices and the currency only plays a role of unit of accountas the nominal exchange rate merely helps convertdifferent price levels into a common currency. Conceptually, these two treatments are different in the starting point: our definition starts with the nominal exchange rate and hence the subject is currency and exchange, whereas the conventional treatment starts with the ratio of national price levels and hence the subject is the relative cost of living. **(Yang1 & Tong, 2014).**

3.2 Real Exchange rate Determination

The real exchange rate of the oil-exporting economy (Q_t) is defined as the foreign price of a domestic basket of consumption relative to the foreign price of a foreign basket of consumption $Q_t = E_t P_t / P_t^*$, where denotes the foreign economy and E_t is the price of domestic currency. An increase in Q_t hence implies real appreciation. We assume that the domestic and foreign price levels are geometric averages of the prices of traded and non traded goods with weights **1-y** and **y** respectively. We can then write the aggregate price level such that $P_t = P^Y_{N,t}$

$P^{1-Y}_{T,t} = p_{T,t} (P_{N,t}/p_{T,t})^y$

 and the real exchange rate expression can be rewritten as

$$Q_t = E_T P_T/P^*_{T,t} \qquad = \qquad E_T P_{T,t} / \qquad P^*_{T,t} = \left(\frac{PN,\frac{t}{pT},t}{P*N,\frac{t}{P}*T,t} \right)^y$$

where the law of one price is assumed to hold for the tradable good so that $P^*_{T,t} = E_T P_{T,t}$. Next, equations (1) and (5), describing the relative demand and supply of tradable and non-tradable goods, are combined for both the domestic and the foreign economies. **(Rickne, 2009)**

The ideal exchange rate regime is a crucial element in the process of directing economic policies in any country because of its impact on economic performance. It plays a clear role in determining the ability of the economy to face many crises and shocks, whether real or financial, and achieve good growth rates that push the economy forward. The exchange rate regimes are an element of modern financial thinking because they are important in adjusting and settling the balance of payments and maintaining the stability of economic growth rates in developing countries, which are characterized by chronic structural deficit according to the macroeconomic policies in the field of development One of the major indicators of the global economic crisis has been the exchange rate channels. This has manifested itself in Algeria through exchange rate fluctuations, This is illustrated by the following figure:

Fig.2 Exchange Rate Movements For Algeria (Algerian Dinar/USD/EUR) During 2004-2018
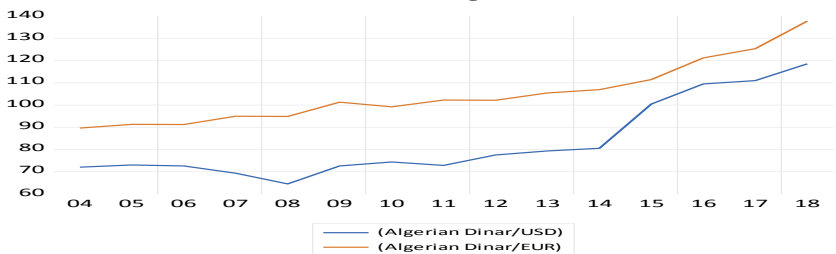
Source : : Prepared by researchers based on **eviews 11** outputs.

The Algerian exchange rate regime is a fixed exchange rate regime until 1994, when at first the Algerian dinar was attached to a single currency, which is the French franc, and then to a basket of currencies. After 1994, Algeria, as part of its transition to a market economy.

The evolution of the exchange rates of the dinar against the dollar and the euro in 2006 reflects both the reduction of the inflation differential with Algeria's main trading partners, and the foreign exchange market conditions of the major currencies. The average price of the dinar against the dollar rose from 73.3627 dinars per dollar in 2005 to 72.6464 dinars per dollar in 2006. In addition, the average dinar/euro price stabilized during 2006, from 91.3014 dinars per euro in 2005 to 91.2447 dinars per euro in 2006.

Regarding the real effective exchange rate at the end of 2008, remained close to equilibrium, with an annual average appreciation of 1.58%3. 2009 also saw the dinar stabilize against the U.S. dollar, with an

annual average of 72.646 dinars per dollar. As for the price of the dinar against the euro, achieving an annual average of 101.2990 dinars/euro. In total, the real effective exchange rate at the end of 2009 remained close to its equilibrium level, with an average depreciation of about 2% compared to an annual average of 1.6% in 2008.

