STRATEGY AND DEVELOPMENT REVIEW
Approved Scientific International Review
Specializing in the economic field
Edited by the Faculty of Economics, Trade and Management Sciences University of Mostaganem, Algeria

ISSN: 2170-0982 / E-ISSN: 2600-6839 / ISBN: 2011-4793 / Class: C

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Address: Strategy And Development Review, Faculty of Economics – Kharouba city, Mostaganem University, W- Mostaganem 27000 , Algeria
E-mail: strg.devp@gmail.com
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January 2019, Volume 9, Number 16

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

mouhcene HAMRIT [1], Sabrina MANAA[2]

[1] University abbes laghrou khenchela, (Hamritm@gmail.com)

[2] University abbes laghrou khenchela, (assilsabrina048@gmail.com)

Received: 10/07/2018 **Accepted:** 26/12/2018 **Published:** 23/01/2019

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.

Corresponding author: Sabrina Manaa, **e-mail**: assilsabrina048@gmail.com

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 ε_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 $f(t) = c0 + c1t$

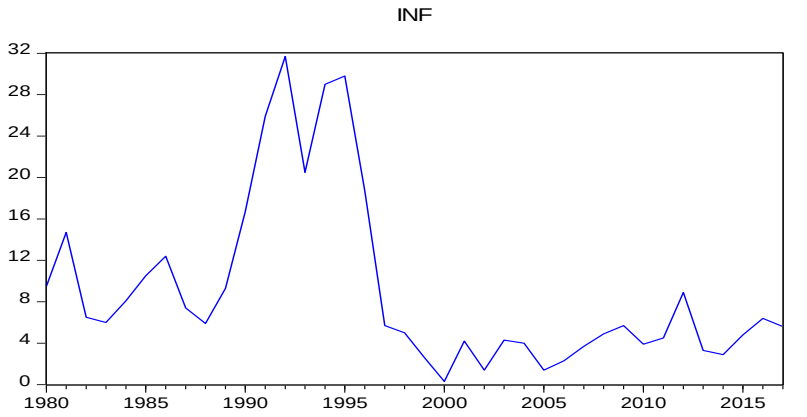
4. The Data

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).

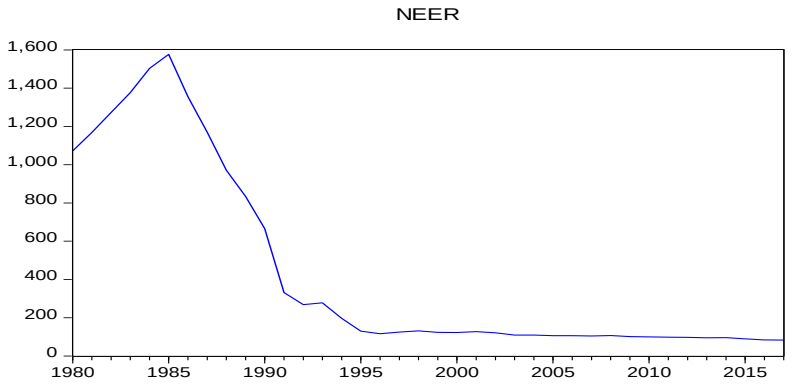
The series for inflation, nominal effective exchange rate and real effective exchange rate are presented in the figure1, 2 and 3 respectively.

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



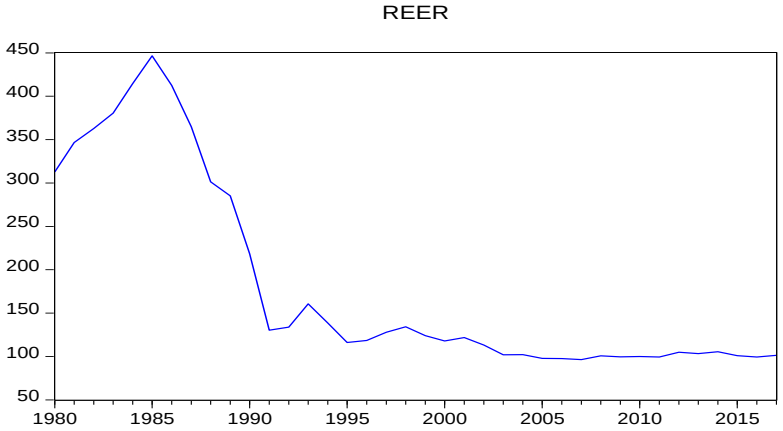
Source: international financial statistics

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 **Lag length:3 (Automatic-based on AIC, maxlag=4)**		
	T stat	**Prob**
Augmented Dickey-Fuller test statistics	-2.6531	0.0927

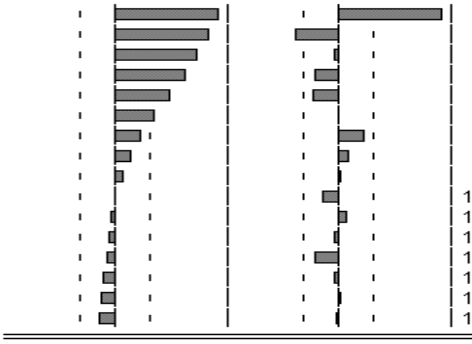
Source: Eviews 10 output

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***
		***	***

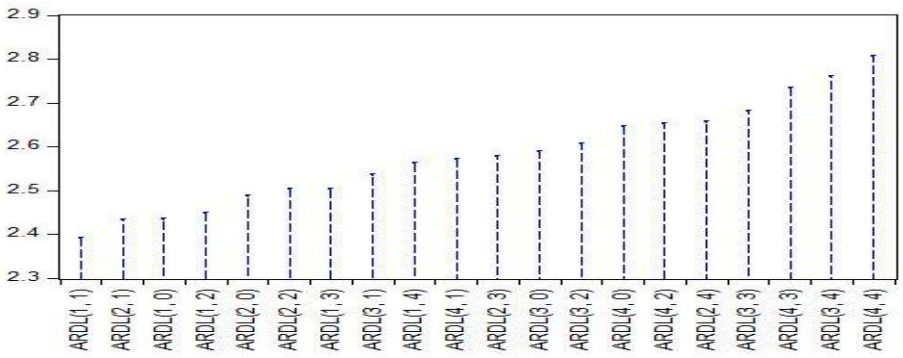
Source: Eviews 10 output

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

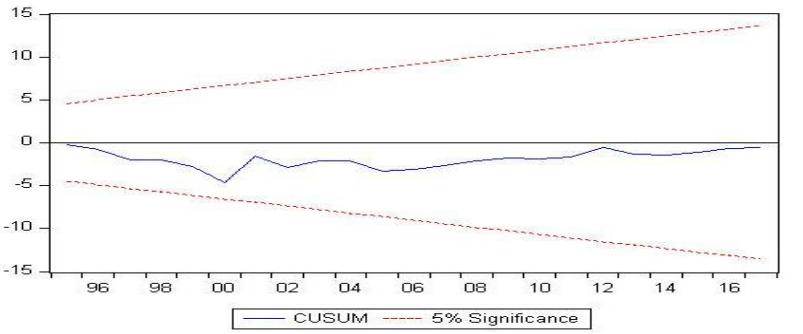
Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(LOG_NEER)	-1.043398	0.705095	-1.479797	0.1487
DUMMY	0.770442	0.243904	3.158795	0.0034
CointEq(-1)*	-0.557412	0.133510	-4.175068	0.0002

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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The role of companies' growth analysis in evaluating their financial performance: with a case study

ENNEMRI Nasreddine
University of Boumerdes, (nemrinasreddine@gmail.com)

Received: 04/09/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Abstract

This research has a great importance since it illustrates how to evaluate the financial performance by focusing on the main indicators issued from growth analysis. The research investigated tow companies working in Algeria which are: EL-AURASSI hotel and NCR ROUIBA specialized in juice production.

The main findings of the research prove that the difference of the performance realized by the tow companies is mainly due to the difference of the compatibility that should be kept between the value of capital employed and the volume of sales.

Keywords: growth; performance; financial performance; performance evaluation; growth analysis.

JEL Classification Codes: G39, L25.

ملخص

يعتبر هذا البحث هام لأنه يسلط الضوء على كيفية تقييم الأداء المالي بالاعتماد على مجموعة من المؤشرات التي لها علاقة بتحليل نمو المؤسسة. وقد ركز البحث على مؤسستين ناشطتين في الجزائر هما: فندق الأوراسي ومؤسسة مشروبات رويبة.

وتؤكد أهم النتائج التي توصل إليها البحث أن التفاوت في أداء الشركتين إنما يعود بالدرجة الأولى إلى اختلافهما في إحداث التوازن المطلوب بين قيمة الأموال المستثمرة من قبلهما وحجم رقم الأعمال المحقق.

كلمات مفتاحية: نمو، أداء، أداء مالي، تقييم الأداء، تحليل النمو.

Corresponding author: Nasreddine ENNEMRI, **e-mail**: nemrinasreddine@gmail.com.

1. INTRODUCTION

The world economy is characterized currently by many developments among them are: digital progression, globalization, market expansion…, etc. These developments have obliged a lot of economic companies to change their management system. In fact, several economic companies have started to implement some strategies aiming to improve their performance in order to achieve suitable growth rates, knowing that such suitable rates should be equivalent to the growth pattern realized at the market where they supply their products.

Indeed, growth is an opportunity and a great challenge for all the economic companies because it is a way of creating financial surplus. It is a very hard and complicated strategic path owing to the fact that it can not be a source of financial surplus without having a strong administration able to clarify all the factors of creating wealth. This administration should have as well good skills in order to determine the best management tools aiming to illustrate how to conduct the financing resources owned by the company and, as a result, take the right decisions to conduct the growth into the creation of financial surplus.

Also, the internal growth rate is a very important tool that can be used in order to conduct growth strategies. So it can clarify several aspects that should be taken into consideration by the company to generate financial surplus. In addition, this rate is able to be divided into many indicators explaining the manner of creating wealth because it is related to several variables of financial policies, production policies and commercial policies, which represent the key elements of creating wealth. It contains as well a lot of indicators that can be used to evaluate the financial performance such as: return on equity, return on capital employed…, etc.

This research aims to diagnose the variables that can be controlled by the company in order to create financial surplus by illustrating the different variables related to the internal growth rate. As well, the research aims to investigate the relationship between the indicators issued from that rate and the objective concerning the creation of financial surplus using the financial

statements of tow companies working in Algeria which are: EL AURASSI hotel and NCR ROUIBA.

1.1. Problematic of the research:

The research tried to treat the following problematic:

- Are the indicators issued from the analysis of the internal growth rate able to clarify the path that should be taken by the economic company in order to create financial surplus?

1.2. Importance of the research:

The importance of the research especially appears at the current time because the economic company can ensure its life by achieving, at least, equivalent growth rates to the rate realized by the other companies working against it. For this reason, the research tried to analyze the internal growth rate in order to determine how the economic company can transform its growth into an adequate level of financial surplus, which is very important to be generated to improve the position of the company at the market where it works.

1.3. Literature review:

Many ratios and indicators are useful to evaluate the ability of economic companies to conduct their growth strategies in hope of creating financial surplus. Among them are the upcoming indicators:

1.3.1. Return on equity: this indicator represents the relationship between net profit and equity. It describes the volume of profit gotten by just only one unity of equity employed by the company. It can be calculated as fallows **(Barreau & Delahaye, 2001)**:

$$RF = \frac{R_{net}}{FP}$$

Knowing that: RF : return on equity, R_{net} : net profit, FP : equity.

This ratio can be divided into three other ratios as it is presented by the following equation **(Evraert, 1991)**:

$$RF = \frac{R_{net}}{CA} \cdot \frac{CA}{CI} \cdot \frac{CI}{FP}$$

Knowing that: CA : sales, CI : capital employed.

This equation shows that return on equity contains three variables which are:

- Net profit margin $\frac{R_{net}}{CA}$: this ratio reflects the volume of net profit for every one dinar of sales.

- Capital employed turnover $\frac{CA}{CI}$: this ratio evaluate whether the company has succeeded to use its assets.

- Debt ratio $\frac{CI}{FP}$: this ratio shows whether the company is dependent in financing its assets.

1.3.2. Financial leverage: financial leverage represents the effect of debt on return on equity. It can be described using the following equation **(Vernimmen, 2014)**:

$$RF = [RE + (RE - i)D / FP](1 - T)$$

Knowing that: RE : return on capital employed, T : taxes rate, D : long run debt, i : interest rate.

This equation illustrates that the effect of financial leverage can be positive if return on capital employed is above interest rate. For this reason, the return on capital employed is considered as an indicator of financial surplus. Also, it can be divided as fallows (using DuPont analysis manner):

$$RE = \frac{R_{\exp}}{CA} * \frac{CA}{CI}$$

$R_{\exp}$: operating result, $\frac{R_{\exp}}{CA}$: operating margin rate, $\frac{CA}{CI}$: capital employed turnover.

1.3.3. Internal growth rate: the internal growth rate is calculated by return on equity multiplied by retention rate **(Vernimmen, 2014).**It can be presented as will by the following equation **(Hoarrau, 2008)**:

$$g = RF = (1 - I)\left[RE + \frac{D}{FP}(RE - i)(1 - d) \right]$$

Knowing that: d : dividend rate, g : internal growth rate.

This equation proves that the economic company can finance its growth using a part of its net profit. Thus, it can enhance its growth using an adequate value of debt if return on capital employed is expected to be above the interest rate.

2. Method:

The purpose of this study is to determine whether the ratios issued from the analysis of internal growth are able to clarify the path that should be taken by the economic company in order to create wealth and to improve its own financing sources. The study based on tow companies listed in the Algerian stock exchange over the period 2011-2016. These companies are: EL AURASSI hotel and NCR ROUIBA specialized in juice production.

2.1. Variables of the research:

The main variables of the research are the principal indicators issued from the analysis of internal growth which represent the different factors affecting the value of return on equity. So, the last ratio represents the main indicator aiming to evaluate the ability of the tow companies to transform the financing sources used to finance its growth into financial surplus. Also, the research used some indicators else to take into consideration the impact of the factors that can not be obtained from growth analysis on the ability of the companies to create added values.

The next table illustrates the different indicators used in the research as well as the ratios by which they can be calculated:

Table 1. Variables of the research

Sym	Ratio name	Equation
V1	Return on capital employed	Operating profit/capital employed
V2	Gross margin ratio	Net profit/ global operating surplus
V3	Capital employed turnover	Sales/capital employed
V4	Operating margin ratio	global operating surplus/sales
V5	Economic margin ratio	Operating profit/sales
V6	Net profit margin	Net profit/sales
V7	Long debt turnover	Sales/long dept
V8	Equity turnover	Sales/equity
V9	Debt ratio	Long dept/equity
V10	financial independence ratio	Equity/capital employed
V11	Return on equity	Net profit/equity
SP	Share prices	Transaction value/ volume of transaction
Com	1: EL Aurassi hotel 2: NCR-ROUIBA	This variable represents the tow studied companies

Source: prepared by the researcher

From the table, the indicators can be classified as follows:

- 1st group: this group contains the ratios having a relation with the financial structure which are: debt ratio and the ratio of financial independence.

- 2nd group: this group contains the ratios of activity which measure the ability of the company to use its assets in order to improve its volume of sales. The ratios of this group are: equity turnover, long debt turnover as well as capital employed turnover.

- 3rd group: this group contains the ratios of profitability which are: economic margin ratio, gross margin ratio, return on capital employed.

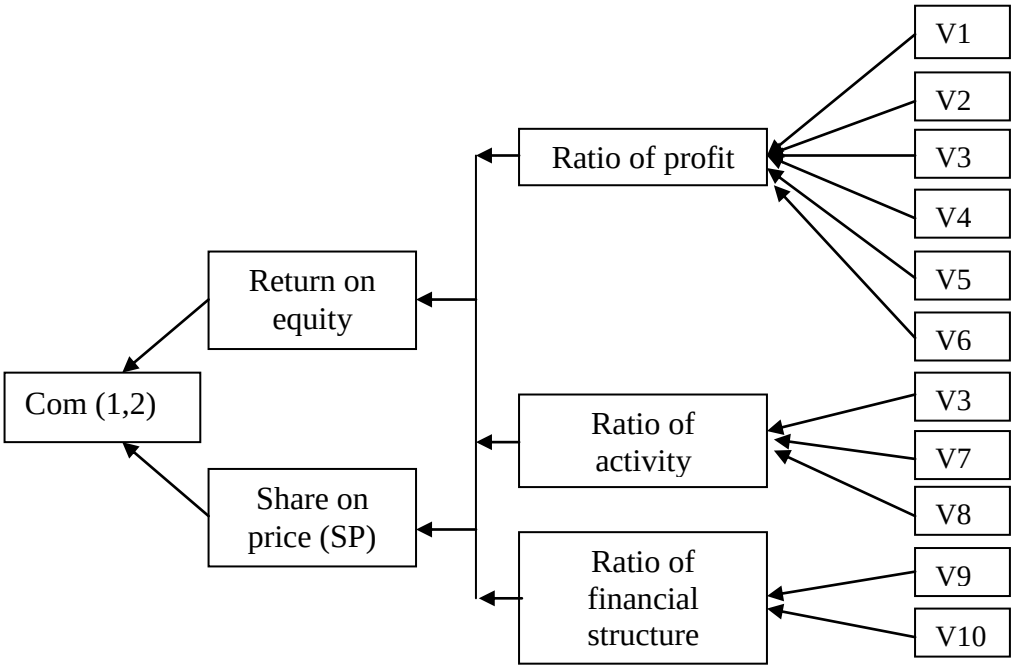
2.2. Research data:

The data of the research has been obtained from the financial statements of the tow companies covering the period 2002-2016. As well, the researcher used some reports published by the Algerian stock exchange market to complete the data.

2.3. Model of the research:

First of all, the research tried to investigate the relationship between return on equity, which has been used as a dependent variable, and all the other ratios which have been used as independent variables. Then, the research tried to investigate the difference between the tow companies in order to determine whether there is a fluctuation from a company to another concerning the value of each variable.

Figure 1. Model of the research



Source: prepared by the researcher

From the figure, the main hypotheses of the research can be established as follows:

H_1 : There is a significant difference between the tow companies concerning the value of the ratios of financial structure, the ratios of activity as well as the ratios of profitability.

H_0 : There is not a significant difference between the tow companies concerning the value of the ratios of financial structure, the ratios of activity as well as the ratios of profitability.

3. Results and discussion:

Using the upcoming statistical tools, the data of the research has been analyzed as fallows:

3.1. Ratios progression:

The progression of the ratios of each company is given thanks the tow following tables:

3.1.1. EL AURASSI: the ratios of EL AURASSI hotel studied is presented in the following table:

Table 2. The results of the variables of the research (EL-AURASSI)

V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
-0.06	-1.35	0.01	-3.96	-5.64	-5.37	0.017	0.032	1.86	0.349	-0.17
0.539	0.76	1.18	0.46	0.455	0.35	0.228	0.392	1.71	0.368	0.139
0.043	0.316	0.206	0.51	0.208	0.164	0.319	0.584	1.82	0.353	0.096
0.092	0.423	0.296	0.566	0.31	0.24	0.476	0.78	1.63	0.378	0.187
0.073	0.38	0.267	0.552	0.27	0.212	0.46	0.623	1.32	0.429	0.132
0.05	0.242	0.259	0.514	0.192	0.124	0.471	0.578	1.22	0.449	0.072

Source: from SPSS using the research data

The table shows that all the ratios of profitability which are: return on capital employed (v1), gross margin ratio (v2), operating margin ratio (v5), net profit margin (v6) recorded during the period studied by the researcher knew a little fluctuation from a year to another. This fluctuation is due to the variation of the value of capital employed turnover (v3), long debt turnover (v7) and equity turnover (v8) which means that there is a little incompatibility between the value of sales and the assets allocated by the company in order to achieve the targeted sales. The table shows as well that

the value of debt decreased a little bit and the ratio of financial independence increased, proving that the company decided to reduce its debt in comparison with its equity.

3.1.2NRC ROUIBA: this company achieved a performance that can be evaluated by the following ratios:

Table 3. The results of the variables of the research (NRC-ROUIBA)

V1	*V2*	*V3*	*V4*	*V5*	*V6*	*V7*	*V8*	*V9*	*V10*	*V11*
0.155	0.278	2.055	0.141	0.075	0.039	5.621	3.239	0.576	0.634	0.127
0.14	0.218	2.417	0.132	0.057	0.028	7.04	3.68	0.522	0.656	0.106
0.117	0.29	1.85	0.128	0.063	0.037	4.01	3.445	0.858	0.538	0.13
0.097	0.303	1.511	0.146	0.0644	0.044	2.627	3.55	1.353	0.424	0.156
0.084	0.182	1.453	0.135	0.0581	0.025	2.413	3.65	1.513	0.397	0.0913
0.063	0.131	1.6	0.124	0.0396	0.016	2.74	3.86	1.41	0.414	0.063

Source: from SPSS using the research data

The table illustrates that despite the decrease of the value of return on capital employed, the other ratios of profitability (gross margin ratio (v2), operating margin ratio (v4), economic margin ratio (v5), net profit margin (v6)) proves that there is a fluctuation in their values, which means that the company recorded a fluctuation in the values of several elements of its income statement.

In addition, the ratio of long debt turnover and the ratio of equity turnover show the decrease of sales in comparison with the increase of the debt used by the company which is proven as well by the ratio of debt (v9) and the ratio of financial independence.

Moreover, the table shows that the company tried to reduce its debt in 2016 in order to correct its situation since in this year the debt increased as it is proven by long debt turnover (v7), debt ratio (v9) and financial independence ratio (v10).

In general, the most important idea provided by this analysis, which is based on the description of the calculated ratios issued from growth analysis, shows that the performance of the tow companies is different a little bit between each other owing to the fact that each company has its own structure of assets and liabilities.

3.2. Test of normality:

To determine whether the variables are suitable to examine the hypotheses of the research, the researcher used Shapiro-Wilk" for concluding that they fallow normal distribution or not, knowing that such conclusion has a direct impact on the adequate statistical test. The results are as follows:

Table 4. Test for normality results.

Variables	Com	Shapiro-Wilk		
		Statistic	df	Sig.
v1	1	,730	6	,013
	2	1,000	4	1,000
v2	1	,718	6	,009
	2	,884	4	,354
v3	1	,720	6	,010
	2	,900	4	,429
v4	1	,515	6	,000
	2	,951	4	,724
v5	1	,534	6	,000
	2	,812	4	,126
v6	1	,530	6	,000
	2	,970	4	,842
v7	1	,848	6	,151
	2	,799	4	,100
v8	1	,885	6	,292
	2	,971	4	,845
v9	1	,889	6	,311
	2	,830	4	,168
v10	1	,866	6	,209
	2	,787	4	,081
v11	1	,782	6	,040
	2	,975	4	,874
PS	1	,883	6	,282
	2	,876	4	,321

Source: from SPSS using the research data

The table illustrates all the variables following normal distribution since the null hypothesis of no normal distribution exists; should be rejected for these variables because P-value (sig in the table) is above 0.05.

3.3. Pearson correlation:

In order to determine the nature of the relationship that exists between return on equity (v11), share price (SP) and all the independent variables, the researcher used Pearson correlation like it is presented in the following table:

Table 5. Pearson results.

		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11	SP
V11	PE	,461	,945**	,343	,927**	,934**	,934**	,235	,287	-,325	,258	1	-,283
	SIG	,132	,000	,275	,000	,000	,000	,463	,366	,303	,419		,428
	N	12	12	12	12	12	12	12	12	12	12	12	10
SP	PE	,062	-,276	-,581	-,350	-,394	-,401	-,587	-,706*	,041	-,032	-,283	1
	SIG	,865	,440	,078	,322	,260	,251	,074	,023	,911	,930	,428	
	N	10	10	10	10	10	10	10	10	10	10	10	10

Source: from SPSS using the research data

The table provides evidence that there is a significant correlation between return on equity (v11), gross margin ratio (v2), operating margin ratio (v4), economic margin ratio (5) and net profit margin (v6). Such results are very normal because they represent the ratios of profit taking part of return on equity, but the correlation of all these ratios, including return on equity, with share price is not significant which means that the internal performance didn't reflect the external performance gotten by the tow companies at the Algerian financial stock market.

Also, the table shows that there is not a significant correlation between return on equity, return on capital employed (v1), capital employed turnover (v3), long debt turnover (v7) and equity turnover (v8). This situation may reveal that the volume of investment at one of the tow companies is not suitable with their volume of sales, because the common points between all these variables are capital employed and sales. Moreover, the results illustrates that debt ratio (v9) and the ratio of financial independence don't have a significant correlation with return on equity, which means, probably, that there is a difference between the tow companies in term of choosing the suitable financial structure.

3.3.3. Statistical comparison between the tow companies:

From the previous analysis the researcher try to determine the correlation between return on equity and the deferent variables of the research in order to evaluate the performance of the tow companies at the same time. From that analysis, the correlation is weak and insignificant with many financial ratios such as: return on capital employed (v1), capital employed turnover (v3), long debt turnover (v7), equity turnover (v8)…, etc. These results disagree with what it has theoretically been proven. For this reason the comparison between the tow companies may reveal why such disagreement has so far been revealed.

The results of the comparison between the tow companies using independent sample t-test are presented in the following table:

Table 6. Independence t-test results

Variables		F	Sig.	Df	Sig. (2-tailed)
v1	Equal variances assumed	3,405	,095	10	,883
	Equal variances not assumed			5,267	,886
v2	Equal variances assumed	4,292	,065	10	,738
	Equal variances not assumed			5,084	,745
v3	Equal variances assumed	,027	,872	10	,000
	Equal variances not assumed			9,905	,000
v4	Equal variances assumed	6,181	,032	10	,640
	Equal variances not assumed			5,000	,650

v5	Equal variances assumed	6,169	,032	10	,460
	Equal variances not assumed			5,000	,477
v6	Equal variances assumed	6,166	,032	10	,443
	Equal variances not assumed			5,000	,460
v7	Equal variances assumed	12,930	,005	10	,001
	Equal variances not assumed			5,093	,004
v8	Equal variances assumed	,152	,705	10	,000
	Equal variances not assumed			9,641	,000
v9	Equal variances assumed	5,817	,037	10	,025
	Equal variances not assumed			8,190	,029
v10	Equal variances assumed	12,692	,005	10	,034
	Equal variances not assumed			6,272	,048
v11	Equal variances assumed	2,519	,144	10	,509
	Equal variances not assumed			5,636	,520
SP	Equal variances assumed	,072	,795	8	,039
	Equal variances not assumed			7,598	,033

Source: from SPSS using the research data

The table provides evidence the previous analysis mentioning that there is a difference between the tow companies in terms of the value of all the ratios which didn't have a significant relationship with return on equity. In fact, the table illustrates that P-value (Sig. (2-tailed) in the table) is less than 0.05 for capital employed turnover (v3), long debt turnover (v7) and equity turnover (v8), debt ratio (v9) as well as the ratio of financial independence. This proven difference reveals that the tow companies didn't succeeded to get the optimum level between the volume of sales and their capital employed but by a different degree between these tow companies.

Regardless whether the tow companies are not similar between each other in terms of their activities; since the first one is providing services, and the second one is a production company, they are competitor to each other because both are listed in the Algerian stock market, which means that each one should try to provide for the investors a higher level of profit in order to keep and improve its share prices. For this reason, it is critical to study the relationship between the previous ratios and share price (SP in the previous table) in order to determine the ratios to focus on in hope of

improving share prices in the financial market. Furthermore, since PEARSON correlation showed that there is not a significant correlation between nearly all the ratios and SP, and independence t-test proved the difference between the tow companies concerning SP, the researcher concluded that the difference between the tow companies, in term of how to determine and keep the best amount of the previous ratios, has been determinant for the performance of each company.

4. Conclusion:

The internal growth rate is a global indicator to determine how to conduct growth strategies. Indeed, it can reveal many aspects that should be taken into consideration by the company in order to create financial surplus. So, this indicator may show the main factors of creating added values, owing to the fact that it is related to many variables of production, financial and commercial policies. As well, it is related to many indicators such is: return on capital employed, operating margin ratio, capital employed turnover and return on equity.

Additionally, the Return on equity is a very important indicator for analyzing and conducting companies' growth into the creation of financial added values. So, this indicator can be analyzed into several variables representing the different factors determining, in turn, how to create profit. Also, this indicator should be analyzed in order to determine how can some variables such as: debt ratio, the ratio of financial independence, capital employed turnover, long debt turnover, equity turnover …, ect, affect the value of return on equity. Indeed, this research revealed that according to the difference recorded in the value of all those indicators between the tow companies, the performance was difference because these companies had had a different level concerning the best coordination between the volume of sales and the capital employed by each company, knowing that the growth of capital employed should be accompanied by an adequate increase of sales in order to cover all the fixed costs related to the capital employed.

Moreover, this research illustrated several results, the most important of them are:

- Despite that there are many indicators to evaluate the ability of creating financial surplus; the internal growth rate represents the main indicator owing to the fact that it reflects many factors influencing the purpose of creating financial surplus. Also, return on equity is considered as a very important indicator to evaluate the impact of internal growth on financial surplus.

- This study illustrated that there is a huge coordination between return on equity and several indicators evaluating the efficient of internal growth such as: gross margin ratio, operating margin ratio, economic margin ratio and net profit margin. This coordination has been revealed when the researcher tried to use the indicators, issued from the internal growth rate, to evaluate the performance of EL AURASSI hotel and NCR ROUIBA. In fact, the results show the importance of such indicators and their role in evaluating the financial performance.

- The weak correlation of return on equity and return on capital employed, capital employed turnover, long debt turnover, equity turnover, debt ratio, financial independence ratio proves that implementing a good coordination between the volume of sales and the amount of capital is among the crucial factors, which can improve the value of return on equity because the common points between all the previous indicators are: sales and capital employed.

- The comparison between the tow companies using independence t-test proves the previous results, because the difference between the amounts of return on equity of the tow companies is related to the difference between them in terms of getting the best coordination between the volume of sales and the amount of capital employed.

Also, some recommendations are crucial to be given for other researchers as well as the companies working in Algeria. These recommendations are as follows:

- It is critical for any company to determine the optimal growth level that should be determined by taking into consideration the financial abilities of the company.

- Growth strategies must be translated into clear goals that should be, in turn, controlled by the indicators related to the analysis of the internal growth rate.
- It is crucial as well to focus on all the factors revealed, thanks the analysis of internal growth, by implementing the practices aiming to improve operating margin and capital employed turnover.
- Estimating the reasonable level of financial independence is among the critical factors of success. For this reason, it is worthy to determine the optimal financial structure in order to enhance the flexibility of the company to take its decisions.
- In order to be able to figure out the anomalies, the company should study the relationship between return on equity and the other indicators related to the analysis of internal growth.

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Performance of sovereign wealth funds under the current oil price shock for the period (2014-2017) Case study of the Algerian sovereign wealth fund (RRF)

BENAMARA Dalila[1], CHERIF TOUIL Noreddine[2]

[1] University of Mostaganem, Algeria, (benamaradalila91@gmail.com)
[2] University of Mostaganem, Algeria, (ncherif2005@yahoo.fr)

Received: 15/07/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Abstract

The purpose of this study is to determine the role of sovereign wealth funds (SWF) in the economies of oil exporting countries, and the financial situation and the performance of the Algerian sovereign wealth fund RRF in the light of oil price decline.

The mains results of this study indicate that the revenue regulation fund RRF depends on a single source of financing and the sluggishness of the world oil market since mid-2014 led to the total depletion of fund's financial resource.

Keywords: sovereign wealth fund, oil prices decline, budget deficit financing, Algerian sovereign wealth fund RRF, oil exporting countries, financial resources of the fund.

JEL classification codes: C20, H62.

ملخص:

تهدف هذه الدراسة إلى تحديد الدور الذي تلعبه صناديق الثروة السيادية لاقتصاديات الدول المصدرة للنفط ،بالإضافة إلى تحديد الوضعية المالية وأداء صندوق ضبط الإيرادات الجزائري في ظل انخفاض أسعار البترول.

أهم النتائج الأساسية لهذه الدراسة تشير إلى أن صندوق ضبط الإيرادات الجزائري يعتمد على

Corresponding author: BENAMARA Dalila, **e-mail**: benamaradalila91@gmail.com

مصدر تمويل وحيد والمتمثل في فوائض إيرادات الجباية البترولية، كما أن انخفاض أسعار البترول المسجل على مستوى الأسواق المالية الدولية منذ منتصف جوان 2014 أدى إلى النضوب الكلي للموارد المالية للصندوق.

كلمات مفتاحية: صناديق الثروة السيادية، انخفاض أسعار البترول، تمويل عجز الخزينة العمومية، صندوق ضبط الإيرادات الجزائري، اقتصاديات الدول المصدرة للنفط، الموارد المالية للصندوق.