On an annual average, the real effective exchange rate appreciated by 2.64 per cent in 2010, driven by the appreciation of the nominal effective exchange rate of 0.53 per cent and the increase in relative prices of 2.06 per cent. The average annual exchange rate of dinar against the dollar decreased by 2.42% in 2010 compared to 2009.

In a situation of volatility in the exchange rates of major currencies from May 2013, the average annual price of dinar against the U.S. dollar decreased by 2.36%. The average annual exchange rate of the Algerian dinar against the U.S. dollar was USD 79.3809/DZD in 2013 compared to USD 77.5519/DZD in 2012. At the same time, the average annual exchange rate of dinar against the euro depreciated by 3.21% in 2013 compared to 2012, from EUR 102.1627/DZD in 2012 to EUR 105.4374/DZD in 2013. the latter appreciated by 3.37% against the U.S. dollar in 2013 (1.3281 euros/USD in 2013 compared to 1.2848 USD in 2012). The real effective exchange rate of dinar depreciated by an average of 2.34% in 2013 compared to the same period in 2012. However, the real effective exchange rate of the dinar remains appreciated by about 4% at December 2013, compared to its level of equilibrium determined by fundamentals.

By tracking the value of the dinar in recent years, it is clear that the value of the Algerian dinar is moving with a negative indicator that has increased with the beginning of the collapse of oil prices in the world markets in 2014, where the average exchange rate of the dinar against the US dollar for 2015 fell by 20%, keeping the dinar falling against the euro and other currencies.

Although oil prices improved in the first months of 2018 compared to previous years, the value of the Algerian dinar continued to decline against major currencies to record a decline at the end of December 2018 by 7.55% against the US dollar and 12.36% against the euro, and economists expect the currency to continue to decline under the current conditions of stable import volumes, export stagnation, printing of money and rising inflation, as well as the state budget deficit and increased public spending.

4. THE RELATIONSHIP BETWEEN THE OIL PRICES AND EXCHANGE RATES

From the theoretical perspective, several models have been fostered to determine the nature of the relationship between oil prices and exchange rates (Krugman, 1983; Golub, 1983; McGuirk, 1983; Rogoff, 1991). In this, several studies have examined the analysis of the impact of oil price shocks on the exchange rate and found a strong relationship between the two variables (Benassy-Quéré et al., 2007; Chen and Chen (2007); Korhonen et al. (2007); Nikbakht (2009); Lizardo and Mollick (2010); Ferraro, Rogoff, and Rossi (2011); Mehmet Eryigit (2012); Courage and Kin (2014); Nag Upadhayaya and Kaushik (2014); Zhang (2014); Drachal (2018)). The investigation of Benassy-Quéré et al., 2007 used the cointegration model and causality model to determine the relationship between oil prices and the dollar exchange rate for the period 1974-2004. The results showed that the causal relationship extends from oil prices to the exchange rate. In the long term, they found that 10% rise in oil prices would lead to a dollar gain of 4.3%. The researchers predicted that a future inverse relationship between these two variables could arise because of China's entry as a major consumer of oil. Chen and Chen (2007) verified the nature of the long-term relationship between the exchange rate and oil prices using monthly data for Panel data during 1972: Q1 - 2005: Q10 for the G7 Countries. Their study indicated that there was cointegration between exchange rates and real oil prices. The results showed that oil prices are the dominant variable of real exchange rate changes and found that using oil prices, exchange rates can be predicted and then yields can be generated through these forecasts. Korhonen et al. (2007) estimated the real exchange rate in OPEC countries from 1975 to 2005 and three oil-producing Commonwealth Independent States (CIS) from 1993 to 2005 using panel co-integration methods. Their results show that real oil price has a direct effect on the equilibrium exchange rate in oil-producing countries. Nikbakht (2009) studied the long-run relationship between real oil prices and real exchange rates from 2000:01 to 2007:12 by using monthly panel of seven OPEC countries (Algeria, Indonesia, Iran, Kuwait, Nigeria, Saudi Arabia, and Venezuela). His results show that there is a long-run and positive linkage between real oil prices and real exchange rates in OPEC countries. Lizardo and Mollick

(2010) investigated the cointegration relationship between oil prices and exchange rates. **(Djebbouri, 2018).**

The sudden and sharp decline in oil prices presents important challenges for macroeconomic performance and financial stability in Algeria. Algeria's economy is highly dependent on hydrocarbons for growth, budget revenues, and exports. The nonhydrocarbon sector, consisting largely of industry and services, is driven by public spending financed by hydrocarbons revenues, and therefore its performance is also highly correlated with oil prices. The collapse in oil prices has exacerbated an already unsustainable fiscal position and swung once-comfortable current account surpluses into deep deficit.