1. INTRODUCTION

The sharp drop in oil prices since the second half of 2014 has posed several challenges for each of the importing countries, that seeks to benefit from the advantage of oil prices fallen that have been positively reflected in the form of low public finance deficits, and low energy support bill and improve the business climate in Some countries, that allow spending in Infrastructure and increased consumption in this countries, and for oil-exporting countries, lower prices of oil led to the decline in export earnings and the deterioration of public finances (Regional economy outlook, April2016, p. 2)and the significant fiscal surpluses it has earned over the past decade have turned into a deficit and The slowdown in growth rates in addition to the ability of Governments to spend in these countries have been reduced, such as Algeria and some Gulf Cooperation Council countries.

Under these circumstances of the new oil reality, oil-exporting countries adopt corrective policies to absorb the shock of oil prices by reducing general expenditures and find new sources of revenue such as taxing and reducing exemptions, in addition to withdrawing from the large preventive financial precautions, while some countries resorting to borrowing, given the importance of sovereign wealth funds at the global financial arena in terms of the volume of financial assets under management (AUM)the amount of financial assets managed (AUM) by sovereign wealth funds was estimated at about 6.51trillion USD(Prequin sovereing wealth fund, 2015)

and as a source of preventive precautions for their own countries, which depend heavily on oil revenues, oil-exporting countries are continuing to adapt with the decline in current oil prices by reducing public spending, increasing revenues and financing the deficit of public budgets using several tools and trade-offs through the use of State resources (such as sovereign wealth funds), or external borrowing (sovereign bonds), Domestic borrowing (Treasury bonds or commercial loans).

The Governments of oil-exporting countries adopt consolidation measure to counter the shock of low prices and finance the deficit in their budgets, by withdrawing from sovereign wealth funds that was created for stabilizing the public budget and protecting the economy from fluctuations of oil price(Dutch disease), or even That draw from sovereign wealth for future generation .

Problematic:

"The advantages of using sovereign wealth funds as a tool to cover fiscal deficits in the country budget may result in reduced pressures on domestic liquidity and availability of funds at any time, as for risks that may accompany the use of sovereign wealth fund to cover fiscal deficits can lead to depletion of The financial assets of this latter and may result in higher borrowing costs or losses due to asset liberalization in inappropriate circumstances"(Bogamber & al, 2016, p. 15)**.**

Many countries have announced the withdrawal of financial assets from their sovereign wealth funds for the first time, such as the Norwegian sovereign wealth fund GPFG, while some countries have deducted or withdrawn significant financial assets that led to total depletion of financial resources, if energy prices continue to fall, such as the case of the Algerian sovereign wealth fund RRF, so in this study we ask the following key question:

How oil price fallen impact the performance of the Algerian sovereign wealth fund RRF?

The main question of the study is divided into the following questions:

- How oil prices fallen affect the performance of sovereign wealth funds?

- What is the financial situation of the Algerian sovereign wealth fund RRF in the light of the decline in oil prices in international financial markets?

Hypotheses:

- The decline in oil prices has affected the evolution of sovereign wealth funds asset's and investment strategies.
- There is a statistically and economically significant relationship between oil price and of the Algerian sovereign wealth fund resource.

We use the descriptive approach and analytical approach to analyze the financial situation of the Fund RRF during the period (2000-2016), and econometric study to assess the impact of oil price on fund's resource by using simple regression model.

The plan of this study is as follows:

First section: The performance of sovereign wealth funds in the light of the decline of oil price.

Second section: The performance of the Algerian sovereign wealth Fund RRF in the light of oil price fallen.

2. Performance of sovereign wealth funds in the light of oil price fallen:

The Collapse of the oil prices recorded during this period is the largest decline in international financial markets since its temporary decline in 2008 due to the global financial crisis, after the price boom since 2000, which has lasted for more than a decade, oil prices have fallen by about 55 %percent since September 2014 (developments in regional economic outlook, 2015, p. 5), and continued to collapse until the beginning of 2017.

Under this situation oil-exporting countries, which depend heavily on revenues of oil exporting, adopted a generally corrective policies to reduce general spending (Saudi Arabia has reduced budget expenditure in the 2016 at about 14% compared with actual expenditures in previous years, Oman and Qatar announced a reduction in the level of expenditure) (Alkhabircapital, 2016)and increased revenues through taxation, resorting

to internal or external borrowing or using state resources through sovereign wealth funds).

The decline in oil prices since mid-2014 has affected the performance of sovereign wealth funds (nakhle, 2016, p. 02)in two ways:

First: With the collapse of oil prices, revenues from oil exports have declined, especially in countries whose economy depends on the export of oil as a source of national income, such as the GCC countries and Algeria, led to reducing of foreign exchange reserves accumulation, which are the source of funding for these funds, The following table represents the evolution of the volume of financial assets managed for some sovereign wealth funds.

Table 1. Evolution of the volume of assets under management (AUM) for some sovereign wealth funds (2010-2015).

(AUM)BILLION USD	2010	2011	2012	2013	2014	2015
RRF Algeria	-	-	58	65	66.7	34.7
SAMA (Saudi Arabia)	459	557	656	717	724	661
KIA Kuwait	266	296	322	386	548	592
KNF Kazakhstan	27.44	38.26	52.52	64.39	72.99	65.44
RF Russian*	40.88	25.60	61.40	86.93	88.94	59.53
NWF Russian*	88.22	88.26	87.47	88.06	79.97	72.22

Source: Funds profile, sovereign wealth center, website www.sovereignwealthcenter.com/fund-profiles.html on 12/08/2017–*ministry of finance Russian federation statistics prepared by researchers (volume of national wealth fund and reserve fund, data of the last month of the year) website old.minfin.ru/en/statistics on 28/07/2017.

The assets under management AUM of sovereign wealth funds recorded a decrease of 1.3 trillion USD in 2015 compared to the previous year, according to the annual report of sovereign wealth funds (Sovereign Investments Lab) (Borttolloti & al, 2016, p. 44)

Second: The decline in oil prices in international financial markets has shaped the investment and operational strategy of the sovereign wealth

funds, where significant assets have been drawn from these funds to cover the budget deficits of this country (nakhle, 2016, p. 02)

The most important decisions or actions taken to mitigate the effects of low oil prices by using sovereign wealth funds (stabilization funds or reserve funds) are:

- Saudi Arabian Monetary Authority (SAMA) has withdrawn more than 70 billion USD from its sovereign wealth fund in 2015(Stone, 2015)**,** which has an estimated financial assets of 560 billion USD (Borttolloti & al, 2016, p. 44)
- The Russian reserve fund has liquidate assets worth more than 20 billion USD to cover the federal budget deficit, the assets of this (SWF) decreased from 142.6 billion USD in 2008 to 32.2 billion USD in the year 2016, while the Russian Finance minister warned that the fund's resources will be depleted by the end of the year if the Russian government continues to deduct the assets of the Fund in order to cover expenses(nakhle, 2016, p. 02)
- QIA divested some stacks as part of portfolio reshuffle driven by oil concerns, the most notable divestments was investments in both the German construction company Hochtief, the French company Vinci SA and property sales in London for an aggregate value exceeding 1.5 billion USD(Borttolloti & al, 2016, p. 16).
- The first Norwegian minister announced in October 2015 that it would be withdrawing from the sovereign wealth fund to cover the budget deficit and stimulate growth, a 780 million USD withdrawn in January 2016(Solvik & chopra, 2016)The asset of Government fund of the State of Kazakhstan according to the Financial Times, it will dry up (assets under management 64.2 billion USD) by the year 2026, if government continues the current pattern of expenditure and if oil prices will not rise, about 19 billion USD was withdrawn in the third quarter of 2015(Attracta, 2016)

3. Algerian sovereign wealth fund RRF performance in light of oil price fallen:

In this section we study the impact of oil price on Algerian economy, and the policies taken by authorities to regulate the overall financial situation, and then we will assess the financial situation and performance of the Fund RRF during the period 2000-2016.

3.1.The Impact of the decline in oil prices on Algeria's economy.

The decline in oil prices in global financial markets since late 2014 has affected the overall financial situation, external accounts and the economy outlook, reflecting the structural weakness of the Algerian economy, where the following were recorded:

- Concerning public finances, there was a budget deficit, with a high deficit of 15.4%/PIB in 2015 compared to 2014 that was 7.3%/PIB, due to collapse in hydrocarbon revenue and significant budget expenditure (Bank of algeria, 2016, p. 56)
- Sold of the current account of the balance of payments recorded its Second consecutive deficit after fifteen years of surpluses. In addition, this deficit deteriorated significantly between 2014 and 2015, rising from 9.28 billion USD to 27.48 billion USD respectively (Bank of algeria, 2016, p. 46).
- The balance of the trade has been quasi-equilibrium in 2014 (+ 459 million) at a deficit of 18.08Billion USD in 2015, recorded its first deficit, after eighteen (18) consecutive years of surpluses (Bank of algeria, 2016, p. 45)**.**
- Budgetary revenues are 5 103.1 billion dinars(50.77Billion USD) against 5 738.4 billion dinars (71.19B USD)in 2014, a decrease of 635.3 billion dinars (-11.1%), This significant decrease in budget revenue results from that of the oil revenues (-1014.9Billion DA, or-30%) despite the significant increase in Non-hydrocarbons revenue of 379.7 billion DA (3.77 Billion USD)(Bank of algeria, 2016, p. 05)
- A sharp decline in exchange reserves, moving from 178.93 billion USD in 2014 to 144.33 billion USD in 2015.

3-2- Fiscal consolidation in the light of oil prices decline.

In the light of structural weakness of Algerian export revenues, which depend heavily on oil exports, and the sharp decline of oil price in international financial markets, Algeria has taken the following response policies:

- Rationalization of imports through measures that contribute to the containment of the increase in imports by the Bank of Algeria, by lowering the precautionary standard for the level of foreign trade bank obligations, relative to its own assets (Bank of algeria, 2016, p. 07)**.**
- Export subsidies outside the hydrocarbon sector through the cancellation of the Bank of Algeria's licensing of the import of materials, which is in the process of manufacturing export-oriented products abroad (Bank of algeria, 2016, p. 08)**.**
- The Bank of Algeria is developing the exchange market between banks in order to protect the economic operators from the risk of exchange and to encourage investment and export.
- Bank of Algeria allowing a 25%depreciation of Algerian dinars (DA) against the US dollar, (the real effective exchange rate depreciated by 4.3%) (souissi, 2016), these policies played a large role as a shock buffer of low oil prices, although this policy alone cannot Sustained consequences of low price collapse(Bank of algeria, 2016, p. 08)
- Resorting to internal borrowing through the issuance of national debt for economic growth (ENCE)(MFDGI, 2017)**(**, starting from 17 April 2016, for a six-month subscription process, 557billion DA that equal to5.29 billion USD was realized from this operation.
- Determine upper limits of public expenditures in the range of 6800 billion DA (at about 60 Billion USD) over the next three years starting in 2017, and adoption reference price of 50$ per barrel, a price closer to the current barrel price in the financial markets.
- Through the finance law of 2017, the value added tax (TVA) has been raised from 17% to 19% for the normal rate, and from 7% to 9% for the

reduced rate, for raising the state's financial revenue (Algerian republic official journal, 2016).

- With drawals was made from the Fund (Regulation Revenue Fund), led to a depreciation of asset under management (AUM), which moved from 4408.5 billion DA(54.96 Billion USD) at the end 2014 to 2072 billion DA(20.61Billion USD) at the end of 2015, reduced by 53% in one year, the volume of the fund knew a further depreciation until beginning 2018, and it reached its level of the statutory minimum of 740 billion DA(about 10.19 billion USD) in the end of the February of 2018(Bank of algeria, 2016, pp. 09-10)

3.3. Evaluation of financial situation of FRR:

We assess The contribution of the Algerian sovereign wealth fund RRF to finance public treasury deficit, and its goals through two phases, the first phase consists of favorable circumstance characterized by the continuous increase of oil prices from 2000 to mid-2014, the second Phase consists the collapse of oil prices in international financial markets since mid- 2014 until 2016.

3.3.1. Phase I:

During this phase from 2000 to mid-2014, we distinguished the following periods that represent the most significant changes related to the Fund's objectives and funding.

First period 2000-2005:

During this period, the Fund's activity was limited to repayment of public debt (Bouflih, 2010-2011, p. 226), without being used to finance budgetary deficits due to higher hydrocarbon prices (prices exceeded reference oil price 19$ per barrel)The objectives of the Fund under article 10 of Finance law 2000 are set as follows: control budget balance of annual Finance Act, as well as reduction of public debt, and hydrocarbon revenue exceeds what was estimated by the finance law, The following table present evolution of the financial situation of RRF during the period 2000-2005.

Table 2. Evolution of the financial situation of RRF 2000-2005 (BILLION DA).

Years	2000	2001	2002	2003	2004	2005
Previous year sold	0	232.1	171.1	27.9	320.8	712.6
Oil revenue surplus	453.2	123.8	26.5	448.9	623.4	1368.8
Bank Algeria Advances	0	0	0	0	0	0
sold before withdrawal	453.2	356.0	198.0	476.8	944.3	2090.5
public debt repayment	221.1	184.4	170.0	156.0	222.7	247.8
finance treasury deficit	0	0	0	0	0	0
repayment bank of Algeria	0	0	0	0	0	0
Total withdrawal	221.1	184.4	170.0	156.0	222.7	247.8
Sold after withdrawal	232.1	171.5	27.9	320.8	721.6	1842.6
*Average price of oil barrel ($)	28.6	24.9	25.3	29.0	38.6	54.3

Source: financial Situation of revenue regulation fund, *average price of oil barrel, website http://www.dgpp-mf.gov.dz,consulteon 27/05/2017.

Oil prices during this period ranged from 28.6$ in 2000 to 54.3$ in 2005 (see table 2), where significant oil revenue surpluses were transferred to the Fund that estimated at about 3044 billion DA(33.43 Billion USD) during this period (2000-2005),According to the finance law2004, a new resource has been added to the fund RRF for repayment of external debt before maturity date that was central bank (bank of Algeria) advances.

Second period 2006-2013:

During this period, the RRF is geared towards financing the deficit of the public treasury, an adjustment was made in Fund's expenditure through the finance Law 2006(Bouflih, 2010-2011, pp. 228-230)to financing the deficit of the public treasury without exceeding the minimum required level (740 billion DA at about 10.20B USD), this period was characterized by a high price of oil, a significant oil revenue surpluses was transferred to the Fund (see table 3), the volume of withdrawals from this fund RRF to finance the deficit of the public treasury increases as a result of rise government expenditure, public debt repayments were discontinued in 2008.

The following table represents the evolution of the financial situation of the fund RRF.

Table 3. Evolution of the financial situation of RRF2006-2013 (BILLION DA)

Years	2006	2007	2008	2009	2010	2011	2012	2013
Previous year sold	1842.6	2931.0	3215.5	4280.0	4316.4	4842.8	5381.7	5563.5
Oil revenue surplus	1798.0	1738.8	22881.1	400.6	1318.10	2300.3	2062.2	1810.3
Bank Algeria Advances	0	0	0	0	0	0	0	0
sold before withdrawal	3640.6	4669.8	5503.6	4680.7	5634.7	7143.1	7917.0	7659.8
public debt repayment	618.1	314.4	465.4	0	0	0	0	0
finance treasury deficit	91.530	531.9	758.1	364.2	791.4	1761.4	2283.2	2132.4
repayment bank of Algeria	0	607.9	0	0	0	0	0	0
Total withdrawal	709.6	1454.3	1223.6	364.2	791.9	1761.4	2283.2	2132.4
Sold after withdrawal	2931.0	3215.5	4280.7	4316.4	4842.8	5381.7	5633.7	5563.5
*Average price of oil barrel ($)	65.0	74.4	99.1	61.6	80.0	112.9	110.7	109.1

Source: financial Situation of revenue regulation fund, *average price of oil barrel, website http://www.dgpp-mf.gov.dz,consulteon 27/05/2017.

Rise in oil prices in international financial markets has led to an increase in the volume of oil revenue surpluses transferred to the fund, at the same time, the average amount of money withdrawn to finance the deficit of the public treasury was increased at about 507 billion DA(7.169 Billion USD) during the period 2006-2010(see table 3).

Starting from2011, a significant amounts have been drawn from the fund RRF compared to previous years, with withdrawals estimated at more than 6177 billion DA(80.60 Billion USD) during the period (2011-2013) (see table 3), to finance the public treasury deficit as a result of rising public expenditures under the implementation of the five-year development programme2010-2014 (programme de soutien à la reliance économique) to support the economic recovery(Yahya, 2016, p. 36), at the same time a significant financial surpluses of oil revenues were transferred to the fund, the average amount estimated is about more than 6897 billion DA(90 Billion USD) during the period (2011-2013)in light of higher oil prices in financial markets Where the average price of barrels of oil during this period was estimated at more than 109 US dollars.

3.3.2. Phase II:

In this part we assess financial situation of the Algerian sovereign wealth fund RRF in light of oil prices collapse in international financial markets since mid- 2014 until 2016.

During this period (2014-2017) financial resources of the fund completely depleted, as a result of oil price shock, where this period was characterized by the withdrawal of large financial amount from the Fund RRF to finance the deficit of the public treasury due to increase of government expenditure and Sharpe decline and sustained of oil price since mid-Jun 2014, where the oil revenue surplus has been reduced to over half 552 billion DA(5.194) in 2015 compared to the previous year 1810 billion DA(22.45 Billion) in 2014 (see table 4).

The financial amount that was withdrawn in 2015 was around 2886 billion DA to cover the deficit of the public treasury, which resulted in decline of fund's asset for more than half in one year from 4408 billion DA (54.68 Billion USD) in 2014 to 2073 billion DA (20.62 billion USD) in 2015,the draw from Fund's financial assets was continued in 2016 (Bank of algeria, 2016, pp. 09-10)until it reached the minimum level required (740 billion DA) starting from February 2017, through the finance law of 2017 the legal minimum required was abolished to finance budgetary deficit (Algerian republique officiel journal, 2017),the following table represents the evolution of the financial situation of fund RRF during the period 2015-2016.

Table 4. Evolution of the financial situation of RRF2014-2016 (Billion DA)

Years	2014	2015	2016
Previous year sold	5563.5	4408.1	2073.8
Oil revenue surplus	1810.3	552.1	985.5
Bank Algeria Advances	0	0	0
sold before withdrawal	7374.1	4960.3	2172.3
public debt repayment	0	0	0
finance treasury deficit	2965.6	2886.5	1387.9
Repayment bank of Algeria	0	0	0
Total withdrawal	2965.6	2886.5	1387.9

Sold after withdrawal	4408.4	2073.8	784.4
*Average price of oil barrel ($)	99.14	52.8	44.7

Source: financial Situation of revenue regulation fund, *average price of oil barrel, website http://www.dgpp-mf.gov.dz,consulteon 27/05/2017.

This period starting in 2014 has shown the weakness and structural imbalance that characterizes the Fund RRF, the fund highly influenced by fluctuations of oil prices, as it is funding by oil revenue surplus and is used to finance the deficit of the public treasury, Since 2014, the fund has been reduced from 4408.5 billion DA (54.69 Billion USD) to 784.5 billion DA (7.16 Billion USD) in 2016, a decrease of 82.20%.

3.4. Result of empirical study:

In this part of the study, we assess the impact of oil price on oil revenue surplus transferred to the fund, so that we test the second hypothesis that there is a statistically and economically significant relationship between the oil price and Fund recourse.

The Fund RRF is financed through a single source that was oil revenue surpluses, so we will study the relationship between the independent variable oil price that is determined through international financial market, and a dependent variable that is oil revenue surplus transferred to the fund RRF.

To estimate the simple regression model and the relationship between the two variables, therefore a general form of the proposed model as follows:

$$PLUSVALU = \beta_0 + \beta_1 PRIXPETR + \varepsilon_i \ldots . (eq1)$$

i: Number of observation that reflects the years of the period studied (2000-2016).

PLUSVALU: The dependent variable is the oil revenue surplus transferred to Fund RRF (billion$).

PRIXPETR: The independent variable is the average price of barrels of crude oil (US $).

ε_i: Error or noise term.

The following table represents the values of the dependent variable and the independent variable during the study period, as follows:

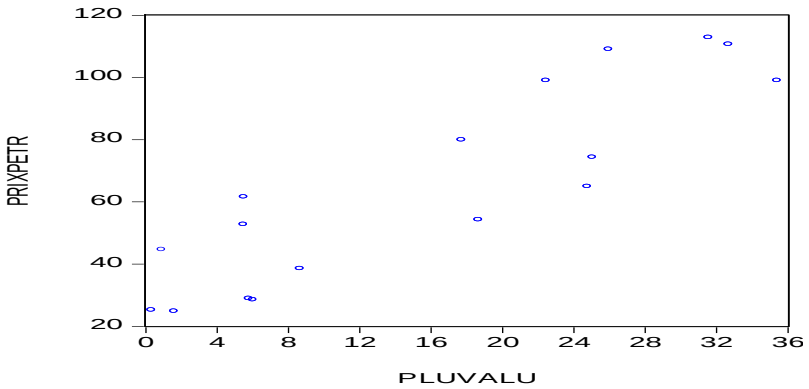
Table 5. Represents oil revenue surplus transferred to the fund RRF and the average price of barrels of crude oil (2000-2016).

years	Oil revenue surplus (billion$).	Average price of barrels of crude oil (US $).
2000	6,019	28.6
2001	1,602	24.9
2002	0.333	25.3
2003	5,800	29
2004	8,648	38.6
2005	18,649	54.3
2006	24,766	65
2007	25,055	74.4
2008	35,420	99.1
2009	5,519	61.6
2010	17,719	80
2011	31,554	112.9
2012	32,672	110.7
2013	25,973	109.1
2014	22,461	99.1
2015	5,494	52.8
2016	0.900	44.7

Source: elaboration by researchers, Financial Situation of revenue regulation fund and average oil price barrel, website[http://www.dgpp-mf.gov.dz, consulte](http://www.dgpp-mf.gov.dz) le 27/05/2016.

3.4.1. Type of correlation between the variables of estimated equation.

Figure 1. Simples scatter.



Source: output Eviews 7

The Simple scatter indicate that there is a high correlation between the dependent variable (oil revenue surpluses transferred to fund RRF) Oil revenue surplus result from oil revenue actually realized for particular year n - oil revenue estimated by law finance for same year n. and the independent variable (average oil barrel price) (see figure1).

Table 6. Correlations matrix between dependent and independent variable**.**

Correlation		
	PLUVALU	PRIXPETR
PLUVALU	1	0.8909742048493366
PRIXPETR	0.8909742048493366	1

Source: output Eviews 7.

The coefficient of correlation is estimated at 0.891, a positive and very strong (see table6)

R = 0.891 there is a significant positive correlation between the dependent variable (PLUSVALU) and the Independent variable (PRIXPETR).

3.4.2. Estimation of regression equation:

We use result of Eviews7 to estimate the equation of the regression model of the dependent and independent variable as follows:

Table 7. Result of regression equation

Dependent Variable: PLUVALU
Method: Least Squares
Date: 05/12/18 Time: 19:42
Sample: 2000 2016
Included observations: 17

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-6.462549	3.239213	-1.995099	0.0645
PRIXPETR	0.340913	0.044858	7.599820	0.0000

R-squared	0.793835	Mean dependent var	15.79906
Adjusted R-squared	0.780091	S.D. dependent var	12.15795
S.E. of regression	5.701409	Akaike info criterion	6.429435
Sum squared resid	487.5910	Schwarz criterion	6.527460

Log likelihood	-52.65020	Hannan-Quinn criter.	6.439179
F-statistic	57.75727	Durbin-Watson stat	0.924724
Prob(F-statistic)	0.000002		

Estimation Command:

==========

LS PLUVALU C PRIXPETR

Estimation Equation:

==========

PLUVALU = C(1) + C(2)*PRIXPETR

Substituted Coefficients:

==========

PLUVALU = -6.4625489679 + 0.340912829884*PRIXPETR

Source: output Eviews 7.

We define the equation of the regression model of the dependent (plus valu) and independent variable (prix petr) as follows:

$$PLUSVALU = -6.463 + 0.341PRIXPETR$$

3.5. Statistical analysis of the estimated model

In this part we use We use F-statistics to test the ratio of the variance explained by the regression and the variance not explained by the regression, and We use t-test student to test the slop of regression model.

3.5.1. Student-t- test

From result of regression equation (table 08) we have result of t-test student as follow:

Table 08.Result of t-test student

estimated model variable's	coefficient	t-statistic	t-table student	probability
PRIXPETR	0.341	7.60	2.131	0.000

Source: elaboration by researcher's, depending on result of table7

We use t-test student to test the slop of regression model as follow:

$H_0: \beta = 0$ the dependent variable Y has not linear relationship with the independent variable X

$H_1: \beta \neq 0$ The dependent variable Y has linear relationship with the independent variable X

We compared between $T_{n-k}^{\alpha/2}$andT_{calcul}

$T_{n-k}^{\alpha/2} = T_{15}^{0.25} = 2.131$

$T_{calcul} = 7.60$

$T_{calcul} = 7.60 > T_{n-k}^{\alpha/2} = T_{15}^{0.25} = 2.131$

So we reject the null hypothesis H_0 and accept the alternative hypothesis H1, that means that dependent variable oil revenue surplus has linear relationship with the independent variable of the average oil price for barrel (see table 7).

3.5.2. F-statistics test

We use F-statistics to test the ratio of the variance explained by the regression and the variance not explained by the regression as follow.

$H_0: \beta = 0$

$H_1 : \beta \neq 0$

Where:

$F_{n-k}^{\alpha} = F_{15}^{0.05} = 4.54$

$F_{calcul} = 57.758$(see table 07).

$$F_{calcul} = 57.758 > F_{15}^{0.05} = 4.54$$

So we reject the null hypothesis H_0 and we accept the alternative hypothesis H_1 ,this means that the variation in dependent variable is explained by linear regression, there is a relationship between the dependent variable and the independent variable, and the model is statistically significant according to Fisher's Test(see table 7).

3.6. Regression analysis:

We useR2-value and Adjusted R square to analyses estimated equation economically as follow:

R2-value = 0.794 This means that79.40% of the variance in oil revenue surpluses can be explained by oil prices, and 20.6% of the variation in oil revenue surplus is presumed to be due to random variability (see table 7) .

Adjusted R -square=0.780 means that the independent variable (the price of the oil barrel) contributes to the interpretation of the dependent variable by 78% (see table 7).

The slop of independent variable (average oil price) is positive (β1 = 0.341), that mean an increase in oil price leads to increase in oil revenue surpluses transferred to the fund RRF, which is economically correct.

Increase of oil price with 1 USD led to an increase in oil revenue surplus transferred to the fund by 341 million USD, and the opposite is right, oil revenue surplus is calculated on the basis of the difference between oil revenue that actually realized for a particular year and oil revenue that is estimated by Finance law for the same year, so the financial resources of the Fund RRF are strongly influenced by an external variable, which is the oil price that is determined in the international financial markets.

The Fund RRF depend on a single source of funding, which is oil revenue surplus, in addition to the current financial situation for the latter, in 2016the fund reached the minimum level required (740 billion DA) that was abolished by the finance law of 2017to finance budgetary deficit.

The Financial situation of the fund calls for a rethinking of how the fund should be operating, so we suggest that financial assets should be investing to achieve abnormal financial returns through international financial markets (emerging markets and advanced markets) by creating a reference portfolio that invests in stocks and bonds, investment funds and hedge funds, as well as to make an adjustment on fund's objectives, RRF in term of his current objectives finance public debts, both external and internal, and the deficit of the public treasury, where the operating expenditure account for more than 60% of the deficit budget.

4. Conclusion:

The decline in oil prices has affected the performance of the sovereign wealth funds of the oil-exporting countries, in two ways through a decline in the volume of financial remittances transferred to these funds as a result of declining oil export revenues resulting from lower prices, and also

affected the investment and operational strategy of these funds, as some funds have resorted to liquidating their investments or making deductions from their financial resources.

With regard to the financial situation of the Algerian sovereign wealth fund RRF during the current period characterized by lower oil prices, a substantial financial cuts were made to finance the deficit of the public treasury, where the fund reached the minimum level required (740 billion DA) that was abolished to finance budgetary deficit through the finance law of 2017, which indicates to a completely depletion of the Fund's financial resources.

The sovereign wealth fund RRF depend on a single source of funding, which is oil revenue surpluses, and therefore the financial resources of Fund are impacted by fluctuation of oil price, which is determined through international financial markets, where the oil revenue surplus was shifted in 2014 from 1810 billion DA (22.45 billion USD) (average oil price of the barrel is estimated at 99.1 $) to 98 billon DA in 2016(0.894 Billion USD) (average oil price of the barrel44.7$).

Financial resources of the Algerian sovereign wealth fund RRF will depend heavily on future oil prices, volume of oil revenue surplus transferred to the Fund if oil price rise will be calculated by the adoption of a new oil reference price 50$ per barrel approved through the finance law of 2017.

The current financial situation of the RRF reflects the structural imbalance of the Fund in term of funding, therefore we suggest adjustment of fund’s objectives for which it was created by combining the objective of stabilizing the economy and objective of investing their assets in order to achieve positive higher abnormal return and ensure renewable financial resources, by investing its financial assets through international financial markets using a reference portfolio, and benefit from the experiences of leading sovereign wealth funds such as the Norwegian sovereign wealth fund GPFG, in addition to adjusting fund’s uses to support and develop Algerian economy Instead of directing towards financing public treasury deficit.

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Are the Egyptian travel agencies learning organizations?

Bassam Samir ALROMEEDY [1], Fatma Zohra TALHI [2]

[1] Univessity of Sadat City, Egypt, (bassam.samir@fth.usc.edu.eg)

[2] University souk ahras, Alegria, (fatmazohra.talhi@yahoo.fr)

Received: 04/08/2018 **Accepted:** 26/12/2018 **Published:** 23/01/2019

Abstract

Learning organization characteristics supports travel agencies to keep up with constant changes in tourism labor market. Also, learning organization characteristics help travel agencies achieve the sustainable competitive advantage. The study focused on answering the question: To what extent the Egyptian travel agencies have the characteristics of the learning organizations?. Out of 250 questionnaires distributed on a random sample of employees in travel agencies – category A in greater Cairo, 216 have been retrieved and found usable for analysis. The study proved that the Egyptian travel agencies – category A in greater Cairo have the learning organizations' characteristics. Therefore, Egyptian travel agencies – category A are considered learning organizations. The study recommended that considering learning the base of work and success on intensive competitive business environment.

Keywords: learning organization, organizational learning, travel agencies, Egypt.

JEL Classification Codes: Z32.

ملخص

تدعم خصائص المنظمات المتعلمة شركات السياحة لمواكبة التغيرات المستمرة في سوق العمل السياحي، كما تساعد تلك الخصائص في تحقيق الميزة التنافسية المستدامة. وقد ركزت الدراسة علي الإجابة علي التساؤل التالي: إلي أي مدي تمتلك شركات السياحة المصرية خصائص المنظمات المتعلمة؟

Corresponding author: Bassam Alromeedy, **e-mail**: bassam.samir@fth.usc.edu.eg.

تم توزيع 250 استمارة استقصاء علي عينة عشوائية من العاملين في شركات السياحة المصرية فئة "أ" بالقاهرة الكبري، وتم استرداد 216 استمارة صالحة للتحليل. وقد توصلت الدراسة أن شركات السياحة المصرية فئة "أ" بالقاهرة الكبري تمتلك خصائص المنظمات المتعلمة، ومن ثم تعد تلك الشركات منظمات متعلمة. وقد أوصت الدراسة بأن التعلم أساس العمل والنجاح في بيئة العمل شديدة التنافسية.

كلمات مفتاحية: المنظمات المتعلمة، التعلم التنظيمي، شركات السياحة، مصر.

1. Introduction:

Rapid changes in business environment, changes in the workforce abilities (Alipour et al., 2011), complexity and uncertainty of business environment, increasing customer needs (Singh, 2010), intensive competition (Korth, 2007), technological advancement and financial instability (Dekoulou and Trivellas, 2015) are the explicit features of current business environment (Nejad et al., 2012). Organizations that seek for strong performance and increasing their competitiveness should have the ability to create process, share and integrate new knowledge in order to be learning organizations (Balay, 2012). To be a learning organization is unavoidable in the fast and evolving business environment. Accordingly, these organizations are compelled to be learning organizations to cope with rapid changes in business environment (Recepoğlu, 2013). Employees should have innovation and creative ideas, academic excellence, skill for doing work, ardent to learn, and having the ability to adapt with changing in the 21st century (Dararat and Taechamaneestit, 2015).