The oil price shock also poses challenges for macroeconomic policy formulation. Given the size and likely duration of the oil price shock, maintaining current high levels of fiscal spending would cause a considerable widening of the budget and current account deficits and a rapid depletion of fiscal savings and international reserves. The adjustment to the shock will require a reduction in domestic absorption that, for the time being, can mainly be achieved by tightening the fiscal stance. However, this will reduce growth given the high dependency of the economy on fiscal spending, although Algeria could shape fiscal adjustment in a gradual manner thanks to its sizeable fiscal and external buffers. To reduce the impact on growth, the fiscal adjustment should be supported by a well-designed monetary policy, which will soon be able to rely on short-term interest rates as a policy instrument once excess liquidity gives way to structural shortages, as well as an appropriate exchange rate policy**. (IMF, 2016).**

5. THE ECONOMETRIC STUDY OF THE IMPACT OF FLUCTUATIONS IN OIL PRICES ON THE ALGERIAN DINAR EXCHANGE RATE

5.1 Practical approach: (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.

5.2 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).**

5.3 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 price of oil estimated in US dollars, which is symbolized by (OP), the impact of The impact of oil price changes on the exchange rate of the Algerian dinar during the period from 2004 to 2018, and 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(OP ,M2)……………(1)

Or in other terms: **NER = a+b1 OP+b2 M2+ε_i………………(2)**

Where:

M2: Monetary mass; **NER**: Algerian dinar exchange rate against THE US dollar; **OP**: apriceof oil; **a**: constant; **b**: the slope that determines the relationship between the two variables; ε_i: random error.

Fig 3. Graph of eveiwse outputs for the evolution of study variables (NER-OP -M2) for the period 2004-2018
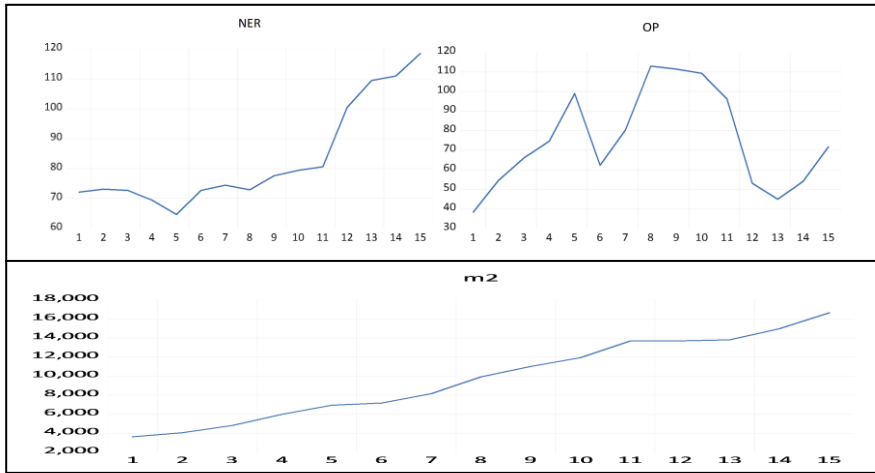
Source: Prepared by researchers based on **eviews 11** outputs.

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

Dependent Variable: NER
Method: Least Squares
Date: 09/10/20   Time: 21:44
Sample: 1 15
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	0.003678	0.000305	12.07202	0.0000
OP	-0.348488	0.051619	-6.751189	0.0000
C	73.54078	4.711230	15.60968	0.0000

R-squared	0.934607	Mean dependent var		83.23000
Adjusted R-squared	0.923708	S.D. dependent var		17.38613
S.E. of regression	4.802225	Akaike info criterion		6.152892
Sum squared resid	276.7364	Schwarz criterion		6.294502
Log likelihood	-43.14669	Hannan-Quinn criter.		6.151384
F-statistic	85.75269	Durbin-Watson stat		1.171227
Prob(F-statistic)	0.000000			

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

Estimate Equationm: **NER = - 0.348488*OP + 0.003678* M2 + 73.54078**

5.4 Statistical study of the model

- **Selection factor:** Estimated at **0.934607** or **93.46%** and corrected selection coefficient estimated at **(0.923708) or (92.37%).**

- **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 **(85.75269)** 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 **(12.07202)** is greater than the table value **(2.160)** at **15** 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.