The concept of learning organization became important as a source of competitiveness (Farrukh and Waheed, 2015). Learning organizations are those organizations that are keen to permanently learn in order to achieve their objectives and competitiveness (Chan and Scott-Ladd, 2004). The characteristics that distinguish the learning organization from the traditional are leadership, communicating information, empowerment, good organizational culture employees participating in setting organization's strategy and horizontal structure (Kraleva, 2011). Hence, it is imperative to be learning organizations; this is considered a strategic decision and an important factor for achieving competitive advantage in volatile business

environment (Khasawneh, 2011). There are some conditions for being learning organization, such as employees' tendency to risk taking, supporting organizational culture that provides an environment for information and knowledge sharing and dissemination (Kraleva, 2011). Additionally, providing a convenient structure and compatible strategy. Learning Organizations focus on continuous development (Gandolfi, 2006), helping organizations to adapt and response with changes successfully and effectively through developing structures and systems (Alas et al., 2012). It is imperative to strengthen and encourage employees, rather than managing employees (Yaşlıoğlu et al., 2014). Organizations' ability for continuous development to face the challenges in the environment has been related to the ability of these organizations to learn (Senge, 1990). Organizations seeks to be learning organization in order to create and provide new products or services to meet consumer needs, and then gaining sustainable competitive advantage (Vargas, 2015). Learning organization tend to create an organizational culture of learning (Gagnon et al., 2015). Sustainable organizations are learning organizations (Brazdauskas and Gaigalaite, 2015). The learning organization is widespread concept in the fast-growing businesses, like tourism industry (Kraleva, 2011). Tourism organizations should be learning organization to support their competitiveness, abilities and innovation. In hotels, applying learning organization theory support achieving sustainability goals (Brazdauskas and Gaigalaite, 2015). As they seek to provide the best products and services to their customers; tourism learning organization creates attitudes, processes and developing strategies. Also, these organizations try to be the best, and distinguish it from other competitors. Moreover, Tourism organizations need to become learning organizations, if they are seeking to reinforce their competitive advantage, efficiency and innovation (Kraleva, 2011).

Considering all this, the study presented here aims to answer the following question: To what extent the Egyptian travel agencies have the characteristics of the learning organizations?

This study is structured as follows: the next section outlines the concept of learning organization and its dimensions, characteristics and

importance. Then, the methodology and discussion of results, conclusion and recommendations. Finally, areas of further studies are presented.

2. Literature Review

2.1 Organizational learning vs learning organization:

There is a high consensus on the importance of learning processes in different organizations, besides increasing the importance of the learning organization and organizational learning concepts during the previous few decades (Lazarová et al., 2013). Learning organization concept was mentioned in Peter Senge's: The Fifth Discipline-The Art and Practice of the Learning Organization (Thepthepa and Mitsufuji , 2016). Organizational learning and learning organization were slightly used interchangeably in literature, but they are considered different concepts (Lien et al., 2006). Moreover, the learning organization and organizational learning are two sides of the same coin, where the organizational learning is the major activity in the learning organization (Abdullah and Kassim , 2008). Organizational learning refers to activities within the organization, while learning organization is the type of organization (Farrukh and Waheed, 2015). Additionally, organizational learning covers the sharing of the knowledge, values and assumptions of the individuals or groups in an organization (Yaşlıoğlu et al., 2014). learning organization has been defined according to a number of approaches as: A) Systems thinking approach: learning organization refer to employees who permanently seeks to develop their abilities to achieve the desire objectives by new thinking patterns, collective aspiration (Vatankhah et al., 2011), and team learning (Kalmuk and Acar, 2015). B) Learning perspective; learning organization is an organization that facilitates the employees' learning and constantly improves itself to achieve its strategic goals (Yang et al., 2004). C) Strategic perspective: learning organization is the ability of organization to create, acquire, and share knowledge, and amend behavior to highlight new knowledge and ideas (Kuşcu et al., 2015). D) Integrative perspective: An integrated model for learning organization was developed by Watkins and Marsick (1993) (Song et al., 2009).

2.2 Learning Organization characteristics and Dimensions:

Learning organization is an organization that improves its capabilities

on a continuous basis for long term benefits (Senge, 1990). Learning and work are combined in a continuance systematic technique to continue the improvements of individual, group and organization within learning organization (Hussein et al., 2016). Also, learning organizations provide continuous learning opportunities, using learning to reach their goals, linking individual performance with organizational performance, fostering inquiry and dialogue, considering creative and innovation as a source of sustainable competitive advantages and interacting with their environment continuously (Nakpodia, 2009). learning organizations are characterized by cultural values, leadership commitment and empowerment, communication, knowledge sharing, employee characteristics and performance upgrading (Sudharatna and Li , 2004). Moreover, features of learning organizations, are risk taking, support and recognition for learning, resources to perform the job knowledge management and training and learning environment (Kontoghiorghes et al., 2005). The most significant characteristics of a learning organization which is how they view their competitors. The learning organization deals with its competitors as a means for learning, rather than competition. Moreover, a learning organization considers its competition as an advantage, rather than a threat (Kraleva, 2011).

In his book: The Fifth Discipline, Senge (1990) depicted five disciplines of learning organization to achieve the goal of building a learning organization (Maden, 2012). These disciplines are personal mastery (Abbasi et al., 2012), mental models (Ponnuswamy and Manohar, 2016), shared vision, team learning, and system thinking (Kumar, 2015). These disciplines support infrastructure creation that reinforces continuous learning, adaptation, and organizations growth. So, one of the main goals of the learning organization is constructing an organizational culture of learning (Gagnon et al., 2015). (Goh, 2003) divided learning organization into five dimensions, which are Clarity of vision, Leadership commitment and empowerment, Experimentation and rewards, Effective transfer of knowledge, and Teamwork and group problem solving.

Learning occurs on three levels: individual, group, and organization (Tafvelin et al., 2017). Learning organization's model of Watkins and

Marsick's includes Systems-level and continuous learning that lead to create and manage knowledge outcomes which improve organization's performance and capacity for change (Rus et al., 2014). As Watkins and Marsick's (1993) mentioned, there are seven dimensions of learning organization, which are continuous learning, inquiry and dialogue, team learning, embedded systems, empowerment, system connection and strategic leadership (Watkins and Marsick, 1993).

2.3 Important of learning organization:

A learning organization facilitates the learning of all its employees and continuously transforms itself (Alipour et al., 2011; Nakpodia, 2009), and help organizations that endeavor for survival in competitive business environment (Haeffner et al., 2012). Learning support knowledge both explicit and implicit, change behavior, attitude, the way of thinking and performance of employees (Najafbagy and Doroudi, 2010). Learning organization aims to create an organizational culture of learning (Gagnon et al., 2015). Moreover, organizational learning explores and corrects errors, besides sharing the knowledge between employees and team within organizations (Najafbagy and Doroudi, 2010). Learning organization became an in important key factor in the success of organizations (Nazem and Mozaiini , 2014). learning organization positively improve organizational performance (Hanaysha, 2016), job satisfaction (Mirkamali et al., 2011) and employees commitment (Dekoulou and Trivellas, 2015).

Organizational learning reinforce permanent adapting and developing organization (Onağ et al., 2014). Learning organization develop a mechanism that provide resources and capabilities to decrease time and cost of determining the requirements of market, fulfill customer needs (Akgün et al., 2014), dealing more efficiently with rapid changes (Hsiao, 2011), exploiting opportunities in new markets, and facing threats in markets (Yeung et al., 2006). Additionally, learning organization seek to attract knowledge workers, decrease turnover and absenteeism (Kontoghiorghes et al., 2005), delivering products quickly, dealing with emergent problems and customers complaints (Ellinger et al., 2002). Learning organization is a source of gaining competitive advantage in business environment (Dicle and Köse , 2014). Learning organization provide opportunity for achieving

organizational profitability (Davis and Daley, 2008). Leaning organization is considered a vital factor for gaining sustainable competitiveness (Prelipcean and Bejinaru , 2016).

3. Methodology:

The objective of this study is to answer the following question: To what extent the Egyptian travel agencies have the characteristics of the learning organizations? In order to achieve this objective, the researcher used questionnaire to gather statistical data about demographic and other work related information of the respondents and the characteristics of learning organization within the Egyptian travel agencies.

The questionnaire was divided into two sections. Section A includes demographic and other work related information of the respondents (gender, age, education, position and work experience). Sections B represents learning organization dimensions including 21 items on a five-point Likert-type rating scale (1= strongly disagree, 5= strongly agree) modified from the scale developed by (Watkins and Marsick, 1997). The scale includes seven dimensions to identify the availability of learning organization characteristics in the Egyptian travel agencies – category A – in the greater Cairo region. These dimensions are:

Continuous Learning, refers to organization's attitudes to provide continuous learning opportunities for their employees (Jyothibabu et al., 2010).

Inquiry and Dialogue, represents an organization's effort to create a culture of questioning, feedback, and experimentation (Rus et al., 2014).

Team Learning and collaboration, represents the cooperation skills between the employees in using resources effectively as a team (Yang et al., 2004). Also, team learning includes encouraging cooperation, learning and working together and provide culture of teamwork in the organization (Leufvén et al., 2015).

Embedded System, indicates systems establishment to capture and share learning within organization (Tafvelin et al., 2017). This dimension focused on organization's ability to keep what is learned for using during ongoing changes (Lim, 2010).

Employee Empowerment, means the process of creating and sharing a collective vision and gathering information about the gap between the current status and the new vision (Hussein et al., 2016).

System Connection, includes thinking and actions from global perspective for linking the organization to its internal and external business environment (Dekoulou and Trivellas, 2015).

Strategic Leadership, notes if leaders think strategically about using learning to create and manage change and moving the organization towards new markets (Yang et al., 2004). Additionally, strategic Leadership is the using of learning as a strategic tool to achieve required organizational objectives (Dekoulou and Trivellas, 2015).

Questionnaire was handed out to a randomly selected sample of 250 employees in the Egyptian travel agencies – category A – in the greater Cairo, whereas 216 were retrieved which represent 86.4% of the total. The researcher used the Statistical Package of the Social Science (SPSS. V.22) to analyze data. The statistics techniques used in data analysis include Cronbach alpha to assess the reliability, frequencies, percentages, means, standard deviation, Mann-Whitney test and Kruskal-Wallis test were used to test the differences among demographics with regard to the other variables (gender, position and work experience). Mann-Whitney was used to compare two independent samples only, while Kruskal-Wallis was utilized to compare three or more groups.

Nunnally (1978) revealed that, in most social science research, reliability coefficient of 0.70 or higher is considered "acceptable" (Nunnally, 1978). Cronbach Alpha reliability was computed for the seven dimensions of learning organization and the test depicted that the reliability coefficients for all dimensions were above 0.830 which indicates that the instrument is reliable for being used.

4. Results and Discussion:

A) Demographic and other work related information:

Table 1. Demographic and work information

Demographic and work information		Freq.	%
Gender	Male	192	88.9
	Female	24	11.1
Age	Less than 25 years	26	12
	25-34 year	92	42.6
	35-44 year	84	38.9
	45-55 year	11	5.1
	More than 55 years	3	1.4
Education	Bachelor	202	93.5
	Diploma	3	1.4
	Master	8	3.7
	Other	3	1.4
Position	Manager	15	6.9
	Tourism manager	17	7.9
	Marketing manager	13	6
	Aviation manager	26	12
	Human resources manager	8	3.7
	Religious tourism manager	28	13
	Other	109	50.5
Job experience	Less than 5 years	77	35.6
	5-10 years	79	36.6
	11-15 years	44	20.4
	More than 15 years	16	7.4
Total		216	100%

Source: Results from SPSS V.22

Table (1) showed that, out of 216 respondents, 192 (88.9%) were males, while 24 (11.1%) of them were females. 12% of respondents were less than 25 years, while 42.6% were between 25 and 34 years, and 38.9% of them were between 35 and 44 years. The majority of respondents (93.5%) had a bachelor. Regarding respondents' position, 50.5% of employees work in different jobs within the Egyptian travel agencies – category A – such as transferman, tour leader, tour operator, reservation, customer service and traffic manager, while 13% of them worked as religious tourism manager, and 12% worked as aviation manager. 36.6% of employees had work experience between 5 and 10 years, while 35.6 % of them had work experience less than 5 years, and 20.4% had work experience between 11 and 15 years.

B) Learning Organization Dimensions

Table 2. Learning Organization Dimensions in the Egyptian travel agencies

Items		5	4	3	2	1	Mean	SD
Dimension 1: Continuous learning							3.33	1.42
In my organization, people help each other learn.	Freq.	89	71	2	24	30	3.76	1.44
	%	41.2	32.9	0.9	11.1	13.9		
In my organization, people are given time to support learning.	Freq.	71	68	5	43	29	3.50	1.46
	%	32.9	31.5	2.3	19.9	13.4		
In my organization, people are rewarded for learning.	Freq.	39	55	2	48	72	2.73	1.57
	%	18.1	25.5	0.9	22.2	33.3		
Dimension 2: Dialogue and inquiry							3.80	1.26
In my organiztion, people give open and honest feedback to each other.	Freq.	82	84	3	26	21	3.83	1.32
	%	38	38.9	1.4	12	9.7		

In my organization, whenever people state their view, they also ask what others think.	Freq.	55	97	5	32	27	3.56	1.35
	%	25.5	44.9	2.3	14.8	12.5		
In my organization, people spend time building trust with each other.	Freq.	96	80	7	14	19	4.02	1.24
	%	44.4	37	3.2	6.5	8.9		
Dimension 3: Team learning and collaboration							3.76	1.37
In my organization, teams /groups have the freedom to adapt their goals as needed.	Freq.	92	67	3	23	31	3.77	1.45
	%	42.6	31	1.4	10.6	14.4		
In my organization, teams /groups revise their thinking as a result of group discussions or information collected	Freq.	85	76	2	34	19	3.81	1.34
	%	39.4	35.2	0.9	15.7	8.8		
In my organization, teams /groups are confident that the organization will act as their recommendations.	Freq.	72	87	5	28	24	3.72	1.34
	%	33.3	40.3	2.3	13	11.1		
Dimension 4: Embedded systems							3.68	1.36
My organization creates systems to measure gaps between current and expected performance	Freq.	63	84	6	23	40	3.50	1.47
	%	29.2	38.9	2.8	10.6	18.5		
My organization makes its lessons learned available to	Freq.	81	73	5	32	25	3.71	1.40

all employees	%	37.5	33.8	2.3	14.8	11.6		
My organization measures the results of the time and resources spent on training.	Freq.	77	89	4	27	19	3.82	1.28
	%	35.6	41.2	1.9	12.5	8.8		
Dimension 5: Empowerment							3.81	1.32
My organization recognizes people for taking initiatives	Freq.	75	89	7	17	28	3.77	1.35
	%	34.7	41.2	3.2	7.9	13		
My organization gives people control over the resources they need to accomplish their work	Freq.	83	78	3	28	24	3.78	1.37
	%	38.4	36.1	1.4	13	11.1		
My organization supports employees who take calculated risks.	Freq.	88	76	5	33	14	3.88	1.27
	%	40.7	35.2	2.3	15.3	6.5		
Dimension 6: Systems connections							4.16	1.01
My organization encourages people to think from a global perspective.	Freq.	102	88	4	14	8	4.21	1.02
	%	47.2	40.7	1.9	6.5	3.7		
My organization works together with the outside community to meet mutual needs.	Freq.	87	99	2	16	12	4.08	1.10
	%	40.3	45.8	0.9	7.4	5.6		

My organization encourages people to get answers from across the organization when solving problems.	Freq.	98	93	5	9	11	4.19	1.03
	%	45.4	43.1	2.3	4.1	5.1		
Dimension 7: Strategic leadership							4.34	.96
In my organization, leaders mentor and coach those they lead	Freq.	134	68	3	3	8	4.47	.90
	%	62	31.5	1.4	1.4	3.7		
In my organization, leaders continually look for opportunities to learn	Freq.	116	72	4	13	11	4.25	1.10
	%	53.7	33.3	1.9	6	5.1		
In my organization, leaders ensure that the organization's actions are consistent with its values	Freq.	111	82	7	9	7	4.30	.95
	%	51.4	38	3.2	4.2	3.2		
Total mean and standard deviation							3.84	1.20

Source: Results from SPSS V.22

Table (2) depicts the availability of characteristics and dimensions of learning organizations in the Egyptian travel agencies – Category A, where the mean is 3.84, and the standard deviation 1.20. The seventh dimension (**strategic leadership**) has the first rank in term of availability in the Egyptian travel agencies (mean= 4.34 & SD= 0.96), then the sixth dimension (**systems connections**) (mean= 4.16 & SD= 1.01), followed by the fifth dimension **(empowerment)** (mean= 3.81 & SD= 1.32), then after that the second dimension (**dialogue and inquiry**) (mean= 3.80 & SD= 1.26), then the third dimension (**team learning and collaboration**) (mean= 3.76 & SD= 1.37), followed by the fourth dimension (**embedded systems**)

(mean= 3.68 & SD= 1.36) and finally in the last rank; the first dimension (**continuous learning**) came (mean= 3.33 & SD= 1.42).

In some detail; employees help each other learn within travel agencies (mean= 3.76 & SD= 1.44), and these agencies give employees the chance and time to learn (mean= 3.50 & SD= 1.46). But 55.5% of respondents reported that, no rewards presented these agencies to employees who seek to learn (mean= 2.73 & SD= 1.57). The mean of continuous learning dimensions in travel agencies was 3.33 and the standard deviation was 1.42. This result indicates the relative interest of travel agencies – category A to support the learning of employees and to develop their knowledge and experience.

In the context of travel agencies seeking to dialogue and discuss with employees to identify their views and construct a strong confidence among them; there is transparency and integrity in these agencies by providing a clear feedback to all employees in the same time (mean= 3.83, SD= 1.32), Besides, employees seeking to know what others think after presenting their ideas (mean= 3.56, SD= 1.35). Moreover, for strong relations, employees spend time to construct trust with others within agencies (mean= 4.02, SD= 1.24). The mean of dialogue and inquiry dimension in travel agencies was 3.80 and the standard deviation was 1.26. This result confirmed that, travel agencies focus on dialogue and discussion with employees to know their views and suggestions and the potentiality of building trust.

Regarding to travel agencies' supporting for employees and encouraging them to cooperate and work as a team; employees have a freedom to achieve their objectives as they want (mean= 3.77, SD= 1.45), and teams review and refine ideas and suggestions after group discussion and information gathering (mean= 3.81, SD= 1.34). Additionally, employees make sure that agencies implement their recommendations (mean= 3.72, SD= 1.34). The mean of team learning and collaboration dimension in travel agencies was 3.76 and the standard deviation was 1.37. This result revealed that, these agencies continuously encourage employees to work as a team, team learning and more cooperation for agencies' success.

As travel agencies seek to improve performance; it sets a system for measuring the gap between the current and expected performance to identify obstacles affecting the current performance and non-arrival to expected performance (mean= 3.50, SD= 1.47). Information and learning lessons are available for all employees to learn from them (mean= 3.71, SD= 1.40). Travel agencies also focus on returns of training on improving employees and agencies' performance (mean= 3.82, SD= 1.28). The mean of embedded systems dimension in travel agencies was 3.68, and the standard deviation was 1.36, which clarify the interest of these agencies to achieve optimal performance, and training programs evaluation on an ongoing basis to increase the returns of these programs.

In terms of empowering employees in travel agencies; these agencies appreciate employees for taking initiatives (mean= 3.77, SD= 1.35), besides, supporting them to control over resources required to perform their work and achieve their objectives (mean= 3.78, SD= 1.37) and promoting employees who taking risks (mean= 3.88, SD= 1.27). The mean of empowerment dimension in travel agencies was 3.81 and the standard deviation was 1.32, which reflect the attitude of travel agencies to empower their employees through encourage them to take initiatives, take risks and give them a freedom in the way of achieving their objectives.

From the results of globalization, including the opening markets and global competition; travel agencies encourage their employees to think from global view, and how to exploit available chances for their agencies (mean= 4.21, SD= 1.02), alongside integration and work to meet and satisfy the needs of the outside community (mean= 4.08, SD= 1.10). Moreover, these agencies emphasize employees to rely on accurate information in solving problems (mean= 4.19, SD= 1.03). The mean of systems connections dimension in travel agencies was 4.16 and the standard deviation was 1.01, which demonstrate the attitude of travel agencies to work and compete in global business environment and provide services and products that fulfill outside community's desires. Additionally, depending on accurate and sufficient information in solving problems.

In the light of global attitude to strategic planning, strategic management, long-term planning and strategic leadership; We find that, travel agencies' managers monitor and follow up employees effectively and continuously to make sure that the work goes according to plan (mean= 4.47, SD= 0.90). Managers also search for learning chances and exploit them (mean= 4.25, SD= 1.10). Moreover, managers make sure that practices and actions of agencies are compatible with its values and organizational culture (mean= 4.30, SD= 0.96). The mean of strategic leadership dimension in travel agencies was 4.34 and the standard deviation was 0.95 that highlight the strategic perspective and orientation of the management of these agencies and strategically and effectively think to achieve competitive advantage.

Table 3. The differences among gender with regard to learning organization according to Mann-Whitney test

	Gender	***N***	***Mean Rank***	***Mann-Whitney U***	***Wilcoxon W***	***Z***	***Sig.***
Learning organization	Male	192	113.85	1.276	1.576	-3.574	0.137
	Female	24	65.76				

Source: Results from SPSS V.22

As showed in table (3) there is no significant differences between gender and learning organization where the p values for all of them were above .05.

Table 4. The differences among position and work experience with regard to learning organization according to Kruskal-Wallis test

			N	Mean Rank	Chi-Square	Sig.
Learning organization	Position	Manager	15	197.00	185.405	.238
		Tourism manager	17	197.00		
		Marketing manager	13	184.31		
		Aviation manager	26	159.65		
		Human resources manager	8	141.25		
		Religious tourism	28	123.21		

		manager				
		Other	109	55.09		
Learning organization	Work experience	Less than 5 years	77	178.00	194.220	.192
		5-10 years	79	99.89		
		11-15 years	44	38.52		
		More than 15 years	16	8.50		

Source: Results from SPSS V.22

As showed in table (3) there is no significant differences between position and work experience and learning organization where the p values for all of them were above 05.

5. Conclusion and Recommendations:

Learning organizations focus on continuous improvement and development in employees' knowledge and expertise and encourage managers to learn. Learning organizations are those organizations that constantly seek to learn, exploit opportunities, achieve goals and thus achieve a competitive advantage. It is also one of the hallmarks of today's business environment. Availability of learning organization characteristics in travel agencies help them adapting with changes in labor market. The prime objective of this study was to answer the following question: To what extent the Egyptian travel agencies have the characteristics of the learning organizations?. The results of this study concluded that, travel agencies – category A in greater Cairo have the learning organizations' characteristics. The results also revealed the availability of the seventh dimensions of learning organizations in travel agencies – category A at varying levels but close. Based on these results, Egyptian travel agencies – category A in greater Cairo are considered as learning organizations.

Although the availability of characteristics and dimensions of learning organizations in travel agencies are evident, there are some recommendations in order to make these characteristics more available within these agencies. These recommendations are:

- Considering learning the base of work and success on intensive competitive business environment and it is a continuous and effective process to achieve the competitive advantage;
- Encouraging, motivating and rewarding employees who seek to learn.
- Encouraging employees to create and share knowledge;
- More empowerment for employees in decision making and the necessity of employees' participation in travel agencies management;
- Providing feedback to employees about performance evaluation and giving recommendations to treat deficiencies in performance;
- Motivating employees to think from strategic and global perspectives continuously;
- Searching for different thinking ways that improve decision making process and create ideas and suggestions to develop travel agencies;
- Providing effective, flexible and simple communication system within travel agencies;
- Rewarding employees for continuous looking for new information in business environment.

6. Area of Further Studies:

This study focused on discovering the extent to which the Egyptian travel agencies have the characteristics of the learning organizations. Further studies are needed to discuss the factors affecting the availability of these characteristics. Future research should discuss the relationship between some variables such as strategic planning, human resources management practices, organizational culture and learning organization dimensions in travel agencies. To identify the importance of these characteristics, further studies can be conducted to determine the impact of these characteristics on some organizational variables such as performance, job satisfaction, commitment, innovation and customer service. All of this would give a clear and comprehensive perceptions about the role of learning organization characteristics in travel agencies.

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Analysis of the impact of foreign direct investment on some economic indicators in Algeria

MEKARSSI Lemya [1], BRIKA Said [2]
[1] University Larbi Ben M'hidi, Oum El Bouaghi, (mekarssi@gmail.com)
[2] University Larbi Ben M'hidi, Oum El Bouaghi, (saidbrika@yahoo.fr)

Received: 15/07/2018 **Accepted:** 18/11/2018 **Published:** 23/01/2019

Abstract

This study aims to analyze foreign direct investment performance of Algeria and its impact on some economic indicators (Real GDP, Trade Balance and Unemployment Rate), by applying the correlation test during the period of 1996-2015.

The results showed that foreign direct investment have positive impact on Algerian economy through gross domestic product and trade balance. However, the FDI do not contributed in the absorption of unemployment.

Keywords: FDI; Economic indicators; Correlation test; Algeria.
JEL Classification : F21 ; B22 ; C40 ; O55.

ملخص

تهدف هذه الدراسة إلى تحليل أداء الاستثمار الأجنبي المباشر في الجزائر ومدى تأثيره على بعض المؤشرات الاقتصادية (الناتج المحلي الإجمالي الحقيقي، الميزان التجاري ومعدل البطالة) من خلال تطبيق اختبار الارتباط خلال الفترة 1996-2015.

أظهرت نتائج الدراسة أن للاستثمار الأجنبي المباشر تأثير ايجابي على الاقتصاد الجزائري من خلال الناتج المحلي الإجمالي والميزان التجاري، إلا أن الاستثمار الأجنبي المباشر لا يساهم في امتصاص البطالة.

كلمات مفتاحية: الاستثمار الأجنبي المباشر، المؤشرات الاقتصادية، اختبار الارتباط، الجزائر.

Corresponding author: Mekarssi Lemya, **e-mail**: mekarssi@gmail.com.

1. INTRODUCTION

Foreign direct investment can make a positive contribution to a host economy. Foreign direct investment is one of the most important capital that has witnessed a great development due to the important and vital role it plays in the transfer of technology, and modern technologies, and contribute to the accumulation of capital, and raising the efficiency of human capital and improving skills and expertise.

Algeria, as one of many developing countries, has increasingly come to see FDI as not only a source of economic development, but also a tool for modernization, growth of income, employment, etc. This is reflected by the current economic reforms and policies to improve the conditions to attract more FDI and maximize its benefits in the domestic economy. Since this new initiative, Algeria has become much more liberal in its economic policies, aiming to attract more FDI and increase its economic growth, aiding to alleviate poverty (Salim, 2008, p. 80) .

1.1 Statement of problem

What is the potential impact of foreign direct investment on some Algerian economic indicators?

1.2 Research question

The analysis shall be guided by the following questions:

- What is the extent impact of FDI on economic growth in Algeria?
- What is the effect of FDI on trade balance in Algeria?
- Does the FDI reduce the level of the unemployment in Algeria?

1.3 study hypotheses

- There is a positive impact of FDI on economic growth in Algeria.
- There is a positive effect of FDI on trade balance in Algeria.
- The FDI contributes to the absorption of unemployment in Algeria.

1.4 Objectives of study

- To analyze the foreign direct investment trend and structure in Algeria.
- To examine the effect of foreign direct investment on Algerian

economic level.

1.5 Methodology

The study adopts two main methodological approach; the first approach includes the analysis of foreign direct investment trend and composition, and analysis some Algerian economic indicators. The second approach includes mathematical statistics methods based on the correlation test by using Eviews program regarding the period of 1996-2015 for investigating the extent impact of foreign direct investment on Algerian economy.

1.6 Literature review

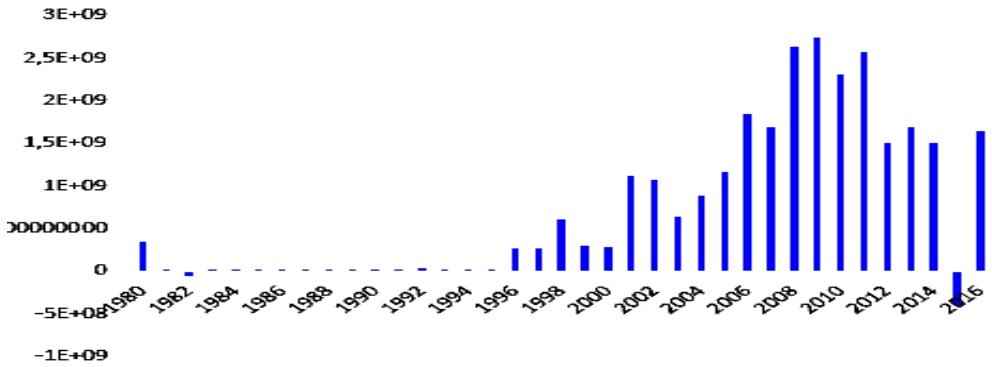
- **Brahimi Houda et al (2013),** examined the extend contribution of FDI on Algerian economy. They found that the FDI inflow did not contribute enough in Algerian economy, because of the weakness of FDI inflow and the concentration of most projects in the hydrocarbon sector (Houda, 2013, p. 694)
- **Kamel Si Mohamed et al (2015)** investigated the impact of FDI on Algerian economy by applying the bound testing ARDL and ECM-ARDL during the period of 1970-2014. The result showed that the political and macroeconomic stability are not enough to attract FDI to help non-hydrocarbon sectors drive economic growth (Mohamed, 2015, p. 1470)
- **Aida Barkauskaite and Violeta Narskeviciute (2016)** analyzed the impact of foreign direct investment on economic indicators of the Baltic countries by using the correlation test. They found that foreign direct investments have a positive impact on both of GDP and labour productivity growth in all Baltic countries, however foreign direct investment do not influence the unemployment in this countries (Barkauskaite, 2016, p. 61).

2. Overview of Algerian's foreign direct investment

2.1 FDI trend in Algeria

Algeria has sought to take many measures and adopt a series of reforms with the aim of improving its investment environment and attracting more foreign investment flows. The stages of the flow of foreign direct investment into Algeria can be divided into stages as follows:

Fig.1. FDI inflow to Algeria during the period of 1980-2016



Source: completed by the author based on:

- (The World Bank Indicators, 2018).
- UNACTAD (UNCTAD, 2017).

-First phase 1980-1995: this period has been characterized by almost complete absence of the inflow of foreign direct investment to Algeria; due to the complex situation in Algeria at all levels (economic, political and social aspects). Where Algeria's macro-economic situation worsened, in large part because oil prices declined steeply. This stage witnessed a worsening of the external debt crisis and the rise in external debt services, the deterioration of the security situation, political and economic instability and high risks have had a negative impact on attracting foreign investment (حسين، 2009، صفحة 59).

-Second phase 1996-2002: This stage was characterized by an improvement in the value of foreign investments following to Algeria, where it achieved an average of USD 3,42 billion, mostly concentrated in the hydrocarbons sector, while the other sectors did not witness any development in attracting foreign direct investment.

-Third phase 2001-2016: This period witnessed a remarkable improvement in the volume of foreign investments flowing into Algeria, which exceeded one billion dollars. Where in 2002 Algeria occupied the first rank in the Maghreb countries and the third rank in Africa in terms attracting foreign direct investment. This improvement was due to a number of factors including the reforms that affected the investment sectors,

especially after the issuance of the investment law of 2001 on the development of investment through:

-The introduction of the principle of freedom of investment;

-The adoption of international standards in attracting FDI;

-Creating an environment conducive to attract FDI;

-Encourage foreign investors by providing financial and tax incentives (Caputo, 2004, pp. 1-7).

In 2007, foreign direct investment in Algeria declined by 7% to reach USD 1.7 billion, to increase again in 2009 to reach USD 2.74 billion dollars and this is the highest FDI inflow known by Algeria since its independence. During the period of 2010-2016, the foreign direct investment inflow recorded fluctuations between the slight increase and decline. Where in 2011, the FDI inflows increased by 11.77% compared to 2010, and Algeria topped the list of inter-Arab investment hosting countries for 2011, with flows amounting to USD5.4 billion, with a share of 78% of the total inter-Arab FDI inflow (The Arab Investment& Export Credit Guarantee Corporation Report T. A., 2011, p. 25). In 2012, foreign investments inflow to Algeria dropped to USD 1.5 billion i.e by 41.7%, and Algeria ranked at the fourth place among the Arabic countries with a share of 6.25 % (The Arab Investment& Export Credit Guarantee Corporation Report T. A., Investment Climate in Arab Countries: Dhaman Investment Attractiveness, 2012-2013, p. 83)

Between 2013 and 2014, FDI inflows to Algeria registered a slight increase averaged a growth rate of 0.81%, and that due to the measures taken by the Algerian government, especially under the finance law of 2014 which related to stimulate investment with foreign partners (ANDI D. R., 2015, p. 10). Against this, Algeria witnessed a notable negative decline in FDI inflows to USD- 4.03 billion in 2015. In 2016, after the sharp decline in the FDI inflow in 2015, it notably increased again to get USD 1.64 billion. Due to the improvement of investment policies on the one hand, where Algeria set a new investment law and provided incentives for taxation and facilities necessary for investment projects, and the improvement of oil production on the other hand.