- **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

Table 3. Breusch-Pagan-Godfrey Test Results

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

F-statistic	1.366549	Prob. F(2,12)	0.2920
Obs*R-squared	2.782611	Prob. Chi-Square(2)	0.2488
Scaled explained SS	2.123946	Prob. Chi-Square(2)	0.3458

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 09/10/20   Time: 22:48
Sample: 1 15
Included observations: 15

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-10.27934	28.20564	-0.364443	0.7219
M2	0.002990	0.001824	1.639020	0.1271
OP	-0.006349	0.309036	-0.020543	0.9839

R-squared	0.185507	Mean dependent var	18.44909
Adjusted R-squared	0.049759	S.D. dependent var	29.49355

S.E. of regression	28.75041	Akaike info criterion	9.732038
Sum squared resid	9919.034	Schwarz criterion	9.873648
Log likelihood	-69.99028	Hannan-Quinn criter.	9.730529
F-statistic	1.366549	Durbin-Watson stat	2.166488
Prob(F-statistic)	0.291960		

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

The statistical value **X2= R2*N**,or **X2=0.185507*15 =3.67999**, with a probability of **P=0.2488** 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 4.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	1.394474	Prob. F(2,10)	0.2923
Obs*R-squared	3.271123	Prob. Chi-Square(2)	0.1948

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 09/10/20   Time: 22:07
Sample: 1 15
Included observations: 15
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
M2	1.41E-05	0.000327	0.043174	0.9664
OP	-0.008028	0.056502	-0.142083	0.8898
C	0.505570	4.658246	0.108532	0.9157
RESID(-1)	0.529333	0.374861	1.412077	0.1883
RESID(-2)	-0.407526	0.381421	-1.068442	0.3104
R-squared	0.218075	Mean dependent var		2.38E-14
Adjusted R-squared	-0.094695	S.D. dependent var		4.445996

| S.E. of regression	4.651743	Akaike info criterion	6.173563
Sum squared resid	216.3871	Schwarz criterion	6.409579
Log likelihood	-41.30172	Hannan-Quinn criter.	6.171048
F-statistic	0.697237	Durbin-Watson stat	1.971449
Prob(F-statistic)	0.611012		

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 = **3.271123** 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 4.Jarque-Bera test results
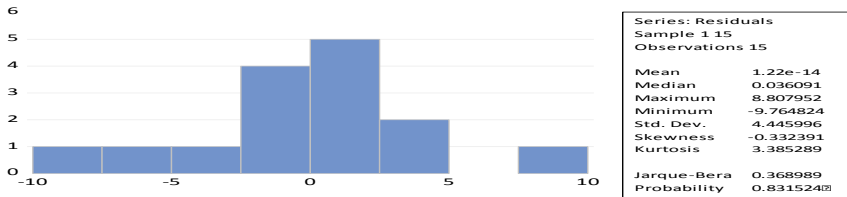
Source: Prepared by researchers based on **eviews 11** outputs

Since the value of **Jarque-Bera= 0.368989** 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.

1.   **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 5.Curve of actual and estimated model values during the period (2004-2018)
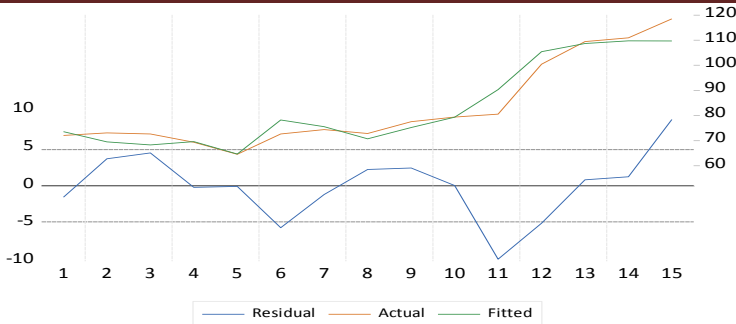
Source: Prepared by researchers based on **eviews 11** outputs

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

6. Conclusion

Oil is crucial to the Algerian economy. Given the impact it might have on economic variables, we have proposed an empirical analysis of the relationship oil prices - exchange rate.