2.2 FDI sectoral composition

FDI inflows into Algeria are concentrated in certain limited sectors. The hydrocarbon sector is dominated the largest share of these flows. Table 1 shows the sectoral distribution of foreign direct investment inflow in Algeria during the period of 2002-2016.

The number of Algerian FDI projects inward amounted to 822 projects. Estimations reveal that the overall investment cost of those projects, which employ some 119525 thousand workers, is close to 2216699 million DZD.

Table 1. FDI composition by sectors in the period of 2002-2016

Sector	No. of projects	% of total projects	Capital amount(million DZD)	% of total capital amount
Agriculture	14	1.70	4373	0.20
Construction	137	16.67	77661	3.50
Industry	495	60.22	1783922	80.48
Health	6	0.73	13572	0.61
Transportation	25	3.04	14820	0.67
Tourism	14	1.70	113772	5.13
Services	130	15.82	119139	5.37
Communication	1	0.12	89441	4.03
Total	822	100	2216699	100

Source : (ANDI, 2018)**.**

Table 1 shows that the industrial sector topped the economic sectors in attracting foreign direct investment at all levels (in terms of number of projects, project cost, number of new jobs) by (60.22%, 80.48%, 59.23%) respectively.

The number of foreign projects invested in the industrial sector reached 495 projects, which represents 60.22% of the total investment projects. Most of the projects in this sector are concentrated in the fields of energy and oil, which is characterized by a large public, projects that need large amounts of money compared to the other sectors. The industrial projects in the non-hydrocarbons sector include food, chemicals, plastics,

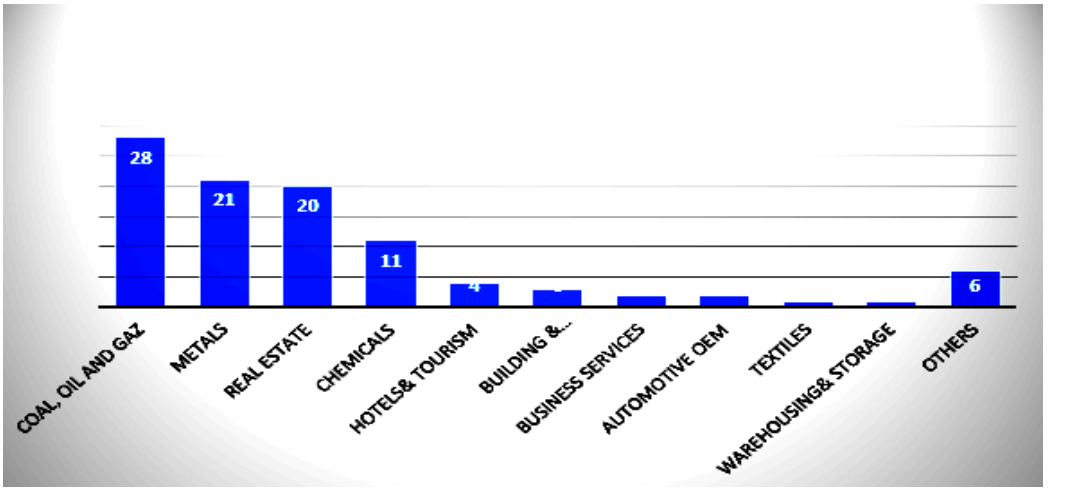
wood and paper, as well as textiles, leather, building materials and glass.

The construction sector occupied the second rank in terms of the number of foreign projects invested in Algeria, which amounted to 137 projects i.e 16.67% of the total projects with a cost of 77661 million DZD.

The services sector came at the third rank with 130 projects of total foreign investment projects, where their share represent 15.82% of the total projects, while the number of projects completed in the transport sector was negligible, with only 25 projects of total projects completed i.e 3.04%.

As for the other rest sectors, the proportion of investment did not exceed 2%.

Fig.2. Development of investment projects according to the most Important sectors in Algeria in 2003-2015



Source: (The Arab Investment& Export Credit Guarantee Corporation Report T. A., Investment Climate In Arab Countries: Dhaman Investment Attractiveness, 2017, p. 61)

From the above figure, we note that foreign investment incoming to Algeria are concentrated in the coal, oil and gas sector with a percentage of 28%, while 21 % are in minerals sector and 20% in the real estate sector, 11% in chemical sector.

2.3 FDI geographical distribution

Many Arab and Foreign countries have FDI projects established in Algeria, the following table shows the countries investing in Algeria during the period (2012-2016).

Table 2. FDI inflows by countries during the period of 2012-2016

Regions invested	*Cost (million dollars)*	*%*
Asia Pacific	6905.2	15.21
Western Europe	3659.9	24.2
Middle East	2466.2	16.1
Emerging European Countries	1613.6	10.6
Africa	557.1	3.6
North America	58.6	0.4
Latin America and the Caribbean	12.7	0.1

Source: (The Arab Investment& Export Credit Guarantee Corporation Report T. A., Investment Climate In Arab Countries: Dhaman Investment Attractiveness, 2017, p. 61)

From the above table we note that multiple countries invested in Algeria. It is obvious according to the table 2, that Algeria's FDI flows are centered on four continents, which are respectively the following: Asia Pacific, Western Europe, Middle East, and Emerging European Countries.

Asia countries are dominant in terms of project and capital with value of US$ 6905.2 million i.e 45.2% of total costs projects invested in Algeria. China is one of the most important Asian countries investing in Algeria, where it ranked as the first foreign investor in Algeria with a largest cost of projects amounted to US$ 3509 million, which represents 22.98% of the total costs. China State Construction Engineering Corporation Company is one of the biggest and important foreign companies invested in Algeria with a cost of US$ 3300 million.

As the second major investor Algeria, Western Europe Countries with US$ 3659.9 million i.e 24.2% of total costs, and this is due to the partnership agreement with the European Union, which has led to increased European investment. Spain is considered as most important Western Europe investor in Algeria with 8 projects with a value of US$ 2247 million where it occupied the first rank, where the company Grupp Ortiz construction y servicios del mediterraneo occupied the third rank in terms of cost of investment projects estimated at US$ 2209 million.

Germany, Switzerland, France and United Kingdom were on the list of the European countries investing in Algeria, in terms of investment cost of

the projects, with a share of 14.71%, 2.49%, 1.92%, 1.75% and 1.53% respectively.

The Middle East countries occupied the third rank with the value of US$ 2466.2 million which representing 16.1% of total costs. Qatar is one of the most important Middle East countries invested in Algeria with two projects, with a value of US$ 2150 million. Followed by Turkey, where the cost of investment flows estimated at around US$ 1598 million i.e 10.46%.

The cost of projects flowing from Emerging European countries estimated at around US$1613.6 million. As for the investments flows from Africa, North America and Latin America and the Caribbean it is limited and very insignificant where their shares to the total investment costs, represented only 3.6%, 0.4% and 0.1% respectively.

3. Analysis of some Algerian indicators

3.1 Economic growth

Between 1995 and 1996, the GDP growth rate averaged 4% mostly driven by the hydrocarbons sectors. Where the exports growth averaged 6.9%, followed by a sharp slowdown in 1997 to around 1%, because of the deterioration in the agricultural sector, as well as lower growth in the construction sector and public works and continued decline in the industrial sector level (Lemya, 2013, p. 477).

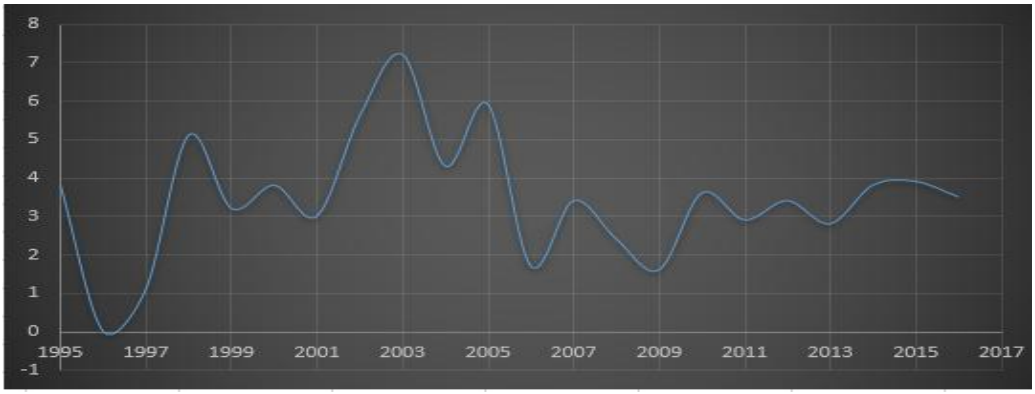
From 2000 to 2010, the Algerian's real GDP growth rate averaged 3.6%, driven by the performance of the oil and gas sector, as well as the contribution of the services, construction and public works sectors, and to a lesser extent the agricultural sector, which recorded a bumper cereal harvest in 2009. The vitality of the services and construction sectors stems mainly from the huge volume of public investments (Yousfi, 2013, p. 09)

Real GDP growth in 2015 was 3.9%, against 3.8% in 2014, driven mostly by agriculture, especially vegetable production, and by a noticeable rebound in oil and gas activity in q4 of 2015. Against a background of falling global oil prices since June 2014, this rebound followed nine consecutive years of decline (African Developemnt Bank, 2018)

Real GDP growth in 2016 was 3.5% compared with 3.9% in 2015, following recovery in the hydrocarbons sector based on increases in

production, refining and liquefaction activities (Tarik Benbahmed, 2017, p. 2)

Fig.3. Real GDP Growth of Algeria, 1995-2016



Source: (The World Bank Indicators, 2018).

3.2 balance of trade

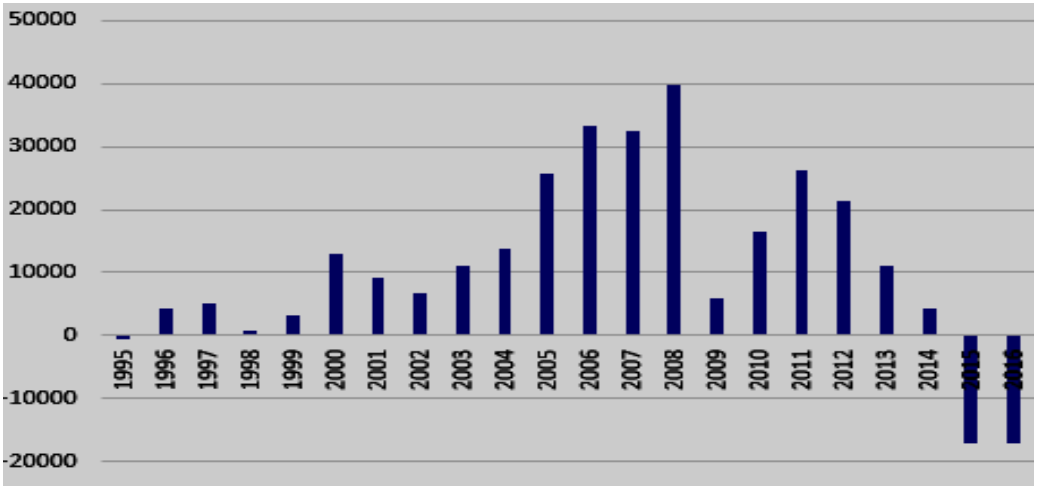
Fig.4. show the balance of trade in Algeria over the period of 1995-2016. After 1995, the balance of trade recorded a continuous surplus (except in 1998). Nevertheless the decline registered in the balance of trade had been quickly exceeded when the oil prices increased notably in 2000 (They achieved USD 35.5 dollars per barrel), which led to a significant surplus in the trade balance that reached about USD12858 million. Then, the trade balance decreased to USD 9192 million in 2001 and USD 6816 million in 2002 due to the volatility in the oil prices.

From 2003 until 2008, the balance of trade registered an increasing surplus reached USD 39819 million in 2008, except in 2007 where decreased by 1.88% compared to 2006 due the decrease in oil prices. In 2009, the balance of trade decreased to USD 5900 million that is a very considerable drop compared to 2008, due to the decrease in exports revenues. To increase again during 2010 and 2011 from USD 16580 million to USD 26242 million.

After 2011, the trade balance recorded a steep successive decreasing particularly in 2014, where decreased by 74.03% compared to 2010 and that mainly due to the recent oil crises.

In 2015, the balance of trade recorded a deficit reached about USD -17 034 million, this trend can be explained by the decline in imports and exports recorded during the aforementioned period. In 2016, Algeria's trade deficit amounted to around USD17.06 billion, mainly due to the fall in the oil prices which led to the fall the oil export revenues.

Fig.4. Trade Balance in Algeria, during the period 1995-2016



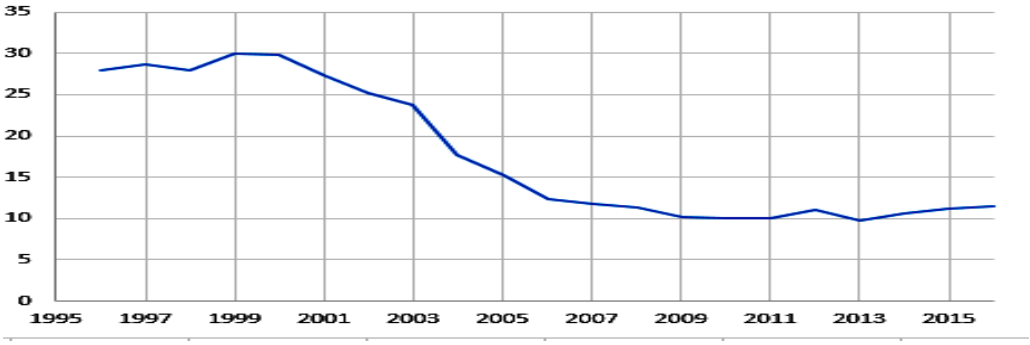
Source: calculated by the author based on the data of:

- (Rapport Du Centre National De L'Informatiques et Des Statistiques, 2010)
- (Direction Générale Des Douane, 2018)

3.3 Unemployment level

The Algerian total unemployment rates have decreased markedly since 2000, but it remain high (Fig.5.). Total unemployment declined from 25.49% in average in the period of 1990-1999 to 15.22% in average in the period of 2000-2016, and the mainly due to the economic recovery program, which the Algeria took it in recent years.

Fig.5. Real GDP Growth of Algeria, 1995-2016



Source: calculated by the author based on the data of:
- (ONS, 2018)
- (FMI, 2001, 2006, 2009, 2012, 2013)
- (The World Bank Indicators, 2018)

4. Results discussion

In order to investigate the impact of foreign direct investment on some Algerian economic indicators and the strong relationship between them, the correlation test is used.

A correlation coefficient measures the strength and direction of a linear association between two variables. It ranges from -1 to 1. The closer the absolute value is to 1, the stronger the relationship. A correlation of zero indicates that there is no linear relationship between the variables. The coefficient can be either negative or positive (Callaghan, 1996, p. 1).

4.1 Data set

The data used in this study are foreign direct investment (FDI), real GDP (GDP), Trade Balance (TB) and unemployment rate (L). The data set used in this study is obtained from different source, which include the World Development Indicators, national office of statistics, IMF country report. The data set is annually and covers the period 1996-2015.

4.2 Analysis of results

Applying the correlation testing procedure in order to examine the relationship between FDI and economic indicators, the calculated correlation coefficients show that GDP, trade balance and significantly correlate with FDI; the correlation coefficient in Algeria is more than 0.7,

which proves a strong positive correlation between the variables. This means in the turn that these variables move in the same direction. The results are shown in table 3.

Table 3. Results of correlation test between FDI and Economic Indicators in **Algeria**

Variables	Correlation coefficient	T statistic
GDP	0.77	5.31
TB	0.86	7.11
L	0.59	3.17

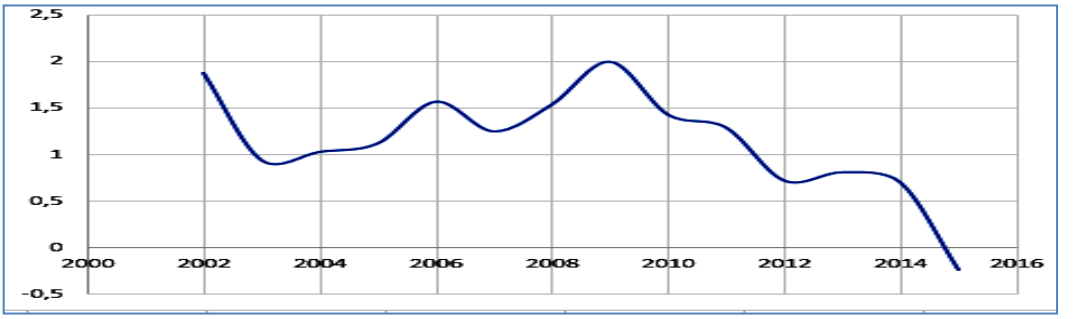
Source: Result imported from Eviews8.

GDP and FDI is 77% correlated, there are 86% correlations between FDI and trade balance, and all variables have 100% correlation among themselves.

The result of the relationship between FDI and Real GDP showed the positive impact of FDI on GDP, which indicates the **validity of the first hypothesis.**

Despite the evolution in the volume of foreign direct investment inflows to Algeria during the period 2002-2015, however the contribution of these investments to GDP remains weak, where the FDI flows realized the highest share as a ratio of GDP 2% in 2009 estimated at USD1.06 billion, to be the highest FDI inflow known by Algeria in this year. Due to the great investment opportunities, that Algeria government has provided during this year, as part of the development plans. (See Fig .6.).

Fig.6. FDI contribution to the economic growth



Source: (The World Bank Indicators, 2018)

During the period (2010-2015), the contribution of foreign direct investment (FDI) to GDP registered continuous declines, mainly due to the decline in FDI flows especially in the energy and mining sector between 2011 and 2012, because of the difficult political events witnessed by some Arabic countries.

As well as the failure to improve the conditions for attracting foreign, direct investment in various productive sectors, and the concentration of most of the projects in the hydrocarbon sector, beside to the weakness of the business climate, where the share of FDI in GDP recorded a negative value by 0.42% in 2015.

As for the relationship between FDI and balance of trade, the result of correlation showed that there is a strong positive relationship between the two variables, where the correlation coefficient was 0.86%. Where the tax measures contained in the investment laws and tax law aims to bring hard currency, diversify exports and create the competitiveness of Algerian goods in the markets. This result **is consistent** with the **second hypothesis**, that the FDI have a positive effect on trade balance.

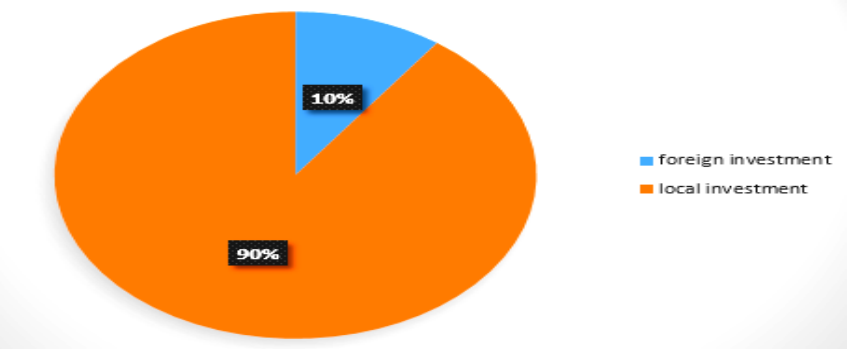
Thus, the positive effect of foreign direct investment on the balance of trade is reflected in the increase of the production and export of oil products, since most FDI projects are concentrated in the hydrocarbon sector, which dominates the Algerian economy by about 97% of total exports. As this sector requires substantial capitals in exploration on one hand, and the rising of financial risk factor associated with exploration on the other hand, Algeria has opened this important source for foreign (Doing Business, 2016, p. 37)

However the result of the correlation test between FDI and Unemployment rate and unemployment rate showed that there is a positive medium relationship between them, which means that FDI and unemployment rate move in the same direction (Since the coefficient is positive). Which means in turn that although the increasing in FDI inflows, the unemployment rate continued to increase. These results indicate the **invalidity of the third hypothesis.**

This result can explained by the concentration of most of the FDI

projects in the hydrocarbon sector, the FDI projects invested in Algeria did not contribute enough in the economy development.

Fig.7. Contribution of both FDI and local investment in job creation in Algeria during the period 2002-2016



Source: (ANDI, 2018).

According to the statistics set out in the figure.7, it can be note that during the period 2002-2016, the number of the Algerian workers being employed by foreign companies during this period was approximately 119525 workers. Which represents 10% of the total provided job opportunities by investment projects during the same period, versus 1018887 job opportunities provided by national projects, which represents 90% of the total job opportunities.

The foreign investment companies in the industrial sector attracted the largest number of the national labour force; since the industrial sector created alone 70793 job opportunities during this period of a total of 119525 job opportunities offered by the foreign companies among which represent 59.23%, where most industry activities related to hydrocarbon sector.

The companies investing in building, sector came in the second rank concerning the contribution in creating job in Algeria by offering only 23040-job opportunities i.e 19.28%. Despite that this sector is considered as labour-intensive sector, The weak contribution of this sector in creating jobs is due to the companies' reliance on the foreign labour brought from their parent countries, such as the Chinese companies activating in the building

and public works, which significantly relies on the Chinese (Houda, 2013, p. 693)

5. CONCLUSION

The objective of this study has been to analyze the Algerian foreign direct investment trend and composition and its impact on some economic indicators (Real GDP, Trade Balance and Unemployment Rate).

From the analysis of the FDI trend and composition, we conclude that most FDI inflows to Algeria are concentrated on hydrocarbon sector, and Algeria has not been able to attract large amounts of FDI away this sector. Therefore, the FDI projects invested in Algeria did not enough contributed in the economy development.

The analysis of the indicators relating to the impact of foreign direct investment on economic indicators (GDP, trade balance and unemployment rate) showed that FDI play a significant role in enhancing economic growth and increasing the Trade balance. However, the FDI does not contributed in the absorption of the unemployment in Algeria and that mainly due to the weakness of attracting FDI in other sectors than oil. Therefore, there is need to intensify the government's efforts to diversify the economy away from hydrocarbons.

Algeria still needs to create the good conditions to attract large amounts of foreign investments especially in non-hydrocarbon sectors. To achieve that Algeria must stimulate economic growth outside the oil sectors, which will encourage the diversification of FDI inflows to the country, which allow in turn benefiting from the positive effect of foreign direct investment.

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Islamic finance: A promising form of financing in frastructure's projects
A proposal for a solar energy station financed by islamic sukuk

BENBEKHTI Seyf Eddine[1], BOULILA Hadjer[2], BOUTELDJA Abdelnacer[3]
[1]University of AbouBekr Belkaid Tlemcen, (bensifou3@gmail.com)
[2] University of AbouBekr Belkaid Tlemcen, (b.hadjer94@gmail.com)
[3] University of AbouBekr Belkaid Tlemcen, (bouteldja_nacer@yahoo.fr)

Received: 15/09/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Abstract:

The aim of this study is to highlight the effective role of Islamic Sukuk in financing infrastructure projects especially renewable energy projects, by examining the possibility of financing a "Solar Energy Station" in Algeria. The reason behind choosing this subject is the importance of renewable energy in the preservation of the environment and the climate on a hand, and in building a green economy from another hand. Thus, This project will take a place in the Algerian Sahara with a capacity of 4050 MW, and will be divided into four allocations. So, this paper will present a proposal for a solar farm at the Wilaya of Adrar with the capacity of 1350 MW financed with Islamic Sukuk.

As a result, the Algerian enormous potential for renewable energy and the nature of the Algerian community that believe in Shariah-compliant, this project would be a successful alternative for gas and oil, especially after the recent oil crisis and would certainly reduce the pressure on government budget as well.

Keywords: Islamic sukuk, renewable energy, solar farm, infrastructure financing.

JEL Classification: E62, R42, H74, H76, G12

[1] **Corresponding author**: Benbekhti Seyf Eddine, **e-mail**: bensifou3@gmail.com.

ملخص:

تهدف هذه الدراسة إلى تسليط الضوء على الدور الفعال للصكوك الإسلامية في تمويل مشاريع البنية التحتية وخاصة مشاريع الطاقة المتجددة، وذلك من خلال دراسة إمكانية تمويل "محطة للطاقة الشمسية" في الجزائر. السبب وراء اختيار هذا الموضوع هو أهمية الطاقة المتجددة في الحفاظ على البيئة والمناخ من جهة، وفي بناء الاقتصاد الأخضر من جهة أخرى، وسيأخذ هذا المشروع مكانًا في الصحراء الجزائرية بسعة 4050 ميجاوات، وسيتم تقسيمه إلى أربعة حصص. وبالتالي سنقدم من خلال هذه الورقة اقتراحًا لمحطة للطاقة الشمسية في ولاية أدرار بسعة 1350 ميجا واط بتمويل من خلال الصكوك الإسلامية.

ونتيجة لذلك، فإن القدرة الجزائرية الهائلة على الطاقة المتجددة وطابع المجتمع الجزائري الإسلامي الذي يؤمن المعاملات المالية الموافقة للشريعة الإسلامية، هذا المشروع سيكون بديلًا ناجحًا للغاز والنفط، خصوصًا بعد أزمة النفط الأخيرة وبالتأكيد سيقلل من الضغط على ميزانية الحكومة كذلك.

كلمات مفتاحية: الصكوك الإسلامية ،الطاقات المتجددة، محطة الطاقة الشمسية، تمويل البنية التحتية

Introduction:

Islamic finance became more popular and widely used especially after the global financial crisis (2008), where it turns out to be one of the most important financial instruments in the world in both Muslim and non-Muslim countries, due to its advantages "Flexible, easy to issue and trade, low risk" that are suitable for investors, businessmen and governments.

Therefore, Islamic Sukuk recently contributed in financing many infrastructure and public projects –which is considered as the backbone and the lifeline of all economic (Handayani, 2017, p. 116), social and environmental activities – without any burden on the government budget. It also became often used in the repayment of the federal and the public debt and in covering the government deficit.

However, Due to the big importance of the infrastructures and renewable energy projects, as a pillar of the development of any economy, and because of the lack of funding resources, several case studies have been

put forward to analyze and sometime propose initiatives and models of financing these projects. Starting with (Bobinaite, 2014, p. 260)who discussed the cost and the financing aspect of community renewable energy "solar and wind energy" through tax and feed-in-tariffs in Denmark, where they showed that PV projects have several advantages then wind energy. and according to (Tabet, 2017, p. 14) renewable energy initiatives have also been taken by developing economies. Some of which have taken noticeable efforts towards solar initiatives summarized as follow: Revolving Fund and Senior Debt in Thailand, credit line for subordinated debt in Macedonia, Contingent project development grants in Philippine. Finally,(Tabet, 2017), (Hafez, 2017) and (Ghoddusi, 2015) have focused on the mechanism of financing solar farms and solar rooftops using Islamic Sukuk, also called green sukuk.

Consequently, this paper is the first initiative in Algeria which aims to present a proposal for financing an Algerian Solar Energy Station project by Islamic sukuk, using a descriptive and analytical approach. This approach is based on the collection of data from the Ministry of Energy and Mines, the data analysis and it interpretation to achieve a potential structure, a plan and a schedule for the full framework for the Islamic financing from the beginning to the end of the project.

- **One sentence question:**

In the light of what have been discussed, this study aims to answer the following question: ***How can the Islamic financial industry (through Islamic Sukuk) contribute to the growth of the Algerian economy - if implemented - by financing a solar energy station?***

- **Hypothesis:**

✓ Islamic finance is an effective financial solution to solve the government budget problems;

✓ Islamic finance is efficient in financing renewable energy projects and as a conclusion it helps to achieve sustainable development.

1- Sukuk and scope of understanding:

1.1- meaning:

Sukūk (plural of sakk), frequently referred to as ‘‘Islamic Bonds’’, are certificates each of which represents the holder’s proportional undivided ownership right in tangible assets, or pool of predominantly tangible assets, or a business venture(IFSB, 2009).

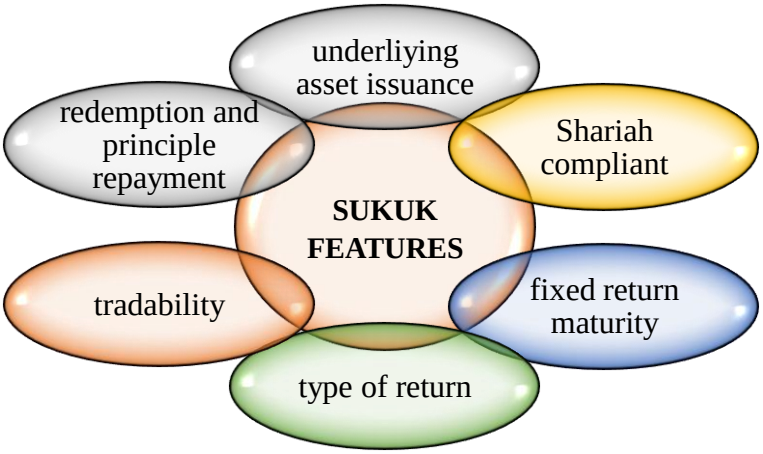
These Islamic Sukuk are derived into: Mudarabah, Musharakah, Ijara, murabaha, Istisnaa, Ijaraha, Wakalah, Al musaqa and hyprid sukuk (AAOIFI, 2016).

1.2- features:

Sukuk gain their features from the adoption of the principles of Islamic law, *Shariah*in all Sukuk functions and transactions.(Afshar, 2013) described these features as freedom from *Shariah* prohibitions, such as those involved with interest (*Riba*), *Gharar* and harmful activities e.g. beverages, pork, prohibited drugs, gambling, pornography and weapons.

Broadly, the Sukuk features have six categories, as shown in the figure below:

Figure.1 The features of Islamic sukuk



Source: by the authors

According to Mohammed (Alswaidan, 2017, p. 55) these features are:

- **Underlying asset backing**. This is one of the main differences between Sukuk and conventional bonds, and serves to secure the role of Islamic finance in servicing the financial needs of the real economy.
- ***Shariah* compliance**. This has made Sukuk widely accepted among Muslim investors around the world, which convince them that all financial operations are "Halal" and fit the Islamic principles and law.
- **Fixed term maturity**. This estimates the expected return within a specific period, and is particularly suited for the role of Sukuk in project financing.
- **Type of return**. Sukuk are classified as a long term investment with fixed return but due to their profit and loss sharing policy, they have flexible returns based on the profitability generated from the attached asset of the Sukuk. In addition, risk and return in Sukuk is customized based on Sukuk structures, since Sukuk have a different risk profile depending on their structures.
- **Tradability**. Sukuk are also tradable throughout the stock market like conventional bonds. However, this depends on the type of Sukuk.
- **Redemption and principal repayment**. Sukuk have greater security in due to being always attached to an asset.

1.3- Sukuk El Musharakah (the proposed sukuk for financing the solar farm)

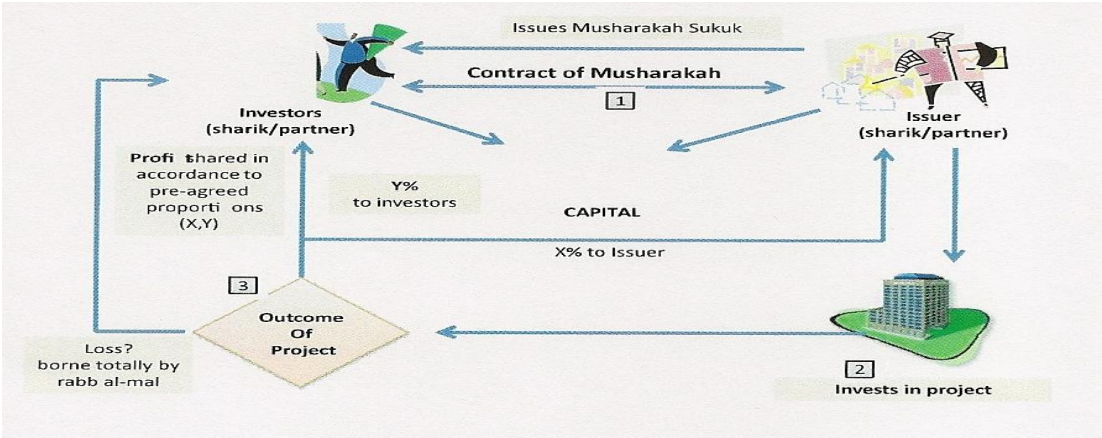
According to (Yusoff, 2005, p. 34) Sukuk Al-Musharakah are documents of equal value issued with aims of using mobilized funds for establishing a new project or improve and developing an existing one or financing a business activity on the basis of one of the partnership contracts. The certificates holders become the owners of the project or the asset of the activity as per their respective shares. This Musharakah certificates can be treated as negotiable instruments and can be bought and sold in the secondary market (Abdullah, 2014, p. 918)**.** In addition, Musharaka sukuk are divided into two types: **Shirkah al-milk** (co-ownership) and **Shirkahal´aqd** (contractual partnership where two or more persons may continue to carry on business on the condition that capital and profit will be

shared among them.)