This study examined the causal effects of oil price on exchange rate in Algeria. Further, this investigation was due to the result of the strong correlation of the Algerian economy that is often influenced with the successive shocks of the oil prices that led the last oil crisis and the financial crisis as well, with the sector of hydrocarbon. Thus, since 2014 Algeria has been suffering from a severe crisis. And due this, Algeria becomes too vulnerable to a sharp and worrisome deterioration in the dinar exchange rate against the US dollar at a time when the country's revenues from dollars appear to be falling steadily. Thus, if the situation is not controlled and an atmosphere of confidence is not created in the economy, the country may face many repercussions in the future, the most important of which are the deterioration of the purchasing power of the currency, the risk of increasing inflation, the deterioration of the balance of payments position and the decline in foreign exchange reserves in light of the general scarcity of foreign exchange in the necessary expenditure on the development projects.

therefore the most important recommendations that could be suggested are the attempt toward realizing more flexible exchange rate through the quantitative models depending on the economic indicators which have a direct impact on it and the farness from the administrative decisions for determining the exchange rate in addition to the rise the

productive power of the local economy in all sectors in order to rise the national production and diversify it without depending only on hydrocarbons which represents more than 90% of the Algerian exports that are mostly oriented toward USA and Europe in order to boost the forming of foreign exchange reserves and their uses in the monetary policy management, and also to maintain the stability of the exchange rate according to the economic data.

Moreover, The results showed that the decline in crude oil prices had a strong impact on the decline in the exchange rate in the periods of the study. In addition, the negative oil price shocks adversely affected monetary mass and balance of trade balance.

In conclusion, the continued fall in the oil price calls for a programme of far-reaching reforms in order to rationalize public spending without slowing down the momentum of growth and public investment. In the short term, Algeria is protected from a balance of payments crisis, but unless it can quickly bring public finances under control and diversify its economy, the country could face a crisis on a larger scale. The question of reform raises the issue of governance, notably to improve capacities to steer economic reform and its implementation and Control of cash issuance and monetary mass control, Diversification of the Algerian economy and support the engines of economic growth, especially in the agriculture and industrial sector; tourism and the promotion of the expansion of small, medium and emerging enterprises, Moving towards the development of renewable energies and adopting them as an alternative to traditional hydrocarbons.

8. BIBLIOGRAPHY LIST

1.   (2019). Consulté le 09 01, 2020, sur www.marefa.org.

2.   Al-Sawai, K. M. (2011). *The basics of the econometric using Eviewse.* jordon: Cultural Book House.

3.   Atieno, R., & Winnie, V. (2010). Migration labour markets and development: The global economic crisis and its impact on the economy, labour markets, migration and development in North and West Africa.

4.   *RESEARCHE   PROJET   MAKING   MIGRATION   A DEVELOPEMENT*

5.   *FACTOR: THE CASE OF NORTH AND WEST AFRICA* , 09.

6.   Bensafta, K. M. (2018). US Dollar Dynamics and it Impacts on Algeria Imports from the Eurozone. *HAL ARCHIVES-OUVERTES* , 02.

7.   Djebbouri, M. (2018). Impact of Oil Price Shocks on Exchange Rate in Algeria. *International Journal Of Finance And Accouting , 7* (5), 134.

8.   IMF. (2016). *ALGERIA SELECTED ISSUES.* The Middle East and Central Asia Departmen tFund, International Monetary.

9.   izraf, M., & Aziz, A. (2009). Oil Price & Exchange Rate: A Comparative Study between Net Oil Exporting and Net Oil Importing Countries. *Lancaster University* , 7.

10.   Rickne, J. (2009). Oil Prices and Real Exchange Rate Movements in Oil-Exporting Countries: The Role of Institutions. *Research Institute Of Industrial Economics* (810), 10-11.

11.   Yang1, B. Z., & Tong, Z. (2014). A Note on the Real Currency Exchange Rate: Definitions and Implications. *Journal Of*

12.   *International Business And Economie , 02* (04), 46.