- **Sukuk El Musharak structure**

In sukuk el Musharakah the issuer and investors will both contribute to the capital of the project. This project is managed generally by the issuer and sometimes by a third party. Otherwise, the transactions can also be structured with all investors contributing capital in this project and the nap pointing the issuer as their representative to manage the musharakah. However, this partnership can also be classified as an investment agency sukuk Figure 03 will explain briefly how Sukuk Musharakah works.

Figure 3. Sukuk el Musharakah structure.



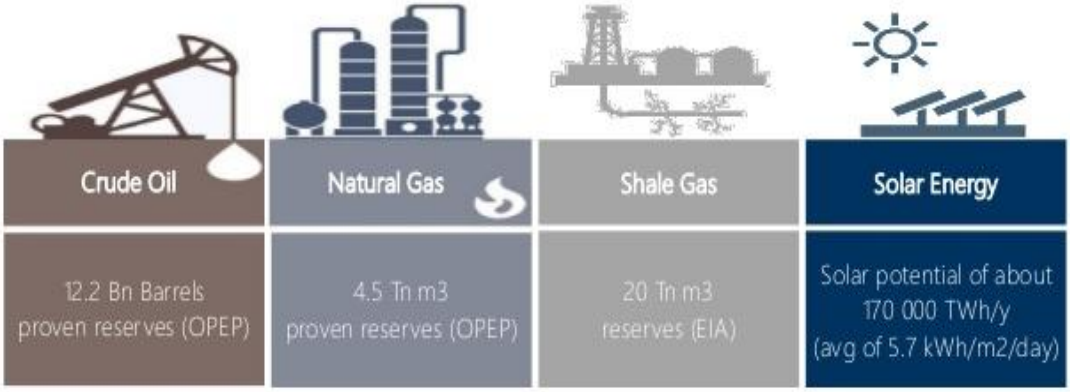
Source: NEWHORIZAN- global perspective on Islamic banking and insurance (2015)

2- The solar energy in Algeria:

2.1- Solar energy potential in Algeria:

Algeria is a leader in the world of energy and in energy markets. It is the largest natural gas producer in Africa and has the third largest oil reserves in Africa. Natural Gas in Algeria provides 95% of the power generated. Gas make less than 40% if export earnings and crude and refined oil make 55.5% amounting to over 95% of export earnings and over 30% of the country's GDP (EIA. 2016).

Figure 4. Algeria energy resources

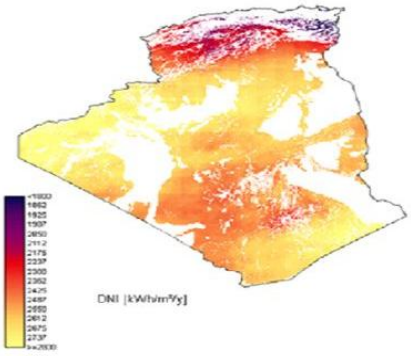


Source: Algeria-UK Investment Forum (May 2016)

In addition, a study conducted by the German space agency showed that the Algerian desert is the largest reservoir of solar energy in the world. Other studies show that six hours of the desert sun over half a million square kilometers, is enough to store electricity for the consumption of families in the European Union For a full year. (Energy, 2016). Additionally to another study, which indicates that the South of Algeria is capable of providing energy for all countries over the world according to the standard of "energy security", up to 4 times.

Figure 5. Renewable energy potential in Algeria (by region).

Regions	Coastal	highlands	Sahara
Area (%)	4	10	86
Average duration of sunshine (hours / year)	2650	3000	3500
Average energy received (kWh/m2/year)	1700	1900	2650

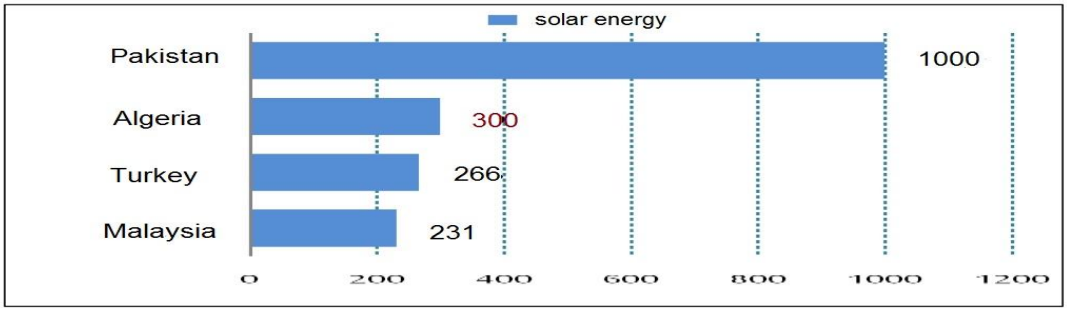


Source: Arab union of electricity.

2.2- Solar energy production and private sector initiatives:

Algeria first introduced solar energy, in 1988, into the Southern project. Algeria started preparing larger cities, like Skikda and Oran, with the adequate equipment to improve the potential of solar energy as all (Hadji, 2016 May, p. 19).

Figure 6. The generation of electricity from insolation.



Source: by the authors

From figure 05 we can notice that Algeria has generated electricity in 2015 for about 300 MW as it occupied the second rank after the State of Pakistan, whose capacity to generate electricity from solar energy is 1000 MW. Which means that Algeria's electricity production by solar technology is still very small? This has led researchers to call Algeria a sleeping giant of solar energy, while many foreign investors have expressed their desire to invest in Algeria in this field.

Moreover, According to the minister of energy and mines "Mr. Qaitouni", about 400 MWh of electricity have been completed through renewable energies, stressing that the renewable power stations, which currently exist in 22 states, operate with Algerian expertise. The minister added that SONATRACH is contributing to this ambitious program at the level of the industrial sites of the hydrocarbons sector which will provide the country about $ 2 billion by 2040 and a capacity of solar energy up to 1.3 GW to cover 80% of the needs of oil sites.

Table 3. The Algerian energy market.

The company	Year	Features
DESRTEC German company	2011 (collaboration with Sonalgaz)	The collaboration aimed at generating 100GW by 2050at a cost of about US $ 424.5 billion (€400 billion). The project was thoroughly studied and planned, and various connections were established between Algeria and European countries including Spain and Italy. However, by mid-2015, the project wasabandoned.
CONDOR	2014	- The company completed its 950 million Algeria Dinar (US $8.62 million) worth of solar PV factory with the capacity of 50 MW per year. - By the end of 2015, the company signed the first Private IPP Solar PV project in the country, with a 2 MW PV solar farm that is yet to be developed (PVTech, 13th October 2015).
Renewable Energy Partner (REP)	2013	- The company has established two projects of total 50MW by 2016, aiming at installing 200MW in the next five years (The National, 19th March 2016). Similar to Condor, REP has not provided details about its financing.

Source: by the authors from Tabet (2017)

3- Islamic sukuk funding proposal to a solar farm in Algeria :

Islamic sukuk used in funding investments in infrastructure will lead to the activation of the partnership between the public and private sectors (PPP) as governments seek to adopt partnership systems in which all sectors of society contribute to the direction, management and operation of projects and business development (Ismail, 2013, p. 10). Thus, in this proposal, we seek to suggest an initiative to finance a solar farm in Algeria depending on Sukuk el Musharaka.

3.1- The presentation of the solar farm project in Algeria and it compatibility with Islamic Finance:

- **The Identification of the region and its economic features:**

The solar farm will take place at the Wilaya of Adar, which is located in the south-west of Algeria. It has an area of 44,372 km. The reason behind choosing this region is due to its economic resources. It is considered the largest agricultural source in Algeria (agence national de développement l'investissement, 2013). In addition, Algeria has launched huge projects in Adrar, including the construction of the first petrochemical station in the continent and 8 glass factories without forgetting its charming tourist elements all this will lead to rapid demand on electricity.

Finally, this Wilaya has recently reinforced several energy projects, with three new power stations with a total capacity of 33 MW, led by Algeria's largest power plant with a capacity of 20 MW and costing the state treasury 38 billion DZD.

- **Parties to the process of sukuk issuance:**

It is divided into two parties as follow:

a- The original parties which are directly involved in the process of the sukuk issuance, and include:

❖ **The Originator or Founder of the Sukuk:**

The originator: is the owner of the assets that sukuk will be issued on their base, which aims to acquire liquidity to be used to finance its various activities through the collection of its own assets under the regulations of the securities' commission. In addition, the originator may be a company, an individual or a government, a central bank, a business, a finance company, a real estate company, an airline, etc., whether from the private, public or charitable sectors (Tabet, 2017, p. 86). However, in the proposal we choose **Condor** in the production of electric power from the solar panels, where the director of the institution Boudrbala Mouloud said that the complex of Condor has reached an advanced stage of investment in the production of solar energy using solar panels and assumed a relationship between the electricity company (Sonatrach) and Condor Complex. This

will give it the responsibility to set up a SPV based on trust between the partners, through which the liquidity and cash flows of the project will pass through, so that they will be assembled and directed according to the agreement.

Special purpose vehicle (SPV): the SPV is considered to assume legal ownership) of the underlying asset used in sukuk or securitization for the benefit of the beneficiary (whose interest or right is recognized by the court of equity). And as such a split is thereby caused to the concept of ownership as a result of which the beneficiary is not empowered to take or assumed all rights as an established owner of the asset as is required by Shariah law (Islamic law of finance, 2011). **SPV** then, have the role of Issuing or securitizing instruments through the purchase of sukuk assets from the issuing company to carry out the issuance process (structured securitization), or the issuing agent of the company established on the basis of the agency contract to invest simple securitization (Feng, 2009, p. 1112)**.**

Sukuk holders/ Investors: are the entity that wishes to buy the Sukuk offered for subscription with a view to redemption of its principal, in addition to obtaining the proceeds from these Sukuk after the end of the investment activity. Sukuk holders may be conventional or Islamic banks, local or global financial institutions, governments, individuals, etc. The institution may have an untapped liquidity that it wishes to invest in legitimate financing instruments where investors acquire solar systems by owning sukuks and receive an agreed percentage of profits and the value of sukuk at the maturity of Islamic sukuk (Afshar, 2013, p. 50)**.**

Government: The Sonatrach Corporation is the government and public sector entity of the proposed project. This institution provides the land to the developer (Condor) and we propose through this model the sharing of production costs. This method reduces the initial investment capital while preserving land ownership. The Sonatrach will receive the agreed profit rate not to enter Sunlagaz's treasury but will be allocated for the purchase of assets (solar panels on sukuk holders). As Sukuk maturity, the ownership of the solar panels will be transferred to Sunlagaz. To pay for SPV, the country is estimated to have the government's FiT tariff of $ 0.16

(PVMagazine, 2014) with the state providing additional guarantee and support for this model through the development of a legal system to protect sukuk owners.

b- **The assistant parties of the sukuk issuance**: It is agreed with them to perform special services for the process of issuance.

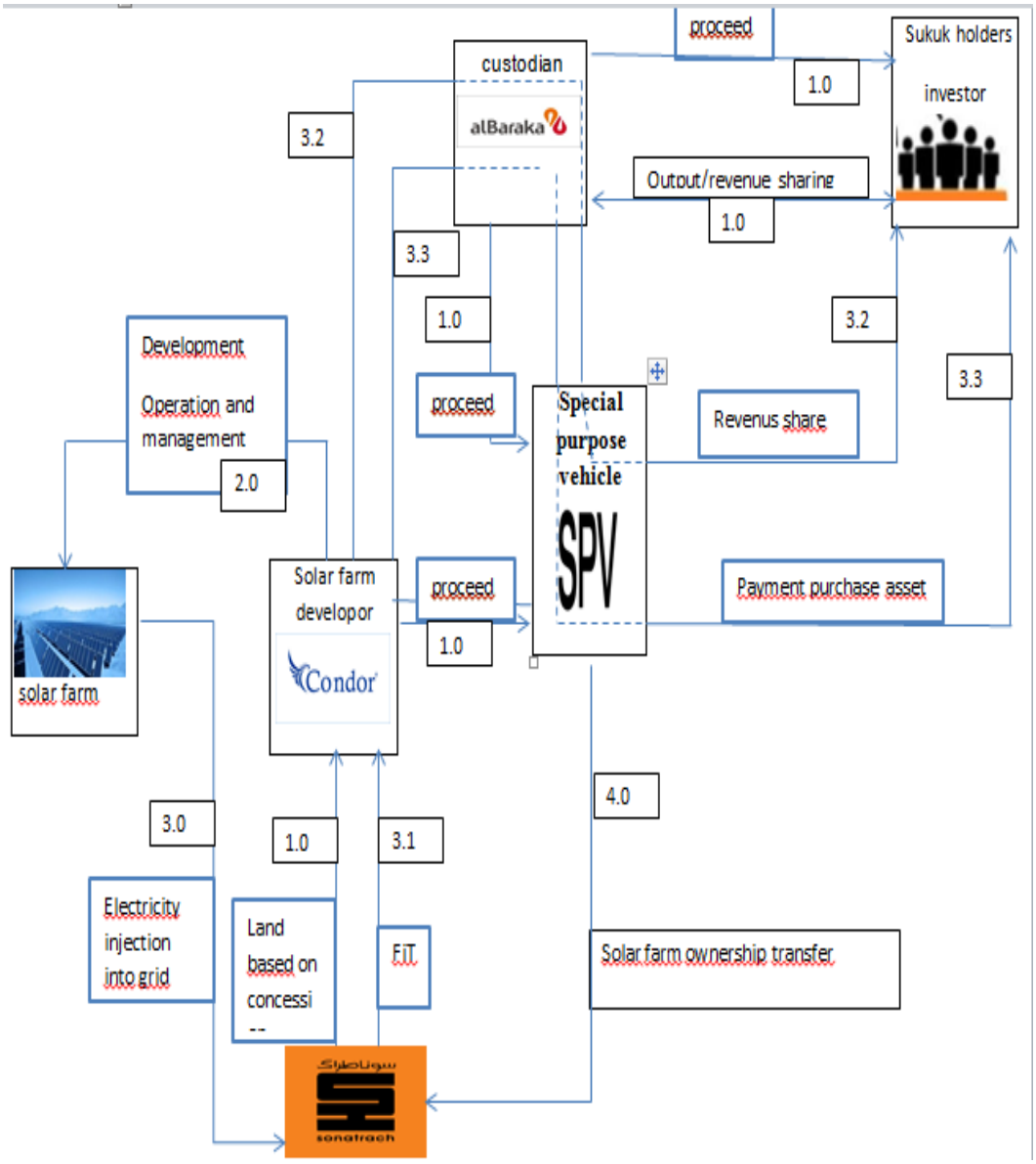
- **The trustee/ registrar:** is an intermediary whose mission is to protect the interests of the Sukuk holders, and to supervise the developer and its compliance with the conditions governing this process according to the Prospectus. It also maintains documents and guarantees. The presence of the trustee may be associated with the first arrangements for the Sukuk, and may be determined by the prospectus, and terminated by the return of the sukuk holders.
- **The Shari'a Supervisory Board**: it is one of the most important parties which assist in the process of securitization, in view of the role it plays in controlling the process of securitization, giving the issued instruments a legal form. in addition to its role in observing and providing the requirements of the Shariah provisions in studying the structure of the issue and its documents, the contracts regulating the relations between the parties. The Supervisory Board shall review all the activities and processes to be entered into, in order to determine the legality of the legalization process
- **Global rating agencies or Credit Rating Agency:**

  The laws which organize the process of sukuk issuance require that the assets must take a credit rating certificate by specialized international companies. This function is to determine the ability of the company to fulfill its obligations towards the sukuk holders, the creditworthiness of the issuances offered, the guarantees and determination of the fair price, As well as to evaluate the efficiency, credibility and credibility of the issuer in the activity of participation, and to protect the sukuk holders. Standard and Poor's, Fitch, Moody's and Islamic rating agencies are currently offering Islamic Quality Rating Service (IIRA)

in Bahrain and the Malaysian Classification Agency (RAM) to provide the international characterization of Sukuk, International markets.

- **Investment Manager**: Investment Manager, is appointed by the issuer or the issuing manager, and is advertised in the prospectus
- **Issuance Agent:** Represents the Issuer in the Release and takes the necessary action from Payment of amortization installments and accrued returns and announced in the prospectus
- **Issuance Manager**: The entity that handles the rights of sukuk holders and the supervision of the execution of the issue for a specific fee, and is announced in the prospectus.
- **Underwriters:** Under the prospectus, he undertakes to subscribe the unsubscribed sukuk and pay the rights of sukuk holders after they have been collected. This is very important for the model because the sukuk should be attractive in the market. It is advisable to be a Shariah-compliant financial institution, considering the nature of Algerian investors who avoid riba-based banks and the importance of buying unsold bonds in order to provide the developer of the solar power station with sufficient funds to complete the project.

Figure 7. Solar Output Sharing Sukuk flow



Source: by the authors

Table 4. Proposed Model Mechanism

1.0	**The land was given by the sonatrach to the développer "condor" to take a place for the solar farm and produce energy.**
1.0 Flow of proceeds and Solar Output Sharing Sukuk issuance.	Making and explaining the contact between the participating parties in the issuance structure and the project of the solar energy which are sonatrach (government), the developer (condor as à Private). In addition, it clarify the obtained percentages of revenue for each partner. Where the custodian and the SVP will issue sukuk and buy it to the investors (sukuk holders) who will own the PV, And than the revenues will be converted to the developer to set the solar farm in.
2.0 solarfarm construction	When the developer will get the needed Money to put up the solar farm, it starts in pursuing the project which needs about 12 year of maintenance
3.0 - 3.1 -3.3 Distribution of revenue to Sukuk holders:	**Once production starts and electricity is passed on to the grid, Sonelgaz (the energy buyer/payer) starts paying the amounts due from the solar energy produced/sold (on pre-contracted FiT basis) to the developer.**
4.0 Transfer of Solar farm Property to Sonatrach	Amortization of the Sukuk and transfer of ownership of the solar panels is the last step of this process. Upon maturity of Sukuk the ownership of the solar panels is passed on to the government as represented by Sonatrach.

Source: by the authors

4.2- *Calculating installments, amortization schedule and Sukuk return distribution*

In this proposed project, we will follow the approach adopted by tabet 2017, where we will assume through this model the participation of the public sector (Sonatrach), the private sector (condor complex) and sukuk holders (owners of solar panels) according to the following ratios: 40%, 9% 51%, respectively. In addition, the project needs to be built in a period from

one to three years. Nevertheless, in this proposal, and to simplify the idea we will assume that the production of solar energy will begin immediately in the first year of installation, and determine the quality of the instruments used in the project. That means that Sonatrach will own the project at the end of the Sukuk maturity and the N period proposed is 12 years old.

Sonatrach will play two roles in the project as a partner granting the land to the developer and as a purchaser of solar energy. Where, Sonatrach will buy all the energy produced and pay it through the feed in Tarif, which the government intends to issue at 0.16 usd / kwh. The sum will be paid to the developer through a SVP company who would distribute this value according to the agreed percentages. Whereby 9% will be paid to the developer (Condor), 51% will be distributed as return to the sukuk holders and 40% to Sonatrach not to its treasury but will be used to buy solar panels from sukuk holders Periodic payments.

In order to provide some data on the installation of a solar power plant, we have collected information from articles in specialized fields of renewable energy, Internet sites, the Renewable Energy Fund site in Algeria and the economic feasibility of some similar projects in foreign countries.

The main components and features of our proposed project are:

1 - The period of amortization of the Islamic Sukuk and its maturity is of 12 years, while the life of the solar energy farm is up to 30 years;

2 – the Solar farm capacity is about 1350 MW, and will require 3857143 solar panel, where we will use the solar panels with a capacity of 350 w/PV;

3 - The cost of setting up a solar Farm with a capacity of 100 MW is about 211 million dollars (pv maguazine, 2018), so the cost the solar farm with the capacity of 1350 mw, that Algeria intends to launch will cost about 2848500000 USD;

4 -The benchmark of solar farms area needed is 3 Acres per MW (Ong, Campbell et al. 2013), The solar farm needs the capacity of energy to a large area, up to 4050 acres;

5 - Production of a solar panel of 350W is about 670kw / h (pvwatts, 2018)

and by multiplying this value in the number of solar panels we get the total capacity of the solar power station and about 2584285810 kw / h during the year;

6 - The FiT which Sonatrach would pay is an average of US $ 0.16 / kWh is assumed fixed throughout the period (PVMagazine, 2014). This gives a gross revenue of $ 376272013.9.

Table 5. Model Cash Flows Estimation (US/$)

	1	2	3	4	5	6	7	8	9	10	11	12	total
Investementsukuk	2848500000												2848500000
Revenu	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	413 485 729,60	4 961 828 755,20
yearly payment to Sukuk holders	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	376272013,9	4515264067
Share to Sukuk holders (51%) of gross revenue	210 877 722,10	199300121,7	194338292,9	177798863,7	161259434,5	144720005,4	128180576,2	111641147	95 101 717,81	78562288,62	62022859,44	45483430,26	1 609 286 459,60
Part of share to Sonelgaz 40% (paid to Sukuk holders for asset buying)	165 394 291,84	176971892,3	181933721	198473150,2	215012579,4	231552008,6	248091437,8	264630866,9	281 170 296,13	297709725,3	314249154,5	330788583,7	2 905 977 707,63
Share to developer 09%	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	37213715,66	446564588

Source: by the authors

The results in Table 05 are calculated as follow: revenues were divided into percentages and only 51% will go to the sukuk holders as their return, the Rate of Return of Sukuk holders is computed by the following formula:

r = 0.51 * energy produced * KWh price at the grid/initial investment

r = 0.51 * 2584285810 * 0.16 $/ 2848500000

r=0.074 r = 7.4 %

In addition, table 05 shows the ratio of annual flows, the distribution of Sukuk yield and the purchase of Sonatrach solar panels from sukuk holders. It is worth mentioning here that the amount of money that Sonatrach will use to purchase the panels will be added to his return each year in the purchase of solar panels, and thus the process will continue to the end of the sukuk maturity period and extinguish it. Sonatrach will finally be the owner of the project, where it can enter into a new contract as the owner of the project with the developer for the maintenance of the solar system.

Table 6.Sukuk holders' revenue and sale/purchase Schedule of PV Solar Panels to sonatrach

	payment	Value of Solarasset	Revenue Share	Price of Panels Sold	end value
1	376272013,9	2848500000	210 877 722,10	165 394 291,84	2683105708
2	376272013,9	2 683 105 708,16	199300121,7	176971892,3	2506133816
3	376272013,9	2 506 133 815,89	194338292,9	181933721	2324200095
4	376272013,9	2 324 200 094,87	177798863,7	198473150,2	2125726945
5	376272013,9	2 125 726 944,66	161259434,5	215012579,4	1910714365
6	376272013,9	1 910 714 365,27	144720005,4	231552008,6	1679162357
7	376272013,9	1 679 162 356,69	128180576,2	248091437,8	1431070919
8	376272013,9	1 431 070 918,93	111641147	264630866,9	1166440052
9	376272013,9	1 166 440 051,99	95101717,81	281170296,1	868730326,7
10	376272013,9	868 730 326,68	78562288,62	297709725,3	571020601,4
11	376272013,9	571 020 601,36	62022859,44	314249154,5	330788583,7
12	376272013,9	330 788 583,68	45483430,26	330788583,7	0

Source: by the authors

An important point to note is Investors' capital redemption. Since there will be a transfer of ownership at maturity to sonatrach, it would take its share of revenue as payment to Sukuk holders for purchasing their share in the solar farm.

Conclusion and policy implications

The world has recently known a strategic shift in energy from sources to the adoption of renewable energy. This puts Algeria in front of the inevitability of preparing for the possible alternatives for the post-oil period. Where, the interest in renewable energy is for its importance in preserving the environment and the climate. However, the government is struggling with the funding problem that could be fixed by the exploitation of Islamic finance through Islamic sukuk, which has great potential to finance renewable energy projects in Algeria.

This is because the benefits of Islamic sukuk, the features of these kind of projects as the low costs due to the development of the field of energy and renewable. In addition, the returns of this investment are fixed as energy prices are stable and not affected by the fluctuations of international markets. All this made us believe that Algeria is a sleeping giant in the field of renewable energies and Islamic Banking. If there is political will, Algeria will soon become the capital of renewable energy and a global Islamic financial center.

Results and recommendations

- **Results:**

1 - Achieving a project of this size and similar projects in renewable energy can increase the Algerian economic performance and reduce the pressure on the electricity companies in Algeria.

2 – This project will maintain jobs in the installation and maintenance of the solar farm, the isolation of desert villages and achieve comprehensive local development in the desert of Algeria, where 86% as the energy engine for all industries and projects.

3- Islamic finance is the most important alternative to traditional financing in covering the budget deficit and reducing the deficit gap in

Algeria. It will also contribute to the investment of funds outside the banking system, estimated at billions of dollars due to fear of the interest system.

4- Islamic instruments are one of the tools of Islamic engineering and have great potential in building the infrastructure which is the backbone of the economy especially the sustainable energy projects.

5 - The contribution of all sectors of society from the public sector through private partnerships (ppp) in the direction, management, operation and development of projects by exploiting Algeria's enormous alternative energy potential.

- **Recommendations**

1- Encouraging investment in the renewable energy sector and taking advantage of the international expertise and experience in this field.

2 - Training competencies and frames in renewable energy technology and in the field of Islamic banking, which has made itself a name and position in the world as the fastest growing financial system in the world.

3 - The development of a framework and legal legislation that defines how and how to deal with instruments while providing security and protection to users of instruments.

4 - Exploitation of renewable energy as an alternative to the sector of oil and gas and the conversion of the desert of Algeria to the cities and villages of tourism and industrial exploitation of Islamic instruments in the construction of infrastructure, roads, airports, etc., to promote the Algerian economy.

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Territorial Promotion's Influence On Territorial Attractiveness Development In Algeria: Institutional Actors Discourse Analysis

Kamila AIT YAHIA[1], Hichem-Sofiane SALAOUATCHI [2]

[1]Ecole des Hautes Etudes Commerciales (HEC), MPI Laboratory, Algeria,
k.ghidouche-aityahia@hec.dz

[2] Ecole des Hautes Etudes Commerciales (HEC),MPI Laboratory, Algeria
& Université de Côte d'Azur, GRM, France
hs.salaouatchi@hec.dz

Received: 15/07/2018 **Accepted:** 02/12/2018 **Published:** 23/01/2019

Abstract

This contribution analyzes the impact that territorial promotion could have on improving attractiveness and territorial competitiveness in Algeria. The results of a qualitative study conducted with institutional actors in Algeria identified inadequacy of current actions in territorial promotion with the expectations of foreign investors.

Keywords: IDE; attractiveness; territorial promotion

JEL Classification Codes: M31, M38

ملخص

يسعى هذا المقال إلى تحليل أثر الترويج الإقليمي على تحسين الجاذبية والقدرة التنافسية الإقليمية في الجزائر. توصلت نتائج الدراسة النوعية للبحث بعد القيام بمقابلات مع الفاعلين في المؤسسات الجزائرية إلى عدم كفاية الإجراءات الحالية في الترويج الإقليمي مقارنة بتوقعات المستثمرين الأجانب.

كلمات مفتاحية: الاستثمار الأجنبي المباشر، الجاذبية، الترويج الإقليمي

Corresponding author: SALAOUATCHI Hichem Sofiane, **e-mail**: hs.salaouatchi@hec.dz

1. INTRODUCTION

The concept of attractiveness is defined as a territory (or a place) ability to attract and to retain companies. So, a territory is not attractive only because of its location generic factors (skilled labour force, natural resources, etc.), a territory is attractive because of its specific territorial characteristics (successful suppliers, specific research and development, etc.) and its proximity to other companies or to other territories.

The links of (cultural, geographical, colonial, etc.) proximity between company and territory, are also considered in the choice of the location. The various local politics, in particular, those concerning economic aspects such as tax incentives represent an important lever but remain insufficient to optimize territorial attractiveness.

Thus, every place committed politics to strengthen their most dynamic competitiveness clusters and encouraged synergies to offer to territories and places a better ability to adapt with economic evolutions. For all these reasons and in order to differentiate from themselves from each other, many places relied on marketing logic to improve their attractiveness.

The territorial marketing or place marketing aims at building and at creating a beautiful image to places or regions to attract potential investors. This activity is generally driven by promotion agencies designated by public authorities (Gollain, 2008, p. 4).

It seems interesting to approach territorial marketing issue as a compared analysis between places' (or territories) practices (which try to attract investors and support located companies' development) and companies' practices (which look for new setting-up or want to develop themselves by using available resources), within a complex environment with constraints and opportunities, systems of influence and networks between the concerned actors.

Our research object is to highlight the territorial promotion importance and its effect on Algeria territorial competitiveness development and attractiveness. We will also identify techniques and methods to set up by local stakeholders, to optimize the territorial attractiveness of Algeria.

This work reports implementation modalities of a place marketing approach with institutions and local stakeholders who participate in the territorial offer achievement process.

So, our research question is: what is the institutional actors' perception toward territorial promotion within territorial politics led by public authorities on a national scale (and in particular the ANDI (National Agency for Investments Development)? ANDI is considered as an important stakeholder of the territorial dynamic and a significant instrument which influences territorial promotion.

Our research methodology based on a literature review and a qualitative study. The choice of the qualitative approach as method of information collect is explained by the fact that it is perfectly advisable to reconstitute past events (the reality of territorial politics in Algeria, territorial promotional practices), to understand territorial actors' actions and to analyze the meaning these actors give to their practice.

2. LITTERATURE REVIEW

Researchers began to be interested in territorial marketing and place branding from 1970s (Kavaratzis, 2004, p. 59). Kotler & Levy (Kotler & Levy, 1969, pp. 10-16) and Hunt (Hunt, 1975, pp. 1-7) are considered as pioneers in that field (Vuignier, 2016, pp. 9-10). In the 1980s and in the beginning of 1990s (Ashworth & Voogd, 1990, p. 3), the researchers still wondered about the relevance of this discipline and about the fact that territories could be "sold" as products ((Ashworth & Voogd, 1990, p. 3); (Matson, 1994, p. 38)). It's only at the end of 1990s, during the annual conference of travel and tourism research association in 1998 that the territorial marketing was able to win in visibility (Hanna & Rowley, 2008, p. 63).

Since decade, researches in territorial marketing and place marketing are constantly evolving, as shown by Vuignier (Vuignier, 2016, pp. 12-14)in his literature review, the subjects are various and touch as well place image, town and country planning or urban politics and planning.

Territorial marketing represents, one of the most appropriate methods in place management and promotion ((Page & Hardyman, 1996, pp. 161-

162);(Greenberg, 2008, pp. 21-22)). To improve its attractiveness and draw investors, visitors and residents, places have use tools and specific methods which establish the corpus of the territorial marketing. A field of research which shows similarity with classical marketing. but also some differences.

The aim of this section is to highlight the specificities territorial marketing, (place marketing) through a particular clarification of this concept and other related concepts such as the territorial branding (place branding) or the territorial promotion (place promotion).

2.1. Definitions and related terminologies

Gollain(Gollain, 2008, p. 4), defines the territorial marketing as *"The effort of territories valorization to competitive markets, to influence, in their favor, public behavior by a sustained perceived value which is superior to competitors. This activity is generally driven by development agencies for public authorities or for private actors."* This global and wide definition includes all kind of efforts: strategy, promotion, branding, events to develop a sustainable place and incite various public (stakeholders, residents, visitors, students) to affect their behavior (settle down, visit, recommend, form image). This approach is mainly led by the local actors (communities, chambers of commerce …) and implemented by specialized bodies (promotion agencies, tourist office, competitive clusters.

The definition of Hatem (Hatem, 2007, p. 11)focused on investors and puts forward the commercial purpose of this practice is: "*the territorial marketing (place marketing) aims at inciting external actors to enter into business relationships with local actors, in particular by establishing on this place."*

Vuignier (Vuignier, 2016, p. 9) held Eshuis, Klijn & Braundefinition because it focused on customers participation: "*coordinated use of marketing tools supported by a shared customer-oriented philosophy, for creating, communicating, delivering and exchanging urban offerings that have value for the city's customersand the city's community at large."*(Eshuis, Klijn, & Braun, 2014, p. 156)

From all these definition, we can see that territorial marketing is an

important and essential tool for territorial management and development (Noisette & Vallerugo, 2010, p. 158) not only through promotion, but also through proprieties valorization, services, business sectors, inhabitants and all organizations which operate in these places. So, in a territorial marketing logic, the whole territory is a "product" (Kotler & Gertner, 2002, p. 250) and it is an economic active subject (Bagautdinova, Gafurov, Kalenskaya, & Novenkonva, 2012, p. 180).

Place's attributes diversity (local characteristics, development potential, geographical opportunities, tourist potentials, culture, heritage …) makes that in the current economic environment, territorial marketing becomes an essential promotion tool. Its methods are inspired from "company" marketing (Brossard, 1997, p. 15), and are used as support to urban politics to improve places for their public, investors, citizens or tourists (Boisen, Terlouw, Groote, & Couwenberg, 2017, p. 6).

However, some authors as Chanoux & Keramidas stressed on the criticisms sent to territorial marketing by some researchers who pretend that it's not a real research field because it's closely connected with local politics and public management (Chanoux & Keramidas, 2013, p. 5), others blame place marketing due to the lack of methods and knowledge based on empirical studies as well as some conceptual confusions ((Kavaratzis, 2005, pp. 329-342);(Noisette & Vallerugo, 2010, p. 133)).

Territorial conceptual confusions were discussed by several authors, they explained that "territorial marketing" (place marketing), "place promotion" and "place branding" are often used as if they were synonymic and even when they are not used as synonyms, they are a different understanding and interpretation according to people and places(Boisen, Terlouw, Groote, & Couwenberg, 2017, p. 5).

2.2. The territorial promotion (place promotion)

In the literature, "promotion" is one of marketing mix P's, it is also a territorial marketing and territorial branding tool ((Ashworth & Voogd, 1990, p. 65); (Boisen, Terlouw, Groote, & Couwenberg, 2017, p. 9)). Territorial promotion dresses a particular interest because it represents a great part of territorial marketing actions engaged by the "professionals"

and the "territorial actors".

Territorial promotion involves the use of diverse marketing and communications techniques. Territorial communication has for objective "to make decision *readable and understandable, to show its sense, its ambitions, its consequences. It has also an additional roles: inform, promote a place, mobilize actors, decision-makers and citizens, liven up local democracy*"(Mégard, 2017, p. 35). According to the chosen target, territorial promotion could address inhabitants, investors, and tourists, by exploiting the various techniques of communication (above the line ATL and below the line BTL).

At the end, researchers conclude that territorial promotion is guided by what a territory has to offer, it has for purpose to draw attention and make a place or a destination known (cognitive aspect).

Place branding: this concept is often misunderstood (Anholt, 2005, p. 117) and have been the object of different interpretations(Noronha De, Coca-Stefaniak, & Morrison, 2017, pp. 92-93), some researchers think that place branding is a part of the territorial marketing while others think the opposite (Boisen, Terlouw, Groote, & Couwenberg, 2017, pp. 9-10).

Some American authors use indifferently both concepts (Vuignier, 2016, p. 16). Braun(Braun, 2008, pp. 22-23) describes this concept as being a "symbolic construct aims at bringing value to a territory". He explains besides, that Branding is a new step of territorial marketing. Vuignier talks about a new era. So, we can notice that branding is linked to brand management, positioning, identity, image, fame and to formed associations formed in various targets mind (Vuignier, 2016, pp. 7-8).

Place branding purpose is to maintain and\or to improve a territory reputation; it is guided by "identity" and aims to develop public emotional feelings (Boisen, Terlouw, Groote, & Couwenberg, 2017, p. 7).

As expressed before, territorial marketing is guided by the public target needs and concerns in order to meet at best their requirements, so that they will choose this place (for living there, or visiting, or investing there). It is clearly connected with territorial promotion (place promotion) and

place branding but should be studied separately(Govers, 2011, p. 230). The table below summarizes the three concepts:

Table 1. Distinction between territorial promotion, place branding and territorial marketing.

Territorial promotion	*Place Branding*	*Territorial marketing (place marketing)*
Guided by the offer	Guided by the identity	Guided by the demand
Aims at communicating the place offer.	Aims at managing and at adapting the offer to the public needs	Aims at managing the image and the reputation
Allows to draw the attention	Allows to make a choice	Allows to build a reputation
Cognitive objective (knowledge).	Conative (Behavioral)objective	Emotional objective (attitude)

Source: (Boisen, Terlouw, Groote, & Couwenberg, 2017, p. 8)

2.2. Comparative approach of territorial promotion practices

Benko (Benko, 1999, pp. 96-99) highlighted four factors which widely contributed to territorial marketing development: first of all he quoted globalization, then, decentralization in public stuff management, ICT (information and communication technologies) fast growth and the necessity of adapting marketing principles to a new scope such as places.

Actions taken within territorial marketing framework aims at improving territorial attractiveness (Bagautdinova, Gafurov, Kalenskaya, & Novenkonva, 2012, p. 182). Territorial promotion is centered on local resources exploitation and valorization. One of the prime objective of territorial marketing is to attract investors' interests. Besides, place "customers" in territorial marketing have different interests and needs (Hatem, 2007, pp. 14-17): some of them are interested by quality of life whereas others are mainly directed to the economic potential of the territory.

The literature indicated that the first "place promotion" practices would go back up in the middle of XIX ^{e} century, when in the West of the United States, campaigns of marketing were implemented to attract populations towards farmlands(Ward, 1998, p. 12). Initially organized to attract farmers and residents, these practices propagated to attract investors, decision-makers and tourists (Meyronin, 2008, p. 361).

In Europe, by 1875, tourist regions (sea, thermal resorts or mountains), were the first ones to spread efforts to attract visitors. However, the progressive appearance of promotion agencies in several developed countries gave a more structured and more elaborate dimension to place promotion actions, by different tools mobilized to attract investors and foreign capital.

It is in Ireland in 1969 that one of the first promotion agencies was created (Industrial Development Authority "IDA"). Towards the end of 1970s and in the course of 1980s, the movement increased in Europe with the creation in 1977 of Invest in Britain Bureau (IBB), in Great Britain, and in 1978, Netherlands Foreign Investment Agency (NFIA) in Netherlands, and Datar in France in 1963, but which was really active in investors' attraction since the second half of the 1980s (Brossard, 1997, p. 67).

There are several approaches for territorial marketing. American model spreads a pragmatic vision: According to this model, the main territory objective is "to sell" what it possesses in whom is the most interested. We are in a sell approach. As for European model, it is based on attractive place building and by involving various public actors and considering territorial constraints (cultural, administrative and social).

The third approach is based tourist marketing foundations, which is defined as "*a systematic and coordinated tourist adaptation of the corporate policy, as well as the private tourist politics and government, on local, regional, national and international plan, to an optimal satisfaction of needs for a defined group of consumers, while obtaining an appropriate profit."* (Krippendorf, 1971, p. 76). From this perspective results and benefits depend on place image, communitarianism, logistic offer and place accessibility.

It is also in 1977 that New York city threw the famous "I love NY", afterward numerous European cities built branding strategies through slogans and logos such as "I Amsterdam", "Only Lyon" or "Be Berlin".

2.3. The institutional practice of the territorial promotion: current situation in countries from the Maghreb and in Egypt.

In the Maghreb, the forerunner in territorial marketing practices was Tunisia, which, from the beginning 1970s, moved towards a liberal politics based on private initiative and insertion into the global economy. Thus, the law of April 17th, 1972 granted to foreign companies' free importation of goods that are necessary for their production and a free transfer of the realized profits. This law, also allowed the creation of a Investments promotion agency (IPA) in 1973. This agency had for mission the implementation of a promotion governmental policy in the industry sector.

As an example, we can quote Mfcpole Monastir, this competitiveness clusters management company was created in 2006, it has for mission management, promotion and attraction of investments, to develop an ecosystem of growth and implement a specialization strategy impulse by Tunisia around the textile industry and Clothing by targeting expanding activities. It is also in charge of innovation animation and support technology watch, incubation and frame of project leaders.

In order to promote Mfcpole clusters, the company developed a national and international campaign based on a range of marketing tools, also, to be sure to reach its targets, this agency partially outsourced this activity to a marketing agency.

Among these numerous tools, we can find: brochures, Website, promotional movies, lobbying with press or chambers of commerce. In addition, Mfcpole holds to its credit numerous proactive actions, such as special events (example: Mod'astir 2014), open days, or press conferences with journalists targeted for their sectoral skills in clothing industry. it also published a specialized article and an advertising insertion every month in national and international specialized magazines (newspaper of textile, the annual report of Oxford Business Group on Tunisia …).

Until 2009, Morocco didn't have properly an investments promotion agency, but it had rather an investments Division (ID), under control of the economic and corporate business ministry, and regional Centers of investments, which depends on the interior ministry.

It was these organizations that until then, were responsible for promoting and attracting FDI. In January 2009, a law project of Moroccan agency for investments development (AMDI) creation was adopted. This new structure's main mission was to promote investments and carry out advertising and marketing campaigns to spotlight investment opportunities in Morocco.

As for the Egyptian experience regarding territorial promotion, it comes into effect at the beginning of 1990s, in this period, Egypt committed an important program of economic and structural reforms. a fiveyears plan of economic and social development 2008-2012 gave the priority to the high-growth industries (manufacturing industry, BTP, tourism, ICTS), and in the creation of small and very small companies to favor employment. This plan placed private local investments and foreigners in the center of its development strategy, so about is the business sector, the 100% detention of the capital as well as the repatriation of the profits are authorized.

The agency in charge of facilitating investments process is the GAFI (General Authority for Investment and Free zone). A law had planned the automatic approval for investment projects in priority sectors quoted above. Upper Egypt is the object of a specific program regarding its significant development potential (workforce, natural resources, diversified economy). Indeed, the investment in this region benefits from additional benefits such as the free access of grounds, technical support of industrial center modernization or training support and access to technological centers.

Investment firm in Upper Egypt (Upper Egypt Investment Company) was created from the GAFI's. This body has for mission to identify the opportunities, to make feasibility studies and facilitate investment projects in administrative way specifically in the priority sectors. Among the used marketing tools, the Web site, www.ueico.com, is esthetic and answers the rule of 3 clicks[1], it's available in English and in Arabic, and offers a just balance between promotion and information.

As for marketing measures, the UEICO uses pull and push strategy at the same time even if the demand was weak in Upper Egypt, then this body

concentrates on local targets, in particular actions of doorstep selling and prospecting of companies based in Cairo. Besides the UEICO got ready to throw a campaign for a greater visibility but it was aborted because of the political situation of the country (the Egyptian revolution in 2011).

In Algeria, the ANDI, was born in 1993, while the country was in full economic transition. This body which was set up to be an essential tool in the economic change was known in its early stages under the naming of APSI (Agency for the promotion, the support and the follow-up of the investments). It is only in 2001, further to the modifications of the institutional frames, APSI was dissolved, and Andi was created by presidential order.

Fundamentally, as we have just seen it, new objectives of the territorial management establish the base of searching new methods, management tools, even adaptation of the commercial practices to territorial management field. The use of marketing theory in place management allows to redefine the objectives of management. In the modern territorial management, a key indicator of the success is to meet the economic needs of territories by being more competitive and more attractive compared with a regional, even world, more and more important competition. It is the challenge, in particular for a country as Algeria regarding attractiveness of the Foreign Direct Investments (IDE).

In what follows we shall present the results of our investigations on the practice of the territorial marketing in Algeria. We are not going to analyze Algerian politics regarding territorial attractiveness, but we are going to study the practices regarding territorial marketing at the level of territorial politics actors in Algeria, in particular the ANDI.

3. METHODOLOGY

Our first study is based on the exploitation of the results of a qualitative study. We have chosen the interview as a method of collecting information because it is perfectly suited to reconstruct past events. This approach has been coupled with interviews with experts and consultants to shed light on investment particularities in Algeria and helped us define scenarios for setting up a marketing approach in implementing policies to

improve territorial attractiveness.

Our interview guide is composed of four parts; the first two provide general information about the organization and the interviewee, the third part includes various questions for investors as well as for promotional agencies and public authorities, their answers that we will measure the degree of compatibility with investor expectations. Finally, the last part is mainly intended for promotional agencies to highlight the various marketing actions carried out by them to attract investors.

We chose to ask open questions regarding the diversity of the interviewees and specially to allow them to express themselves as freely as they wished, so we could drain a considerable amount of information and enrich our knowledge on some unknown sectors.

As for the duration of the interview, it was initially set at about thirty minutes, however, we must specify that some interviews lasted much longer. At the end of each interview, we made a report, reviewed and commented by the interviewees.

Respondents were selected for specific reasons: the main one being their experience and knowledge of the investment problem in Algeria. Thus, the interviews were carried out with the following actors:

The objective pursued through these interviews was to identify, in a general way, the process followed by companies in terms of choosing a place of investment, but also to have an idea of the motivations and constraints of investment in Algeria according to their point of view. In order to proceed to the processing of the results we chose content analysis method, being a technique, which allows objective, systematic and quantitative description of the contents of interviews, to interpret them.

Most of the interviews took place face-to-face on the premises of the organizations we considered relevant. However, to respect the anonymity of the interviewees, we will not mention their names or their functions, we will only stick to the name of the organization and the sector of activity in which they practice. This first phase of the interview was aimed at getting to know the organization better and identifying the main pitfalls

encountered in the work. This second phase of the interview aimed to assess the determinants of investment in Algeria, as well as the priority sectors to be developed. The table below counts the respondents according to the category to which they belong:

Table 2. Summary of interviews conducted.

Categories	Number	Type of organization
Institutional actors	6	ANDI Ministry of Spatial Planning and Environment. Ministry of Industry and Investment Promotion
Other	2	Consulting firm, experts.

Source: investigation of our research

4. RESULTS AND DISCUSSION

To the question concerning the strengths that contribute to the attractiveness of the territory in terms of FDI, the experts raised many points, which can be summarized as follows:

- The geostrategic position of Algeria and relative stability.
- Economically new country with many projects in prospect.
- The many guarantees offered to foreign investors.

To sum up the opinion of the interviewees, the growth of the country as well as certain regulatory and fiscal aspects, make that Algeria has some significant advantages compared to other countries. About issues relating to weak points and obstacles that may penalize or slow the attractiveness of FDI in the territory, the experts identified three essential aspects: The regulation and functioning of the Algerian administration (bureaucracy); Land and the living environment.

Thus, we can see that the living environment has an important place and can contribute to the disinterest of a given territory. Subsequently, we looked at the sectors to be developed in Algeria, and the respondents gave their opinion on the following four priority sectors: Agriculture, tourism and real estate, oil and petroleum sector and the pharmaceutical sector

The experts explain the choice of these sectors by the size of the area,

the many existing natural potentialities, the favorable climatic conditions and the wealth of the heritage, moreover one of the consultants found it regrettable that the Algerians preferred to spend their holidays in Tunisia, lack of sufficient and adequate infrastructure in their own country.

Two other consultants mentioned the drug market, which continues to show promise, especially with the new texts put in place. Subsequently, we looked at the neglected or less attractive sectors than the previous ones, and here three sectors were identified: the first being the services sector in general, the second that of construction and building and finally the research and development, we present below the answers of the experts.

The sentence "unattractive" a little disturbed the interviewees, they found it a bit too hard and reductive. They have therefore explained the nature of their responses: mentioning, for example, renewable energies or the service sector does not mean that these sectors are not interesting, just foreign investors are hesitant to embark on these fields. In addition, one of the consultants interviewed translates this "reluctance" by the following elements:

- Lack of heavy expertise in the building and insufficient skill level;
- The non-existence of the notion of "export of service";
- Lack of medium or long-term plans, leaving investors unclear;
- Administrative red tape;
- The average banking system.

This phase was intended to find out the point of view of our interlocutors on the marketing actions carried out by the State through its various institutions. In this regard, the interviewees made a rather positive assessment of the performance of promotional institutions in Algeria, and they cited, as an example, the efforts made by ANDI to this end. The table below shows the answers of respondents about the role of promotion agencies in Algeria:

Thus, it appears that the role of this type of organization is decisive, and that it is a good tool, since it makes it possible to present the country at forums abroad, to trace information back to the ministerial hierarchy and

advising the government on laws and regulations that reflect investor expectations.

As said before, most of the experts (67%) believe that ANDI plays effectively and fully its role of promoter of investments, the rest did not wish to pronounce themselves on the subject.

They quoted as an example the wealth of information available on the website, but also the other promotional tools including the multilingual "movie" broadcast by the agency on the occasion of economic events organized in Algeria or elsewhere.

However, interviewees think that there is no better communication action than another, they are rather complementary, so the table below illustrates what the consultants say about the best way to communicate on the destination Algeria in matter of FDI.

- Among the most frequently cited responses are the organization of events (30%) and advertising (26%). And according to the people interviewed, the organization of events seems essential in territorial marketing because of the importance of creating links with investors, assessing their needs and identifying the obstacles they encounter. In third place is the website, indeed this means allows the investor to find general information on the country, and provide him with a first glimpse of the situation.

Our interlocutor of ANDI wished to explain to us the choice of these means of communication to target the investors as well as possible:

- The development and publication of brochures range from general information on the country to thematic brochures, or by sector of activity. This documentation, written in French and Arabic, is delivered to the following addresses: embassies, state institutions, executives who travel abroad, as well as to all those who present themselves and who seek to learn about the potentialities and advantages granted.
- Even if ANDI does not organize fairs or fairs itself, this agency makes sure to be present at all events likely to attract local or foreign investors.

- To be in tune with tax and customs administrations, ANDI organizes seminars throughout the national territory, in order to agree on the publication and application of incentive schemes.
- Seminars are also organized across the national territory to raise awareness among local investors, and to inform them about the role of decentralized one-stop shops (UGDs) and the benefits they could benefit from.

She concludes that such meetings are essential in territorial marketing because of the importance of creating links with investors, assessing their needs and identifying the obstacles they face.

Also, to answer the question of what were the best actions, our interlocutor quotes as an example the organized seminar and the grant awarded following the measures taken in 2009 forcing the foreign investor to make a partnership. This operation raised 165 projects.

Regarding promotional strategies in Morocco or Tunisia, she explains that these two countries have a longer experience, since their promotional agencies exist since the 1970s. Moreover, unlike our Moroccan and Tunisian neighbors, ANDI does not does not have an international network, and can not target investors at source.

To conclude, we asked our interviewees to comment on the following quote: "A territorial marketing policy is the basis for any development of foreign investment promotion actions? Comment.

Apart from the people working in the promotion agencies, the experts interviewed were quite skeptical, they explained that even if the territorial marketing actions and especially the communication actions have a role to play, this can not be in any case determining or constituting a sufficient condition to attract an investor to a given territory, if he did not have real competitive advantages.

For our interlocutor of ANDI, much remains to be done to develop and disseminate the image of Algeria abroad. But Algeria is also an important area, and the priority is to promote certain areas to local investors in the first place.

That said, according to her, many organizations can be solicited to promote Algeria abroad, such as Algerian embassies. This is the reason why ANDI organizes training sessions for diplomats who have recently completed their studies, so that they can answer the main questions of potential foreign investors if they present themselves.

To close this interview, the official made it clear that doing territorial marketing for Algeria did not mean reproducing or copying exactly what is being done by our Moroccan and Tunisian neighbors. However, nothing should prevent the exchange of experiences and good practices in this area, which is why it is important for ANDI to cooperate with other agencies by joining several associations (WAIPA, World Association of investment promotion or AFRICANET, association of African investment promotion agencies).

5. CONCLUSION

The results of our investigation lit us on the investors' motivations who comes to develop in Algeria, and it is clear that the economic characteristics are an undeniable factor for this region attractiveness. However, our analysis also shows that the investors under estimate agencies, and do not grant them a big interest, and it throughout the process of setting-up. This indifference is translated by an inadequacy between the expectations of the investors and the services offered by the agency. It is the reason why the agency should show more initiative, by referring more to strategic and operational tools of territorial marketing.

The Algerian market presents real opportunities and comparative advantages which encourage foreign investments. Nevertheless, this interest is distorted by the incentive measures of the investments, in particular those carrying on: the improvement of the environment of the affairs, the labor market, the design of the industrial parks, the functioning of ANDI …

This last point was strongly highlighted by the set of the investigated companies, with in particular the negative appreciations concerning the quality and the quantity of the information freed by the ANDI, and little of interest which grant the investors, in their decision of setting-up, to the support brought by the ANDI.

As for the managerial contributions, this work could useful to diverse actors (institutional, private bodies, ministries) of the investment in Algeria, who could exploit, in a more widened dimension, the conditions of implementation of a real marketing approach. It is a question, indeed, of making them known the determining criteria of the investment in Algeria and the implications which it could engender in the way of designing a politics of territorial attractiveness.

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ICT in Algeria: Reality and Prospects

LAHMAR Abbes [1], BENZIDANE Hadj [2]

[1] University of Mostaganem, Algeria, (abbess.lahmar@univ-mosta.dz)

[2] University of Mostaganem, Algeria, (ben_zidane@livea.fr)

Received: 02/09/2018 **Accepted:** 07/12/2018 **Published:** 23/01/2019

Abstract

Many countries in the Developing World, including the least developed ones, are making significant investments in ICT (information and communication technology),even with very limited financial resources and weak incomes of these nations, ICT uses contribute to their economic progress, social growth, and access to the digital economy in which information a competitive challenge for firms and economies. This economy is concretized in a high digital environment and a strong infrastructure, in which knowledge plays a key role in economy. Algeria has made considerable efforts and initiatives to improve its digital environment and provide access to ICTs.

This research paper aims to study the reality of the digital environment in Algeria and its integration into these technologies knowledge and information domain. It makes some concluding remarks about the current status of ICT in Algeria and the research needed to determine the contribution that ICT will make in this country.

Key words: digital environment, Internet and mobile, ICT, digital gap, digital economy.

JEL Classification Codes: D83, O33, P21.

ملخص

تقوم العديد من البلدان في العالم النامي بما فيها البلدان الأقل نمواً باستثمارات كبيرة في مجال تكنولوجيا المعلومات والاتصالات، وهذا على الرغم من محدودية الموارد المالية وضعف دخل هذه الدول،

Auteur correspondant: LAHMAR Abbes, **Email:** abbess.lahmar@univ-mosta.dz

واستخدامات تكنولوجيا المعلومات والاتصالات تساهم في التقدم الاقتصادي والنمو الاجتماعي، بالإضافة إلى الاندماج في الاقتصاد الرقمي، حيث أن المعلومات أصبحت تشكل تحديات تنافسية للمؤسسات والاقتصاديات، ويتم تجسيد هذا الاقتصاد في بيئة رقمية عالية وبنية تحتية قوية، حيث تلعب المعرفة دورًا رئيسيًا في الاقتصاد، وقد بذلت الجزائر جهوداً ومبادرات كبيرة لتحسين بيئتها الرقمية وتوفير الوصول إلى تكنولوجيا المعلومات والاتصالات.

تهدف هذه الورقة البحثية إلى دراسة واقع البيئة الرقمية في الجزائر ومقومات اندماجها في اقتصاد المعرفة والمعلومات، مع تقديم بعض الملاحظات حول الوضعية الحالية لتكنولوجيا المعلومات والاتصالات في الجزائر والبحث عن المتطلبات اللازمة لتحديد المساهمة التي تقدمها هذه التكنولوجيا في هذا البلد.

كلمات مفتاحية: البيئة الرقمية، الانترنت والهاتف النقال، تكنولوجيا المعلومات والاتصالات، الفجوة الرقمية، الاقتصاد الرقمي.

1. INTRODUCTION

Information and communication technology has brought about major changes in the global economic climate which gives to developed countries significant potential to achieve capital accumulation. In the second half of the 1990s, the United States achieved strong economic growth with low inflation and increased labor productivity; this prompted economists to announce the birth of a new economy linked to advances in information and communication technology. These changes led the United States to a real economic miracle, ten years of steady growth. To keep abreast of these developments, Algeria has given a great space to the telecommunications sector, and announced a plan for reform, restructuring and modernization of the sector since 2000.

Algeria has provided the necessary ground to allow ICT to grow and develop, it has core resources that encourage sector development, and push it to adopt a clear strategy to provide support structures so that there will be a stronger integration into the new economy. Algeria's reforms have played a major role in securing competition, diversifying the economy and

improving services within the framework of a comprehensive concept for the development of the national economy and the policy of economic openness. These reforms did not exclude any area from mobile phone, Landline, Internet and satellite communications; this is part of the efforts made by the country to expand the investment in the infrastructure of the ICT sector.

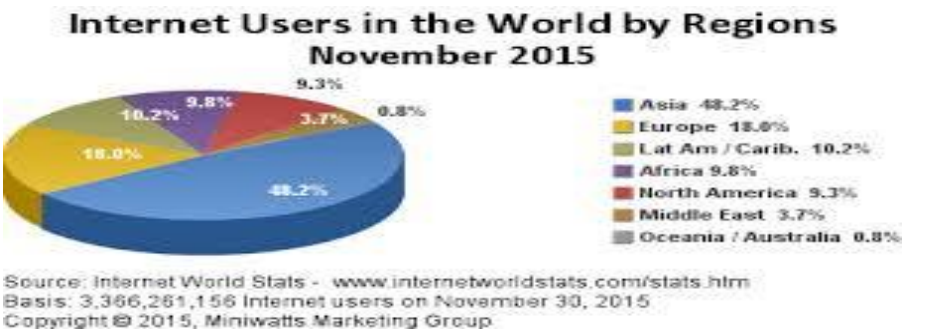
Despite the intervention of the Algerian government in the reforms of the telecommunications sector, and the development of information and communication technology through the increasing proportion of Internet users. ICT in Algeria has not played its role in moving the economy forward.

1- The reality of ICT in Algeria.

According to the International Telecommunication Union (ITU), the number of fixed and mobile subscriptions worldwide increased at a high rate during 2000-2010.The participants in developed countries reached 114.2 per 100 in habitants and 70.1 per 100 in developing countries. The International Federation estimates that the number of mobile phone subscriptions will be roughly equal to the world population.

As for the Internet, recent years have witnessed a significant increase in the number of users, for example in 2010, the number of Internet users reached 110.9 million in Africa and 63.2 million in the Middle East. These ratios have changed in 2015 (Figure 01), Africa recorded a growth rate of 9.8% and Asia 48.2%.

Figure 1. Internet users in the world.



Source: www.Internetworldstats.com/stats.htm November 30.2015.

Between 2012 and 2014, the number of Internet subscribers in developing countries was approximately 31 per 100 inhabitants, which is weak compared to the global average. Developed countries registered 77 participants per 100 inhabitants. In Algeria, the telecommunications sector has developed and is directly open to the private sector through reforms. The Ministry of Supervision, which has become the Ministry of Information and Communication Technology, has also been renamed as an initial step to restructuring the sector. (HUSSEIN, 2005, p. 60).

2-1- Reform of the telecommunications sector in Algeria.

The first results of the reform of the telecommunications sector in Algeria were the agreement of mobile operator (the case of foreign companies: Djezzy and Ooredoo). This adoption was one of the main axes of government programs which revolve around the policy of economic openness, trade liberalization, Euro-Mediterranean partnership agreements and the World Trade Organization. In light of the reforms carried out by Algeria, which have reached the level of postal services, two institutions have emerged:

- "Algeria Telecom" and its branches Mobilis operator;
- And Djawab Internet services;
- "Algeria Post" is a public institution with an industrial and commercial advantage.

The results of reforms in the telecommunications sector emerged in 2001.Several companies' had compete to gain a market part as Orascom Telecom Egypt, Telefonica of Spain, Orange Telecom of France, Portugal Telecom for a mobile license, the Egyptian company Orascom received the offer at $ 737 million, after obtaining the agreement, the company launched its new network Djezzy GSM in the field of mobile phones. The Kuwaiti company obtained a license to operate a mobile phone network on December 02nd, 2003 through the offer of the winner, which was estimated at 421 million dollars, this project is being jointly funded by Gulf Investment Corporation and United Gulf Bank. (FAYçALE, 2005, p. 66), Wataniya Telecom launched its brand Nadjma with attractive services and features on August 25th, 2004. By new standards in the telecommunications

industry, these transformations have helped Algeria to develop the telecommunications sector and generate revenue of $ 380.86 million for telecommunications and 902.94 $ million for mobile operators in 2004. (GHASSAN, 2005, p. 15)

The main activity of Algeria Telecom was adopted on March, 01st2001by the National Council for State Contributions within the development and improvement of public and private networks, to facilitate access to communications and to increase the supply of telephone services in different regions. This regulation allows the promotion of communications as an essential engine of the economy. The aim of these reforms is to improve services and encourage the telecommunications sector as a key sector in the face of competition. (BENELKADI, 2003, p. 05), market openness and liberalization, in general.

The main objectives of the reforms were:

- Increase and diversify the supply of postal and telecommunication services;
- Improve the quality of services offered, competitive pricing and development of postal and telecommunication networks;
- Offer Financial services for post, promotion of national savings and expansion of the range of services;
- Promote communication as a key economic sector for growth in a competitive economy.

The main activities targeted within the Government program are to:

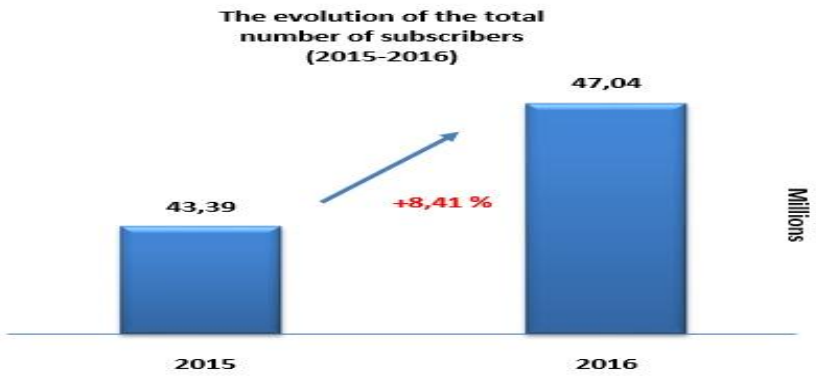
- Reformulate the legal and regulatory framework;
- Create distinct operators for postal and telecommunications services;
- Promote private sector participation, investment and development of Internet services.

2-2- Mobile and Internet in Algeria.

Since restrictions on the telecom market have been lifted, mobile and fixed-line services in Algeria have developed considerably. The mobile phone operator is a successful model in Algeria, where statistics show that the number of subscribers exceeded 32 million in 2012. (HENNI, 2006),

while the number of subscribers did not exceed 9 million during the middle of the year of 2005.The mobile sector in Algeria has introduced the entry of 3G mobile services. So, the number of subscribers in the third generation according to the statistics of the Control Authority in December 2014 rose to 8 million and 231 thousand subscribers, and that the total subscriber density (GSM + 3G) was 115.1% for a population of 39.5 million. The total mobile phone holder reached about 3.65 million subscribers in 2016, an increase of 8.41% compared to the previous year. The total number of subscribers reached 47 million active subscribers (**Figure 2**); 20,362 million subscribers to the GSM network or 43.28%, 25,215 million in the 3G network or 53,60%, and 1,465 million in the fourth generation network(percentage of 3.11%), evolution of the total sum of active subscribers (in million) distributed across each trader are represented as follows: Algeria Mobile Telecommunications 17.34 million, Optimum Telecom Algeria 16.37 million and Wataniya Telecom Algeria 13.33 million subscribers.

Figure 2. Development of the total holder for mobile subscribers in Algeria**.**



Source: R A T, Mobile Market Observatory, Algiers, 2016, p 03.

In recent years, telecom companies have been able to hold direct and indirect business positions; the competition in telecommunications services has contributed to the increase in the number of mobile subscribers with strong competition among the three dealers. The mobile market has achieved an important qualitative leap after entering 3G mobile services (the marketing process began on the 15th of the same month).

Table 1. Mobile Telephone Density.

Population density (million)	39،500
Telephone Density	94،3%
Telephone Density (3rd generation 3G)	20،8%
Total telephone density (mobile + 3G generation)	%115،1

Source: Regulatory Authority for Telecommunications(R A T), 2014

Mobilis is the third largest 3G subscribers with 3,639 million followed by Ooredoo 3,607 million, and Djezzy 985,000 subscribers. It is noted from the previous table that the total subscription density (GSM + 3G) reached 115.1%, these statistics remain preliminary pending the audit of the interests of the control authority, in terms of market share. Djezzy is the market leader in GSM with 47.9%, Mobilis 29%, followed by Ooredoo at 23.1%.The third generation, Mobilis leads the standings by 44.2%, Ooredoo 43.8% and Djezzy which began marketing this service on July 5, 2014 with 12% of the market share. (ARPT, December, 2004). If the mobile phone has been a big success in Algeria, the fixed line is still suffering from delays. The sector remained the monopoly of one public trader where it achieved about 9.1% of the users at the end of 2007, during the same year the fixed market share was 11% compared to 89% market share of mobile phone in 2010, then awaited 53.471 requests for a fixed line with a total number of 166 commercial agencies and 110 branches and recording 4425 telephone services, 212.040 multi-service kiosks lines. Algeria Telecom had revealed the presence of3.3 million fixed line subscribers at the end of March 2016.

With regard to the Internet since the introduction of Ministerial Decree 98-257 of August 1998 which ended the state monopoly of Internet services, the number of users increased by 3 million in 2006. Before, the number was not more than 150.000 in 2000 compared to the population. The employment rate remains low according to the statistics of the International Telecommunication Union amounted to 12.50% in 2010. Despite the slow start to the service of hosting sites, Algeria has recorded a quantum leap in the level of services.

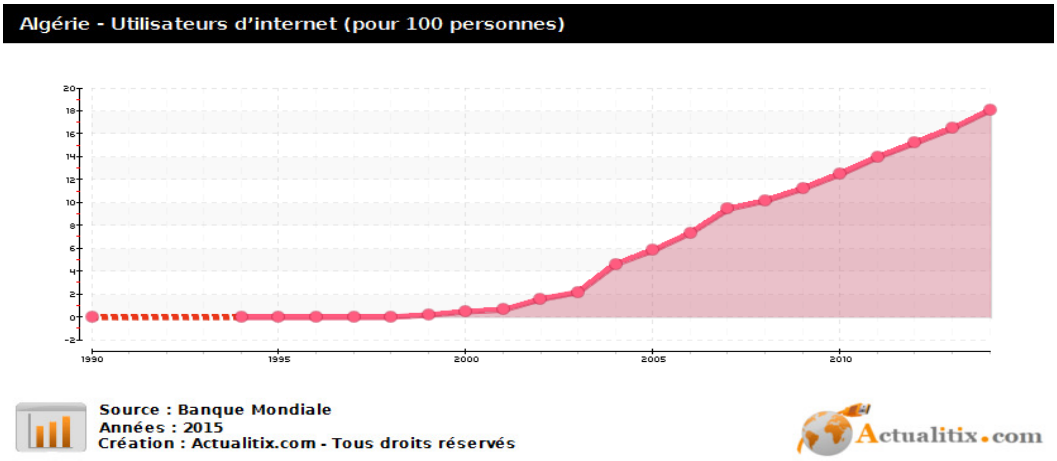
The situation improved slightly as a result of the adopted strategy which began from the decision to:

- Reduce prices;
- Expand the activity of regional administrations;
- launch the high-speed Internet ADSL. (ARPT, 2014).

Algeria Telecom chose several foreign partners to develop Internet services including the German group that employed the latest technologies adopted in Europe to strengthen the capabilities of the Algerian network which is still suffering from short ages. Algeria Telecom has also worked to remedy the significant delays in telecommunications infrastructure, provided a national fiber optic backbone and allowed the connection between the north and south of the country to meet the services of the Internet and banks and institutions. The backbone consists of the following parts:

- The northern backbone has a capacity of 2,5Gbit/S which is operational since September 2002;
- Northern backbone with a capacity of 10Gbit /S, which has been operational since June 2004;
- The southern backbone has a capacity of 2,5Gbit /S, which has been operational since March 2005.

Figure 3. Internet usage in Algeria per 100 persons.

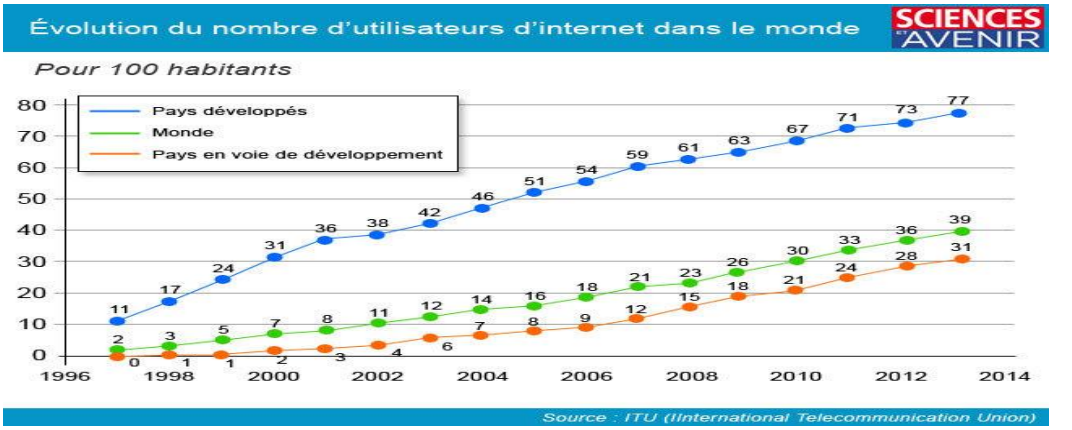


Source: The World Bank, 2015.

In fact, Algeria's reforms and structural adjustments of the technological development have weakly led its economy, as in developed countries, both through their weak contribution to the generation of ICTs or

poor degree of use in a way that contributes to economic growth. As information, the number of Internet subscribers in developed countries between 2012 and 2014 was about 77 subscribers per 100 inhabitants while in developing countries it was 31 per 100 in habitants as the figure 04 shows.

Figure 4. Evolution of the number of Internet users in the World.



Source: statistics International Telecommunication Union (ITU), 2015.

The World Information Technology Report 2015 revealed the failure of the developing countries' economies including Maghreb countries. To invest in ICT, Algeria registered 1920000 users in 2007and moved the number to reach more than 7 million and 700 thousand users in 2011. The Internet in Algeria has been very dynamic after this year, the number of users (18.09 per 100 people) in 2014compared to the ratio in 2008 (12 users per 100 people). The period 2013/2014 marked the emergence of 3G services which contributed to the increase in the number of users; the Ministry of Posts and Communication Technology recorded 8.213.000 subscribers according to the statistics of November 2014with an increase in the number of ADSL subscribers and fixed wireless broadband services, the number of subscribers doubled and reached more than 9 million and 816 thousand subscribers by the end of 2014.The density of Internet in Algeria during the year 2016 was 71.71% and the total number of participants increased to 29.538.700which did not exceed 18.581.032 subscribers in 2015.

Table 2. Evolution of the total number of Internet subscribers in Algeria.

	2015	*2016*	*Development*
ADSL subscribers	1838492	2083114	***31،13%***
Fourth generation 4G LTE subscribers	423280	775792	***28،83%***
3G mobile subscribers	16319027	25214732	***51،54%***
4G mobile subscribers	/	1464811	/
Wimax subscribers (Telecom Algeria)	233	251	***73،7%***
Total Internet Subscribers	18581032	29538700	***09،51%***

Source: Regulatory Authority for Telecommunications, (2016), The internet market in Algeria, P 04.

Large gaps still exist in high-speed internet as private sector investment declines compared to what was lived up to be; there are only 250 million subscribers from developing countries in high-speed Internet although there are many promising World Bank projects and initiatives for these countries, as example we find the Incubators Network programs for Development to assist small and medium enterprises of more than 80 countries and WBI courses to make policies. However, these projects are not carried out on a large scale with the models not fully mature.

3- ICT Development Index in Algeria.

In 2015, the ITU report on the ICT Development Index showed that the Republic of Korea was ranked first. It was one of the top ten economies in the rankings, from Europe (Denmark, Iceland, Sweden, United Kingdom, Luxembourg, Switzerland, Netherlands, and Norway) along with another economy from Asia (Hong Kong, China).All of these economies are characterized by higher incomes reflecting the strong correlation between the high levels of performance in the index and the rise in gross national income per capital. (ITU, 2015), The report also showed that Tunisia ranked first in the Maghreb, ninth in the Arab world and 93 in the world **(Table 03)**.

Table 3. Reality of the Maghreb countries in the ICT Development Index.

Country	*Maghreb countries ranking*	*World ranking*
Tunisia	9	93
Morocco	10	99
Algeria	12	113
Mauritania	16	150

Source: ITU statistics, 2015.

There have been modest successes in terms of using the Internet and improving ICT infrastructure between 2010 and 2015, Morocco ranked 99th in the world and the second in the Maghreb followed by Algeria in third place in the Maghreb and 113 in the world. Despite the improvements in some ICT indicators in the Maghreb countries, their applications remained limited in certain areas such as e-mail services and websites unlike developed countries that use the network in other areas.

3-1- ICT constraints and requirements for improvement

The development of ICT in Algeria was not an effective booster of the national economy. In fact, the Algerian economy has continued to grow by exhausting its large natural resources without technical development being a determining factor in the development strategy. Indeed, Algeria has lagged far behind in digital areas. Despite all the efforts of e-Algeria project, the impact of the ICT sector on economic development is very limited and restricted, for this cause that's why it is not enough to build a digital economy.

The Regulatory Authority for Posts and Telecommunications has revealed its annual report for 2014, that ICTs contribute only 2.9% to national GDP. This ratio is very low compared to the global average of 7% . (OCDE, 2015, p. 22), In Morocco, there are three fixed-line operators, a competitive market for four million individuals and companies, and ICT contributes to 7% to GDP. In Tunisia, the ratio is more than 13%.The main obstacles that negatively affect the digital readiness in Algeria and the degree of their advancement are in discussion to think about finding suitable solutions to activate the digital environment and develop the national economy.

3-2- Constraints to ICT development in Algeria.

From 2012 to 2016 Algeria invested $ 5 billion dollars in the ICT domain without creating an economic boost in this strategic sector. But the entry into the digital economy requires an appropriate environment through which information and knowledge will be disseminated, produced and used efficiently in all fields. It also requires identifying constraints and difficulties related to ICT integration and their interaction with economic

services. In general, there are several factors that led to the delay of Algeria in activating this sector, including some of the following points:

- Existence of a structural backwardness of the Algerian economy and its dependence on oil revenues;
- Lack of confidence in online transactions and payment, and non-widespread use of electronic signature;
- Weak communication infrastructure with unstable telephone services;
- Lack of legal rules governing electronic transactions that are compatible with the requirements of the digital revolution;
- Lack digital gap, weak information and communication capabilities;
- Lack of availability of information on the Internet and low number of users of the network.

The weak role of the government and the contradictory choices sometimes produced an economic situation that made a feeble economy of Algeria that contributes to the weakening of its integration competency in the digital economy. This economy has become a rentier economy based mainly on oil wealth. Many experts have emphasized that there are significant challenges for financial and banking bodies in the use of ICTs in electronic payment and e-commerce; as these services are newly established in Algeria among which are the following:

- Algerian reluctance to use electronic payment cards;
- Lack of confidence in this type of transaction;
- Lack of communication and awareness of the importance of electronic transactions;
- Lack of electronic payment methods;
- Weak incentives and intellectual property protection laws;
- Weak security, evidence and special credit cards.

According to figures provided by the Federation of Financial and Accounting Frames, only 13.85% of the population in Algeria has a fixed line, which does not help to establish the rules of the information society. Algeria's position is far weaker than its material potential; this backwardness appears in the field of innovation, development research, infrastructure, legal framework and in the area of economic stimulus.

Reforms in the telecommunications sector have not met the expected objectives; Algeria lagged far behind other countries that have managed to turn the sector from a mere stock of opportunities into a major arm of the development strategy. It was therefore incumbent on Algeria to embark on new measures to continue the path of reforms.

4- Factors of Algeria's integration in ICTs.

Algeria has shown great interest in the ICT sector and has developed a strategy for the transition to e-government and set up a dedicated ministry for the development of the digital economy. The improvement of the digital environment has positively a reflect on the national economy and create new jobs as well as provide a great opportunity for enterprises to double the volume of sales and promotion of their products.

The widespread use of internet is the foundations of digital transactions where there is a continuous interaction, integration and coordination between information technologies on the one hand and economic activity on the other. The increase of 10% in high-speed Internet connections can bring growth to the country between 15% and 25%. (WORLD.BANK, 2011, p. 17), This changes the patterns of economic performance in business, commerce and investment from the traditional to the immediate stage (speed in performance).

A positive transformation in fields related to the digital economy requires the concentration on the axis related to communication technology with an improvement access to the internet. Its development and bridging the knowledge gap between men and women in addition to the dissemination of electronic culture and the improvement of legislative frameworks and laws that fit digital transactions. The following points reflect the list of key pillars of national digital strategies and include:

- Development of telecommunication infrastructure (access to broadband services and telecommunications);
- Promotion of the information technology sector, including internationalization;
- Activating e-government services;
- Trust in(digital identities, privacy and security);

- Encouraging the adoption of information and communication technologies in small and medium enterprises;
- Dissemination of e-culture with a focus on disadvantaged groups;
- Developing specialized skills in information and communication technology.

The e-Algeria project is a strategy that falls within the definition and implementation of a vision for the future and a practical approach to making the digital economy affect economic growth. The strategy aims to enhance the performance of the national economy and seeks to improve the capacity of education, research and innovation and the establishment of industrial constellations in the field of information and communications technology.

Algeria had to launch new measures to continue reforms while the state has shown great interest in the telecommunications sector and developed a coherent and strong work plan by supporting activities related to ICTs. However, the infrastructure in Algeria continues to suffer from some of the shortcomings that stand in the way of integration into the digital economy.

5- Conclusion:

We have tried through this paper to investigate the reality of ICT in Algeria. This technology has imposed a new ideology through real economic performance. In fact, Algeria, despite the efforts have to lay the foundations of the information society and improve the ICT infrastructure and the basic components of the digital economy, it still suffers from the problem of digital gap due to several factors which made a slow economic growth and ineffective implementation of ICTs. Indeed, Algeria is among the countries with intermediate results, and ICT has not played its role in moving the economy a head.

Algeria is in need of the challenges awareness it faces in the field of scientific and technological knowledge. It must adopt policies that consolidate the values of economic and social responsibility, supporting activities related to information technology. Thus, ICT should play its role in the cohesion with the economy alleviating poverty and deprivation and

ensuring minimum social justice as a socio-economic route to improving access to ICTs and linking them to the objectives of economic and social development. Along these lines, this technology generates change and provides the environment that enables it to occur. Success is therefore primarily linked to the development of an integrated plan for the formulation of objectives and future choices which are central to the activation of integration into the digital economy.

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Investigating the Relationship between Trade Liberalization and Foreign Direct Investment: Evidence from Algeria.

Mohamed KADRI [1], Mohamed DAOUDI [2]

[1] Ph.D student at Tlemcen University, (kadrimohamed70@yahoo.com).

[2] Professor at University Center of Maghnia, (daoudim@ymail.com)

Received: 15/09/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Abstract

This paper explores the causal relationship among trade liberalization, foreign direct investment, financial liberalization and economic growth for Algeria over the period 1995–2017. The Autoregressive Distributed Lag (ARDL) bounds test is used to test for the presence of co-integration, whereas the Toda and Yamamoto test is used for direction of causality.

The findings of ARDL bounds test validate the existence of co-integration among the included variables. Further, the Toda and Yamamoto test affirms that there is bidirectional causality between trade liberalization and foreign direct investment. Additionally, there is a unidirectional causality running from financial liberalization to foreign direct investment as well as unidirectional causality running from economic growth to foreign direct investment.

Keywords: Foreign direct investment; Trade liberalzation; Toda-Yamamoto test; Algeria.

JEL classification codes: C32, F12, F21, F41.

ملخص

تكشف هذه الورقة البحثية العلاقة السببية بين التحرير التجاري، الاستثمار الأجنبي المباشر، التحرير المالي والنمو الاقتصادي في الجزائر خلال الفترة 1995-2017، باستخدام اختبار الحدود- الانحدار الذاتي للفجوات الزمنية الموزعة المتباطئة (ARDL) لاختبار وجود التكامل المتزامن، كما تم استخدام اختبار Toda-Yamamoto لكشف اتجاه العلاقة السببية طويلة الأجل.

Corresponding author: Mohamed KADRI, **e-mail**: kadrimohamed70@yahoo.com.

كشفت نتائج اختبار الحدود–ARDL وجود علاقة تكامل متزامن بين المتغيرات المشمولة، وعلاوة على ذلك أكدت نتائج اختبار العلاقة السببية لـ Toda و Yamamoto وجود علاقة سببية ثنائية الاتجاه بين التحرير التجاري والاستثمار الأجنبي المباشر، إضافة إلى وجود علاقة سببية أحادية الاتجاه تسير من التحرير المالي و النمو الاقتصادي نحو الاستثمار الأجنبي المباشر.

كلمات مفتاحية: الاستثمار الأجنبي المباشر، التحرير التجاري، اختبار السببية لـ Toda وYamamto، الجزائر.

1. INTRODUCTION

Over the last few decades foreign direct investment has become an important source of external finance worldwide (Maliela & Quattara, 2017). Many countries actively seek to attract foreign direct investment because they believe that multinational enterprises will contribute to economic growth by creating new job opportunities, increasing capital accumulation, new technology, acquisition and diffusion of technical, managerial and organizational skills (Despordes & Wei, 2017). Indeed, a large body of empirical evidence shows that FDI tends to generate net gains for both home and host countries. The growth-enhancing effects of FDI flows have motivated a thorough investigation of their determinants. Robust push and pull factors are market size, financial development, exchange rate, relative labour market endowments, and corporate tax rates (Bayrak, 2013; Blonigen & Piger, 2014; Yang, Xiong, & Ze, 2013). Trade liberalization should certainly be added to this list (Ramasamy & Yeung, 2010).

Global trade liberalization has made it easier for multinational enterprises to set up international production networks, so that a larger share of production is shipped to international customers or Subsidiary companies in other countries rather than sold to local customers. This has reduced the effect of market size and allowed smaller countries to compete for investments that would automatically have been directed to the major markets some decades ago (Vukanović, 2016). Empirical studies have evidenced that foreign direct investment and trade liberalization are

interlinked. This nexus has become more complex in World Trade Organization regime where various developing economies have adopted the import liberalization policies. The growing volumes of the trades of economies in their regime made the policy makers concentrate flicked based on the assumption that whether foreign direct investment causes trade or trade boosts foreign direct investment inwards. especially concern was that what kind of trade boosts foreign direct investment (Khan & Hye, 2014).

The core objective of this paper is to analyze empirically the causal relationship between trade liberalization, financial liberalization, economic growth and foreign direct investment. This paper is different from other works in two folds. Firstly, this paper employs a multivariate framework in contrast to most prior studies on Algeria that use bivariate or at most trivariate frameworks. Using a multivariate framework will avoid biased and inconsistent results caused by the omission of relevant variables. Secondly, this study uses data over the period 1995-2017 in order to verify the long run relationship among the incorporated set of variables. In the process of achieving the objectives, long-run relationship among the variables is tested using ARDL bounds test and causality is tested using Toda and Yamamoto causality test.

The remainder structure arrangement is as follows. Section 2, deals with relevant literature review. Section 3, shows the empirical methodology and data used in this paper. Section 4, explains empirical results. Section 4, concludes the study.

2. Literature review

Many studies have explored the connection between trade liberalization and foreign direct investment in recent years. This is particularly due to the important role that trade liberalization plays in foreign direct investment. In relation to the effect of trade liberalization on foreign direct investment, proponents for trade liberalization (Helleiner, 2002; Candros, Orts, & Alguacil, 2004; Liargovas & Skandalis, 2012; Zakaria, Naqui, Fida, & Hussain, 2014; Seyoun, Wu, & Lin, 2013) contend that trade liberalization enhances competition which in turn increases efficiencies, technical change, and product improvement, reduced costs of

production, generate economic growth via increasing profits which encourage growth of foreign capital investment and inflows of expertise, and enhanced equal access to scarce resources which improves the overall resource allocation and eliminates corruption in the system.

(Candros, Orts, & Alguacil, 2004) used quarterly data for Mexico, Brazil, and Argentina, in which they employed a VAR model to investigate the causal relationship among trade, foreign direct investment inflows and production. Their empirical investigation resulted mixed outputs. They found trade openness and foreign direct investment to be complements in Mexico, with causality running from foreign direct investment to trade. Contrary to this finding, their study found that trade and foreign direct investment exhibited substitutive relationship in Brazil, whereas in Argentina they found no causal relationship.

(Liargovas & Skandalis, 2012), examine the importance of trade liberalization policy for attracting Foreign Direct Investment inflows, using a sample of 36 developing economies for the period 1990–2008. It provides a direct test of causality between foreign direct investment inflows, trade openness and other key variables in developing regions of the world as Latin America, Asia, Africa, Commonwealth of Independent States and Eastern Europe. Trade liberalization policy is measured by using eight different indicators. The main empirical results of the panel regression analysis indicate that in the long run, trade liberalization contributes positively to the inflow of foreign direct investment in developing economies.

(Zakaria, Naqui, Fida, & Hussain, 2014) examine the impact of trade liberalization on foreign di-rect investment (FDI) in Pakistan using quarterly data from 1972 to 2010. The findings suggest that there is a significant positive relation between trade liberalization and FDI. The results are robust under alternative trade liberalization measures and different model specifications. The results indicate that the factors that drive foreign investment have a differential impact on FDI flows to Pakistan. Specifically, human and physical capitals, capital re-turn, infrastructure development, terms of trade and urbanization promote FDI in Pakistan.

Foreign debt and inflation lead to deteriorating foreign investment in the country. Another important finding is that the effect of trade liberalization on FDI has been augmented after the inception of a flexible exchange rate system in Pakistan.

By using annual balanced panel data for 25 sub-Saharan African economies over the period 1977-2009. (Seyoun, Wu, & Lin, 2013) investigate the Granger causality relationship between trade openness and foreign direct investment for the region. We took advantage of recent developments in econometric testing techniques for Granger non-causality heterogeneous panels that takes into consideration the impacts of cross section dependence across the units of the panel data set to analyse the trade–foreign direct investment nexus in the region. The empirical result of this study reveals a bidirectional causal relationship between trade openness and foreign direct investment in sub-Saharan economies.

For the period 1970-2009. (Ghani, 2015) identify the major determinant of the inward flows of FDI for Malaysia by employing the bounds testing (ARDL) approach to cointegration. Of all the variables being tested, trade openness is found to be the most influential variable in attracting the inflows of FDI as it shows consistent results in the short run as well as in the long run in all models being tested.

(Grangnon, 2017) uses a panel data set comprising 171 countries spanning the period 1995–2012 to investigate multilateral trade liberalization affect inward foreign direct investment. The results indicate that multilateral trade policy liberalisation is conducive to higher FDI inflows in host countries. Furthermore, our evidence suggests that domestic trade policy almost always positively drives inward FDI in a context of multilateral trade policy liberalisation. Countries which initially have the most restrictive trade policy regimes appear to be the greatest beneficiaries of FDI inflows when they liberalise their trade policy in the context of multilateral trade liberalisation.

In Sub-Saharan Africa, (Cantah, 2018) develop a new measure of trade liberalization to re-examine the relationship between foreign direct investment and trade policy liberalization using principal component analysis. This new measure captures the ease of trading activities and trade

tariffs. Dynamic panel estimation technique was used to analyze the nexus between trade policy liberalization and foreign direct investment in Sub-Saharan Africa countries. The findings indicate that an open economy attracts foreign direct investment.

3. Data and methodology

The study employs annual time series data from 1995 to 2017. The data of foreign direct investment (FDI). Trade liberalization index (TRL). Financial Liberalization index (FNL). Gross domestic product (GDP) per capita to proxy economic growth. The data of foreign direct investment and gross domestic product were retrieved from the World Development indicators of World Bank database. Trade liberalization and financial liberalization from economic freedom index.

3.1. Stationary test:

The first step in causality analysis is to check unit root problem in the data. Therefore we used Augmented Dickey Fuller (ADF) test to investigate the order of integration of all the variables. If a series has constant mean and variance at level form it is represented as I (0) and we call it stationary series. A non-stationary series has changing mean and variance which can be made stationary by taking first difference or second difference of the series denoted as I (1) and I (2). Gujarati and Brooks used the following functional form for ADF test:

$$\Delta Z_t = \beta_1 + \beta_{2t} + \delta Z_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Z_{t-1} + \varepsilon_t \ldots\ldots\ldots (1)$$

$$\Delta Z_t = \beta_1 + \delta Z_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Z_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots (2)$$

$$\Delta Z_t = \delta Z_{t-1} + \sum_{i=1}^{n} \alpha_i \Delta Z_{t-1} + \varepsilon_t \ldots\ldots\ldots\ldots\ldots\ldots (3)$$

Where Δ = the change operator, Z_t = variables series (to be checked for the problem of unit root), Z_{t-1} = lagged values, ΔZ_{t-1} = (Z_{t-1} - Z_{t-2}), ΔZ_{t-2} = (Z_{t-2} - Z_{t-3}) shows the first difference etc, β_1 = constant, $\beta_2 t$ = trend, t represents time variable and εt indicates white noise error term. The decision rule was that if ADF test statistic value was higher than the critical values at 5% significance level then we call it stationary series but if the test statistic value was lower than the critical values then we call it non stationary series (Gujarati, 2011; Brooks, 2008).

3.2. Co-integration test:

This study employed ARDL bounds testing approach of co integration which was developed by Pesaran and Shin (Pesaran, Shin, & Smith, 2001) to investigate the causality between trade liberalization and foreign direct investment for Algeria. An advantage of the ARDL co-integration approach over other cointegration methods is that it can be used regardless of whether the regressors are I(1) and/or I(0). So, it can be applied irrespective of whether underlying regressors are purely I(0), purely I(1), or mutually co-integrated, and thus, there is no need for unit root pre-testing. Another advantage is that it is a statistically more significant approach to determine the co-integration relation in small samples. In addition, the ARDL approach tolerates different optimal lags the variables may have, while it is impossible with classical co-integration procedures (Ocal & Aslan, 2013).

A final advantage is the ARDL approach provides unbiased long-run estimates even when some of the variables are endogenous (Adom, 2011). The first step in the ARDL approach is to specify the Unrestricted Error Correction Model (UECM) as follows:

$$\Delta FDI_t = a_{10} + \beta_{10}t + \sum_{i=}^{n} \beta_{11}\,\Delta FDI_{t-i} + \sum_{i=}^{n} \beta_{12}\,\Delta TRL_{t-i} + \sum_{i=}^{n} \beta_{13}\,\Delta FD_{t-i} + \sum_{i=}^{n} \beta_{14}\,\Delta GDP_{t-i} + \delta_{11}FDI_{t-1} + \delta_{12}TRL_{t-1} + \delta_{13}FD_{t-1} + \delta_{14}GDP_{t-1} + ECT_{t-1} + \varepsilon_{t1} \ldots\ldots (4)$$

$$\Delta TRL_t = a_{20} + b_{20} + \sum_{i=}^{n} \beta_{21}\,\Delta TRL_{t-i} + \sum_{i=}^{n} \beta_{22}\,\Delta FDI_{t-i} + \sum_{i=}^{n} \beta_{23}\,\Delta FD_{t-i} + \sum_{i=}^{n} \beta_{24}\,\Delta GDP_{t-i} + \delta_{21}TRL_{t-1} + \delta_{22}FDI_{t-1} + \delta_{23}FD_{t-1} + \delta_{24}GDP_{t-1} + ECT_{t-1} + \varepsilon_{t2} \ldots\ldots (5)$$

$$\Delta FD_t = a_{30} + b_{30} + \sum_{i=}^{n} \beta_{31}\,\Delta FD_{t-i} + \sum_{i=}^{n} \beta_{32}\,\Delta TRL_{t-i} + \sum_{i=}^{n} \beta_{33}\,\Delta FDI_{t-i} + \sum_{i=}^{n} \beta_{34}\,\Delta GDP_{t-i} + \delta_{31}FD_{t-1} + \delta_{32}TRL_{t-1} + \delta_{33}FDI_{t-1} + \delta_{34}GDP_{t-1} + ECT_{t-1} + \varepsilon_{t3} \ldots\ldots (6)$$

$$\Delta GDP_t = a_{40} + b_{40} + \sum_{i=}^{n} \beta_{41}\,\Delta GDP_{t-i} + \sum_{i=}^{n} \beta_{42}\,\Delta TRL_{t-i} + \sum_{i=}^{n} \beta_{43}\,\Delta FD_{t-i} + \sum_{i=}^{n} \beta_{44}\,\Delta FDI_{t-i} + \delta_{41}GDP_{t-1} + \delta_{42}TRL_{t-1} + \delta_{43}FD_{t-1} + \delta_{44}FDI_{t-1} + ECT_{t-1} + \varepsilon_{t4} \ldots\ldots (7).$$

Where Δ represents the First differenced operators, $a_{10}, \ldots\ldots a_{40}$ are the constant terms, $b_{10}t, \ldots\ldots b_{40}t$ are the trend terms, $\beta_{11} \ldots\ldots \beta_{44}$ represents the short-run coefficients, $\delta_{11} \ldots\ldots \delta_{44}$ represents the long-run coefficients

and $\varepsilon_{t1} \ldots\ldots \varepsilon_{t4}$ are the error terms. After specifying the UECM, the nest step is to test for joint significance on the lagged variables in Eqs. (4), (5), (6), (7) using the F-test. The null hypothesis of no co-integration is specified as:

$$H_0: \delta_{11} = \delta_{12} = \delta_{13} = \delta_{14} = 0, \delta_{21} = \delta_{22} = \delta_{23} = \delta_{24} = 0, \delta_{31} = \delta_{32} = \delta_{33} = \delta_{34} = 0, \delta_{41} = \delta_{42} = \delta_{43} = \delta_{44} = 0.$$

Once the F-test has been computed it should be compared to the critical values. This study employs the critical values proposed by Narayan which is specifically generated for small sample size (Narayane, 2005). If the computed F-statistic falls below the lower bound critical value, the null hypothesis is not rejected and it can be concluded that there is no cointegration. If the F-statistic exceeds the upper bound, the null hypothesis is rejected, implying that there is cointegration among the variables. However, if F-statistic falls in between lower and upper bound, there is indecision.

3-3- Causality test:

For causality test, we applied Toda and Yamamoto tests which are available whether the series is I(0), I(1), or I(2), non co-integrated, or co-integrated of any arbitrary order (Toda & Yamamoto, 1995). The key aspect of the Toda & Yamamoto approach is to augment the standard VAR model by the maximum order of integration $(k + d_{max})$. The first step in this approach is to determine the maximum order of integration (d_{max}) for the set of variables. The second step is to specify the VAR model. The VAR models are specified as:

$$\mathrm{FDI_t} = \mathrm{A_1} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \theta_{1\mathrm{i}}\, \mathrm{FDI_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \theta_{2\mathrm{j}}\, \mathrm{FDI_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \gamma_{1\mathrm{i}}\, \mathrm{TRL_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \gamma_{2\mathrm{j}}\, \mathrm{TRL_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \pi_{1\mathrm{i}}\, \mathrm{FD_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \pi_{2\mathrm{j}}\, \mathrm{FD_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \varphi_{1\mathrm{i}}\, \mathrm{GDP_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \varphi_{2\mathrm{j}}\, \mathrm{GDP_{t-j}} + \mu_{1\mathrm{t}} \ldots\ldots \quad (8)$$

$$\mathrm{TRL_t} = \mathrm{A_2} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \epsilon_{1\mathrm{i}}\, \mathrm{FDI_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \epsilon_{2\mathrm{j}}\, \mathrm{FDI_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \vartheta_{1\mathrm{i}}\, \mathrm{TRL_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \vartheta_{2\mathrm{j}}\, \mathrm{TRL_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \rho_{1\mathrm{i}}\, \mathrm{FD_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \rho_{2\mathrm{j}}\, \mathrm{FD_{t-j}} + \sum_{\mathrm{i=1}}^{\mathrm{k}} \tau_{1\mathrm{i}}\, \mathrm{GDP_{t-i}} + \sum_{\mathrm{j=k+1}}^{\mathrm{dmax}} \tau_{2\mathrm{j}}\, \mathrm{GDP_{t-j}} + \mu_{2\mathrm{t}} \ldots\ldots \quad (9)$$

$$FD_t = A_3 + \sum_{i=1}^{k} \omega_{1i} FDI_{t-i} + \sum_{j=k+1}^{dmax} \omega_{2j} FDI_{t-j} + \sum_{i=1}^{k} \aleph_{1i} TRL_{t-i} + \sum_{j=k+1}^{dmax} \aleph_{2j} TRL_{t-j} + \sum_{i=1}^{k} \beth_{1i} FD_{t-i} + \sum_{j=k+1}^{dmax} \beth_{2j} FD_{t-j} + \sum_{i=1}^{k} \sigma_{1i} GDP_{t-i} + \sum_{j=k+1}^{dmax} \sigma_{2j} GDP_{t-j} + \mu_{3t} \ldots\ldots (10)$$

$$GDP_t = A_4 + \sum_{i=1}^{k} \emptyset_{1i} FDI_{t-i} + \sum_{j=k+1}^{dmax} \emptyset_{2j} FDI_{t-j} + \sum_{i=1}^{k} \ni_{1i} TRL_{t-i} + \sum_{j=k+1}^{dmax} \ni_{2j} TRL_{t-j} + \sum_{i=1}^{k} \alpha_{1i} FD_{t-i} + \sum_{j=k+1}^{dmax} \alpha_{2j} FD_{t-j} + \sum_{i=1}^{k} \beta_{1i} GDP_{t-i} + \sum_{j=k+1}^{dmax} \beta_{2j} GDP_{t-j} + \mu_{4t} \ldots\ldots (11)$$

Where k is the optimal lag length of the VAR and d_{max} is the maximum order of integration of the variables. The third step is to decide on to decide on the optimal number of lags to use in the VAR model. The optimal number is chosen after reviewing AIC criterion. The fourth step is to conduct the Granger test on Equations (8), (9), (10), (11).Following, the hypothesis should be specified. For the four equations the null hypothesis is specified as:

$H_{08}: \gamma_{1i} = \pi_{1i} = \varphi_{1i} = 0$ (No causality relationship)

$H_{09}: \epsilon_{1i} = \rho_{1i} = \tau_{1i} = 0$ (No causality relationship)

$H_{010}: \omega_{1i} = \aleph_{1i} = \sigma_{1i} = 0$ (No causality relationship)

$H_{011}: \emptyset_{1i} = \ni_{1i} = \alpha_{1i} = 0$ (No causality relationship)

The decision on whether to accept or reject the null hypothesis should be based on the modified WALD test. If p value is < 0.05, the null hypothesis of no causality should be rejected and vice-versa if p value is > 0.05.

3-4- Diagnostic and stability tests :

One of the most important and crucial assumptions in the ARDL Bounds Testing methodology is that the errors must be serially independent. Therefore, Breusch-Godfrey Serial Correlation LM test will be used for testing Serial Independence. The heteroscedasticity will also be checked using ARCH test. In addition the Jarque-Bera test for testing normality of errors.

It is obligatory to ensure the dynamic stability of any model having autoregressive structure. The stability of the model will be checked by using the cumulative sum of recursive residuals (CUSUM) and cumulative

sum of recursive residuals of squares (CUSUMSQ) tests as suggested by Pesaran and Pesaran (1997) (Rahman & Kashem, 2017).

4. Results and discussion

4.1. Stationary test:

The time series properties of the various variables in the model are investigated by employing the Augmented Dickey-Fuller (ADF). The ADF stationary test results are displayed in the following table (Table 1):

Table 1. Results of augmented Dickey-Fuller test (ADF).

Variables	Level			1st difference			Decision
	Constant & Trend	Constant	Without	Constant & Trend	Constant	Without	
FDI	-3.102	-3.179**	-1.109	-5.447*	-5.039*	-5.184*	I(0)
TRL	-2.574	-1.995	0.048	-4.342**	-5.851*	-5.970*	I(1)
FNL	-1.562	-1.320	-1.330	-4.565*	-4.584*	-4.463*	I(1)
GDP	-0.248	-1.623	3.605	-2.963	-2.687	-2.015**	I(1)

Notes: FDI: Foreign direct investment, TRL: Trade liberalization, FNL: Financial liberalization, Y: GDP per capita, *, **: denotes statistical significance at 1% and 5% respectively.

Source: Based on outputs eviews10.

It can be inferred from the above estimates that under ADF test variables of TRL, FNL, GDP are non-stationary at levels, but attains stationarity after taking first difference and hence of order I(1). While FDI is stationary at level I(0). This mix and uncertain order of integration of the variable justifies using the ARDL approach of cointegration, and toda-yamamo to for causality test.

4.2. Co-integration test:

Table 2. ARDL bound test results.

Model	F-stat	Optimal lag	I(0)-I(1) Bounds test at (%)			Decision
			1%	5%	10%	
Fdi/trl,fnl,y	5.630	(1,0,3,2)	4.3-5.23	3.38-4.23	2.97-3.74	Cointegration
Trl/fdi,fnl,y	6.801	(2,3,3,3)	4.3-5.23	3.38-4.23	2.97-3.74	Cointegration
Fnl/trl,fdi,y	6.573	(2,2,1,1)	4.3-5.23	3.38-4.23	2.97-3.74	Cointegration
y/trl,fnl,fdi	2.634	(3,3,3,3)	4.3-5.23	3.38-4.23	2.97-3.74	No. Cointegration

Notes: Critical values are for the model with trend but no constant as provided by Narayan (2005). I(0)= Lower bound critical values. I(1)= Upper bound critical values.

Source: Based on outputs eviews10.

After proving that all the variables are stationary at either I(0) or I(1) and none of the variables are I(2), the next step is to test the existence of co-integration among the variables. Table (2) reveals the results of ARDL bounds test for co-integration. The F-statistic for equation (4) (5.630) exceeds the upper bound critical values at 1%,5% and 10% significant levels. Similarly, the F-statistic for equations (5) and (6) (6.801), (6.573) exceeds the upper bound critical values at all significant levels. The null hypothesis is rejected and we conclude that there is co-integration.

lternatively, the F-statistic for equation (7) (2.634), is below the lower bound critical values at 1%, 5% and 10% significant levels. Accordingly, the null hypothesis of no co-integration is not rejected and we conclude that there is no co-integration.

Table 3. Estimated Long-run coefficients using the ARDL (1, 0, 3, 2) approach, dependent variable is FDI.

Independent variables	**Coefficients**	**Std-Error**	**T-Ratio**	**P-Value**
Trend	-0.597	0.201	-2.961	0.015**
TRL	0.046	0.015	2.972	0.015**
FNL	0.218	0.088	2.475	0.035**
GDP	0.010	0.003	2.611	0.028**

**indicate significance at 5%.

Source: Based on outputs eviews10.

The long-run coefficients of the variables are estimated (sse table 3). There is positive relationship between trade liberalization and foreign direct investment, and the coefficient is 0.046 with statistical significance at 5% meaning that a unit in trade liberalization will result in a 0.046 increase in foreign direct investment in the long-run. Financial liberalization has a positive and statistically significant on foreign direct investment at 5%. A coefficient of 0.218 implies that a unit increase in trade liberalization will led to 0.218 increase in foreign direct investment in the long-run. In the same vein economic growth (market size) has a positive and statistically significant on foreign direct investment at 5%. A coefficient of 0.010 implies that a unit increase in economic growth will led to 0.010 increase in foreign direct investment in the long-run.

Table 4. Error correction representation for the selected ARDL model, dependent variable is ΔFDI.

Independent variable	Coefficients	Std-Error	T-Ratio	P-Value
C	-53.868	19.676	-2.737	0.022**
Trend	-0.732	0.243	-3.008	0.014**
Δ(FNL)	0.042	0.025	1.692	0.124
Δ(GDP)	0.000	0.001	0.178	0.862
ECT(t-1)	-0.915	0.192	-6.376	0.000*

*,**indicate significance at 1% and 5% respectively.

Source: Based on output eviews10.

After establishing that the variables are cointegrated, the unrestricted error correction model (UECM) is estimated within the framework of the ARDL to derive the short-run coefficient of the relationships among the variables. The findings are presented in table 4. The coefficients of financial liberalization and economic growth are insignificant and therefore, there is no short-run relationship between variables and foreign direct investment.

The lagged Error Correction Term (ECT_{t-1}) is of the right negative sign and is statistically significant which means that an equilibrium relationship could be restored any time there are deviations. The coefficient of ECT_{t-1} is (-0.915) implies that approximately 91.5% of the shocks to the model are restored in the next period.

4.3. Causality test:

Table 5. Toda &Yamamoto test results.

Equations	H_0	Chi-sq	Df	P-value	Decision
8	TRL/FDI	6377.56	3	0.00	Reject H_0
	FNL/FDI	4207.05	3	0.00	Reject H_0
	GDP/FDI	8045.71	3	0.00	Reject H_0
9	FDI/TRL	20.43	3	0.00	Reject H_0
	FNL/TRL	5.57	3	0.13	Don't reject H_0
	GDP/TRL	9.55	3	0.02	Reject H_0
10	FDI/FNL	6.97	3	0.07	Don't reject H_0
	TRL/FNL	6.70	3	0.08	Don't reject H_0
	GDP/FNL	3.82	3	0.28	Don't reject H_0
11	FDI/GDP	2.18	3	0.53	Don't reject H_0
	TRL/GDP	0.46	3	0.92	Don't reject H_0
	FNL/GDP	0.79	3	0.85	Don't reject H_0

Source : Based on output eviews10.

After determining the existence of co-integration in three equations, the possibility of causality is plausible. Therefore, causality is tested using Toda and Yamamoto test. Based on the unit root results specifically ADF test, variable TRL (Trade Liberalization), FNL (Financial Liberalization) and Y (GDP) are stationary after first difference I(1). Alternatively, FDI (Foreign Direct Investment) is stationary at level I(0). Hence, the maximum order of integration d_{max} is I(1). Subsequently, the optimal lag length (k) chosen after reviewing AIC and SC is 3. Having determined the maximum order of integration d_{max} and optimal lag length k, the VAR order now becomes (3+1). The chosen VAR order is used to estimate the VAR equations (8), (9), (10), (11). The findings of Toda and Yamamoto test are reported in table 3. Based on the results, p-value is less than 0.05 in equation (8). Hence, evidence of causality exists either from trade liberalization, financial liberalization and economic growth to foreign direct investment. There is evidence of causality running from foreign direct investment and economic growth to trade liberalization in equation (9). Alternatively, the p- value is greater than 0.05 in both equations (10) and (11). Hence, no evidence of causality exists between variables.

4.6. Diagnostic and stability tests:

Table 6. Diagnostic test results.

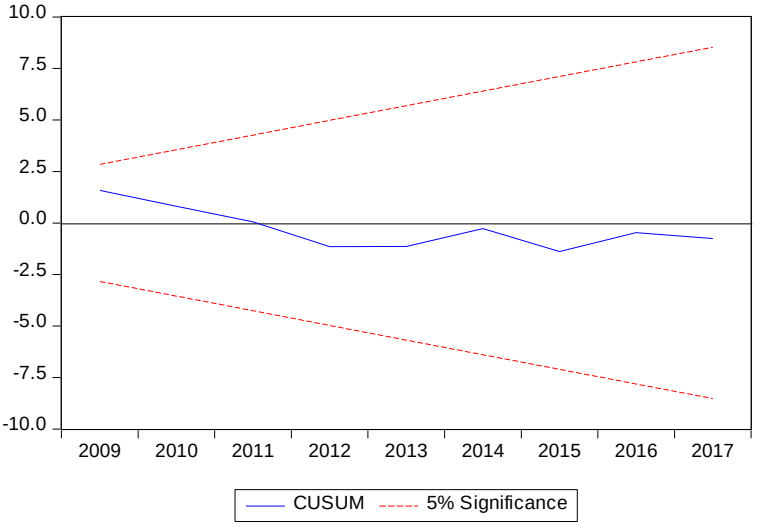
	Tests	P-Value
Dependent variable is FDI	Serial Correlation(Breusch-Godfrey)	0.259
	Hetroscedasticity(ARCH)	0.583
	Normal Distribution(Jarque-Bera)	0.538

Source: Based on output eviews10.

Based on the Breusch-Godfrey test, the p-value is more than 0.05, therefore the null hypothesis of no serial correlation is not rejected. The ARCH test result indicates that the model is free of heteroscedasticity. The Jarque-Bera normality test concludes that the residuals of the model have a normal distribution.

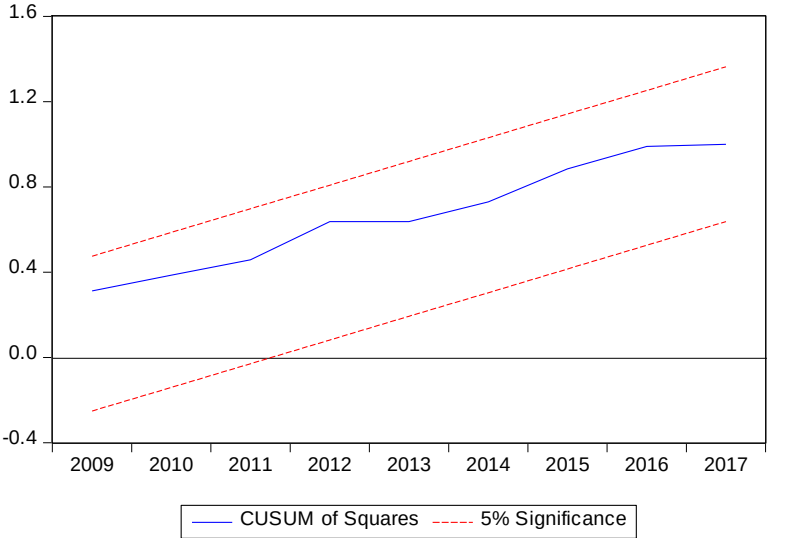
To ensure the robustness of our results we employ structural stability tests on the parameters of the long-run results based on (CUSUM) and (CUSUMSQ) tests as suggested by Pesaran (1997). A graphical representation of CUSUM and CUSUMSQ statistics are provided in figures, 1and 2 below. If the plots of the CUSUM and CUSUMSQ remain within the 5 per cent critical bound, it would signify the parameter constancy and the model stability. Both the plots indicate that almost none of the straight lines (drawn at the 5% level) are crossed by CUSUM and CUSUMSQ i.e., the plots of both the CUSUM and CUSUMSQ are within the boundaries (shown by the dotted red lines). Therefore these findings confirm the model stability and that there is no systematic change identified in the coefficients at 5% significance level. It is concluded that the coefficients of the parameters are stable over the sample period (1995-2017).

Fig.1. CUSUM test.



Source: Based on output eviews10.

Fig. 2. CUSUM of squares test:



Source: Based on output eviews10.

5. Conclusion

This study examines empirically the causal relationship between trade liberalization, financial development, economic growth and foreign direct investment for Algerian for the period 1995-2017. The Autoregressive Distributed Lag bounds test is used to test for the presence of co-integration, whereas the Toda and Yamamoto test is used for direction of causality. The

findings of ARDL bounds test validate the existence of co-integration among the included variables. Further, the Toda and Yamamoto test affirms that there is bidirectional causality between trade liberalization and foreign direct investment. Additionally, there is a unidirectional causality running from financial liberalization to foreign direct investment as well as unidirectional causality running from economic growth to foreign direct investment.

The empirical results indicate that trade policy liberalization has positive impact on the foreign direct investment. However, these inflows remain weak in Algeria. The implication of this result is that, for Algeria to attract FDI, the policy framework on liberalization should be geared toward a more liberalized economy in terms of policy. Thus Algeria should rather make efforts to reduce the number of days it takes to undertake an international trading activity, the cost of undertaking an international trading activity, the number of documentations as well as the tariff. If this is done, the economy would be able to attract more inflows into the country. This creates an enabling environment for global interaction which benefits the source of foreign direct investment into the country.

Also to have more benefits of foreign direct investment through trade liberalization, the certainty and credibility of liberalization policy need to be improved that may be through the removal of corruption level, removal of monopolies of big loanees from the private financial sector, and political stability. By providing the good investment environment, not only the foreign direct investment may be attracted but it may also be oriented to other industries.

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Size Estimation of the Informal Economy in Algeria During the Period of 1990-2017
(Using Gutmann's Simple Currency Ratio Approach)

Redha DAHMANI [1], Mourad ZAID [2]

[1]University of Algiers 03, Algeria, (redhadahmani@outlook.com)
[2] University of Algiers 03, Algeria, (zaidmourad895@gmail.com)

Received: 15/09/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Abstract

The main purpose of this study is to evaluate the size of informal economy in Algeria using the simple currency ratio method of Gutmann, Thus we started this research paper with analyzing the ratio of currency in circulation to the demand deposits in Algeria during the period 1990-2017.

The empirical results pointed out that the ratio of informal economy to official economy reached around the value of 25% to 30 % during the period of 1990-2003 and follows a decreasing trend during the period 2001-2007, And the general graph trend From 2008 to 2016 seemed increasing to about 25% of the official GDP by the end of 2016.

Keywords: informal economy, Gutmann's method; currency; demand deposits; official GDP.

JEL classification codes: E26, E41, C13, H2.

الملخص

تهدف الورقة البحثية إلى تحديد حجم الاقتصاد غير الرسمي في الجزائر باستخدام منهج نسبة النقود السائلة لغوتمان، وهو الأمر الذي تطلب من الباحثين إجراء تحليل لسلسلة البيانات المتعلقة بنسبة النقود السائلة المتداولة إلى حجم الودائع تحت الطلب في الجزائر خلال الفترة 1990-2017.

وأوضحت نتائج الدراسة أن حجم الاقتصاد غير الرسمي كنسبة من الاقتصاد الرسمي كان في حدود 25 % إلى 30 % خلال الفترة 1990-2003 لينخفض بوتيرة منتظمة خلال الفترة 2001- 2007 ،

Corresponding author: Redha DAHMANI, **e-mail**: redhadahmani@outlook.com

أما عن الفترة التي تلت سنة 2008 فقد عرف الاقتصاد غير الرسمي خلالها ارتفاعا ملحوظا جاوز عتبة 25 % من الاقتصاد الرسمي مع نهاية سنة 2016.

كلمات مفتاحية: الاقتصاد غير الرسمي، طريقة غوتمان، السيولة، الودائع تحت الطلب، الناتج المحلي الإجمالي الرسمي.

1. INTRODUCTION

The multiplicity of research about the informal economy since the seventies of the last century contributed to create an academic balance on various aspects related to the informal economy, starting with the labels that launched the phenomenon through the reasons contributing to the growing phenomenon among the economies of the world at different levels of progress to the most difficult element, Assessing the size of informal economic activities.

1.1 The empirical evidences

Many studies indicate that the use of cash in the transactions´ settlement falls within the informal economy activities, in which agents try to keep them hidden from the official records, because it is difficult to trace. As a result, a rise in the currency demand may represent a rise in the informal economy, thus the currency ratio is one of the indicators that may be relied upon much in the estimation of the informal economy size.

Adriana A.DAVIDESCU (**Estimating the size of Romanian shadow economy using Gutmann's simple currency ratio approach,2013**) estimated the size of subterranean economy in Romania using the simple currency ratio method of Gutmann for quarterly data covering the period 2000-2010. The results reveal that the ratio of shadow economy to official economy decreased from 21% to about 12% of official GNP during the period 2000-2006. At the end of 2006, the size of subterranean economy decreased until the third quarter of 2008 (year which supposed that the subterranean economy does not exist). In the last years, the size of shadow economy as

ratio of official GNP begin to increase slowly, reaching the value of 9.29% in the second quarter of 2010.

Adriana. D, Vasile .A, Andreea M. Paul (**Revisiting The Size of Romanian Informal Economy Using The Gutmann Approach,2015**) the paper was estimate the size of informal economy in Romania using Gutmann approach for quarterly data covering the period 2000-2014. Thus, the study analyzed the ratio of currency to overnight deposits in order to estimate the amount of illegal transactions in informal sector .The empirical results pointed out that the ratio of underground economy to official economy reaches the value of 19% at the beginning of 2000 and follows a decreasing trend during the period 2000-2008. From the end of 2008, it begins to increase gradually reaching to about 13% of official GDP in first quarter of 2014. The researchers add in the latest article that the informal economy is characterized by the difficulty of discovery and any empirical results should always be regarded as an approximation and also should be interpreted with due reserve, given the limitations of the method.

Fethi ÖĞÜNÇ, **Gökhan YILMAZ** (**ESTIMATING THE UNDERGROUND ECONOMY IN TURKEY,2000**) The researchers attempted to highlight the size of the informal economy by comparing the size of the latter through a several estimation approaches in Turkey, the method was applied for the period between 1960-1998. Data was examined for two different time periods, 1960-1979 and 1980-1998, due to the structural economic changes occurred after 1980. For the period 1960-1979, The average size of the informal economy was about 9.5 percent during the first period and 16.2 percent during second period With a significant increase between the two periods of study.

1.2 Objectives and potential contribution of this research

Through this research paper we will try to stand on the size of the informal economy in Algeria during the period of 1990-2017 in order to tend the grasp of the interaction and effects of the informal economy activities. In order to do so, We applied a rather simple calculation method which is a ***simple currency ratio method (SCR).***

1.3 The research problem

The main question which comes first is***: If the size of the informal economy depends on the use of cash in the transactions, how can monetary approaches contribute to determining the size of the informal economy in Algeria****?*

1.4 Description of the research design

About the structure of this research paper is organized as follows: The article begins with the theoretical considerations concerning definition of informal economy and a brief discussion of its main related activities. This is followed by a concise description of the various measurement methods of informal economy size. The field part provides a brief description of the simple currency ratio method and summarizes the data and methodology and presents the results of the Algerian informal economy estimation during the period of 1990-2017. Finally, the last section offers a summary to the main results and some concluding remarks.

2. Generalities about informal economy

It is commonly known that the first to use the term "informal economy" was **J. Keith Hart** in Ghana when he conducted a study on urban unemployment in Africa in the second half of 1970 at the Institute for Development Studies -Sussex University- It was revised and published in 1973 in the Journal of Modern Studies, prior to the 1972 (International Labour Office) report, known as the Kenya Report, when it conducted a study on Development in Developing Countries.

It is thus clear that the first to be revised and used by the International Bureau of Labour (BTI), in its report on the term "informal sector" in the early 1970s, described the economic reality that prevailed in many low-income countries. The term was later changed to "informal economy" to emphasize that it describes a different phenomenon from the general economy. The informal economy as a concept goes beyond the "informal sector" which includes a variety of workers and economic entities of various sectors in the urban and rural contexts.

2.1 The concept of the informal economy

The phenomenon of informal economy is defined under various names in the literature, indicating various aspects of it such as: underground economy, informal economy, unobserved economy, shadow economy, second economy, parallel economy, hidden economy, illegal economy, unrecorded economy, marginal economy, unreported economy, unofficial economy, dual economy etc. This variation makes it difficult to develop a common definition. In academic studies the term "underground economy" is considered as the most comprehensive definition, as it includes the illegality (Erdinç, 2016, p. 5).

- J. Keith Hart The informal sector is one way of carrying out activities characterized by: A) a facility of entry, B) the use of indigenous resources, C) the family ownership of businesses, D) small scale operations, E) flexible, labor-intensive technology, F) Knowledge developed away from the formal school system, G) Free and competitive markets(Noiseux, 2000, p. 16).

-Schneider and Enste the informal sector comprises activities, which are not part of national income accounting. These include, apart from regular activities such as helping neighbors, irregular and criminal activities. The shadow economy is defined by irregular activities (e.g. illicit labor), and the underground economy is defined by criminal activities (Joras Ferwerda, 2010, p. 2).

Through previous studies, the informal economy is divided into legal and illegal activities. In addition, **Gourévitch** proposes, for example, to distinguish three main forms of informal economy: black, gray and pink, each of these forms refers to various types of activities(Sylvain & Fendt, 2010, p. 6).

2.2 Activities related to the informal economy

Through the above, the term "informal economy" has been chosen by many international institutions, which has a broader impact than the "informal sector", we can distinguish activities related to the informal economy by legitimacy-criteria basis of these activities, which are classified as legitimate activities that can be incorporated into the formal economy through the disclosure of tax and regulatory institutions which are called parallel or shadow economy, however the other activities are illegal that

the authorities seek to combat.

The following table shows the various activities related to the informal economy including criminal activities, although most of them have not been integrated into the estimation process, with the exception of tax evasion that many economists (as V. Tantzi) consider it to be one of the most important indicators of appreciation.

Table.1 Informal (or Grey) Activities

Tax avoidance (legal)	**Infringement of copyrights**
-fringe benefits -legal tax planning, e.g. trusts	-production of counterfeit goods -Internetfraud
Tax evasion (illegal)	-social securityfraud, etc
-underreporting/non reportingof income. - non-issuance of receipts -illegal tax schemes	Work by illegal immigrants Production, distribution and sale of narcotics
Double jobbing/moonlighting	Corruption
-e.g. civil servants	- e.g. bribes
Home production/services	Illegal arms trading
-baby sitting , cleaning	Money laundering
- home hairdressing , etc	Unauthorised gambling
Pettyunregulated/unreported trading & production Benefits in kind	Trafficking of humans Unauthorised prostitution Extortion
-e.g. use of company facilities for personal gain	Smuggling & Piracy of the seas Theft

Source: GeorgeGeorgiou,Measuringthe Size of theInformalEconomy: A Critical Review, Working paper Series of Central bank of Cyprus, p5, May 2007.

3. Methods of Estimating the Size of the Informal Economy

Although the term "informal economy" appeared in the 1970s, this did not prevent the emergence of an assessment of the size of the informal economy, there have been many attempts to measure the size of the informal economy despite difficulties and problems, especially since these activities are characterized by secrecy and concealment.

There are a number of methods used to measure the size of the informal economy, but in general there are two main trends in the estimation. The first is the direct trend, which is based on the calculation of the output of the sub-economic activities that are related to the informal economy. The second is the indirect trend, which is based on tracking the implications of the existence of informal activities (Echavarria, 2015, p. 10).

3.1 Direct Approaches

These methods rely on surveys, samples based on voluntary replies, tax audits and other compliance methods. The problem is that the results depend directly to the questions asked by the survey, and few surveys are alike. As a result, it is very difficult to use the same parameters to measure and compare the informal economy in different countries. Usually, what ends up happening is that the definition that is used has to be very simple and contain only one parameter. For example, the informal sector may be defined as those people who do not have the right to a pension when they retire (Echavarria, 2015, p. 11).

3.2 Indirect Approaches

These Methode of measurement are based on macroeconomic indicators, which are often linked to the informal economy as a proxy for its size or growth , We mention the following methods :

- **Discrepancy between the National Expenditure and Income Statistics**

This method allocates the difference between income and expenditure, theoretically these two measures should be equal, However, Income from informal activities will increase the expenditure measurement but not in the income measurement. This is because the income side is measured through the value added of registered firms (the formal economy),

- **Discrepancy between Official and Actual Labor Force:**

The labor input approach, which is based on the labor input matrix and assumes a stable relationship between the potential working population (based on age) not incorporated in the informal sector and production by the informal sector (Echavarria, 2015, p. 11).

✐ The Currency Demand Approach

The various monetary approaches that assume stable relationships between transaction activity and monetary variables, moreover activities in the informal economy use cash flow in settling the various transactions so not to leave any traces.

✐ Multiple Indicators, Multiple Causes (MIMIC) Approach

This approach is one of the most used methods of estimating the size of the informal economy, which is widely known among economists and is known as the model of non-measurable variables associated with measurable variables which takes both the causes (input) and indicators (output) associated with the informal economy.

4. Analysis of the reality of the informal economy in Algeria

4.1 Currency ratio method

in this study, we will try to use the method of the cash money ratio to money supply, it is derived from The classic currency demand approach to estimate the size of the informal economy in Algeria and the percentage of the latter's contribution to the gross domestic product through the data related to appendix (01).

In the category of monetary approaches, there are three methods namely simple currency ratio (SCR) method of Gutmann (1977), the transaction method of Feige (1979) and the currency demand method of Tanzi (1983), based on the work of Cagan (1958)(DAVIDESCU, 2013, p. 34).

The ***currency demand approach*** is used for measuring the underground economy and hence tax evasion. This approach was first employed by Cagan (1958) to estimating the size of the underground economy for the Unites States over the period 1919 – 1955. Twenty years later, Gutmann (1977) and then Feige (1979) used the same approach but without any statistical procedures. Cagan's approach was further adopted and developed by Tanzi (1980, 1983) to determine the size of the underground economy for the United States by estimating econometrically a currency demand function for the country over the period 1929-1980.(Ademola & Bekoe,

2011, p. 137).

In 1980 Tanzi (1980) constructed an estimate of the money demand, using the model of Feige (1979), and compared it to the recorded money supply in the US, using yearly data from 1929 to 1980. In his seminal paper, Tanzi (1980) suggests that one of the main factors that deter individuals from legally transacting in the US is that they have to give away part of these transactions in the form of taxes. Tanzi (1983) started to examine the view of Cagan (1958) who had previously argued that, although cash does not pay interest, it is and will be used as a means to avoid paying taxes, focusing thus on tax evasion, Tanzi (1983) builds a model where the ratio of cash to non-cash money supply is generated by the ratio of personal income tax to total adjusted income, the ratio of legal cash remuneration to total personal income, the interest rate, and real income per capita (Joras, Deleanu, & Unger, 2010, p. 6).

Gutman thinks that over time, as a result of the use of checks and credit cards, demand for the currency decreases, and he argued that the ratio of currency to narrow money supply M1, has consistently grown in the US since 1961.

Briefly, this approach presented several ideas, the most important of which rise in currency stocks and payments is likely a good indicator of transactions which are carried out in secret far from the eyes of the government authorities, **DAVIDESCU** added that transactions in currency are anonymous while those involving checks leave an identifiable trace, participants in the underground sector have an incentive to use cash to hide the source of income from tax or authorities. In this sense, a rise in the currency ratio, other things equal, could signify an increase in underground activity (DAVIDESCU, 2013, p. 39).

Following Cagan (1958) and Guttman (1977), the specifications of SCR method can be expressed as below:

$$C = C_U + C_0 \quad (01)$$

$$D = D_U + D_0 \quad (02)$$

$$K_o = C_o / D_o \quad \ldots\ldots (03)$$

$$K_U = C_U / D_U \quad \ldots\ldots (04)$$

$$V_o = \frac{Y_o}{C_o + D_o} \quad \ldots\ldots (05)$$

$$V_U = \frac{Y_U}{C_U + D_U} \quad \ldots\ldots (06)$$

$$\beta = \frac{V_o}{V_U} \quad \ldots\ldots (07)$$

Where:

C - actual currency stock;
D- actual stock of demand deposits;
Y o - observed income;
u -subscript to denote unobserved sector;
o -subscript to denote observed sector;
k o - ratio of currency to demand deposits in observed sector;
k u - ratio of currency to demand deposits in observed sector;
v u - unobserved sector income velocity;
v o - observed sector income velocity.

In spite of the advantages offered by the model in estimating the size of the informal economy it did not escape the criticism that we mention:

- Uncertainty of the use of money alone in settling transactions in the informal economy.
- A rise in currency demand deposits is usually due in large degree to a slowdown in demand deposits and not to a rise in currency due to informal economic activity (Echavarria, 2015, p. 10).
- The impossibility of having a base year in which the informal economy is non-existent
- Assuming equal speed of money circulation in the formal and informal economies, which is totally contrary to reality
- Most of the studies related to the money approach focus on one factor that causes the growing phenomenon of the informal economy, namely, the burden of taxation and the neglect of other influential factors such as the multiplicity of regulations and procedures.

4.2 Estimating the size of informal economy using Gutmann's method: Data Description

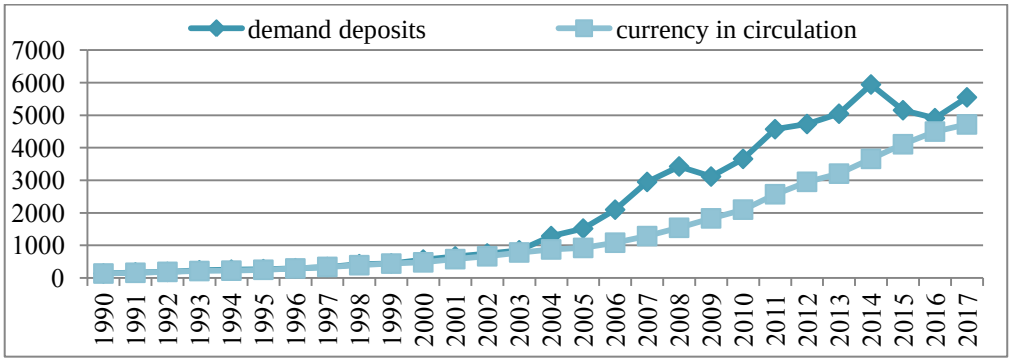
The monetary approach is based on the assumption that cash is used to make transactions that informal economy actors want to keep hidden from official records. Transactions made using cash are difficult to trace, while those made with other assets, registered in financial institutions, can be easily inspected. In order to estimate the size of informal economy using currency ratio method, annual data series covering the period 1990-2017 were used. The study analyzes the currency ratio to demand deposits in order to estimate the size of economic activity in the informal economy in Algeria. The main sources used to collect the data were obtained from:

- National Bureau of Statistics (Algeria), - Central Bank of Algeria.
- IMF (International Financial Statistics) ,- World Bank database.

Empirical results

Gutman sees that the adoption of a base year in which the size of the informal economy does not exist is a crucial subject in this approach; this base year is also related to the minimum value of the ratio of currency in circulation to deposits (C/D). In order to quantify the size of the informal economy as a percentage of GDP (% of GDP), we selected 2007 as the base year to estimate the volume of informal economy. It was adopted as a base year on the grounds that the currency in circulation ratio is the lowest among those in the rest of years. Since the results are fairly sensitive to the choice, different base year selection results various conclusions.

Fig 1. Currency in circulation versus demand deposits in Algeria during the period 1990-2017

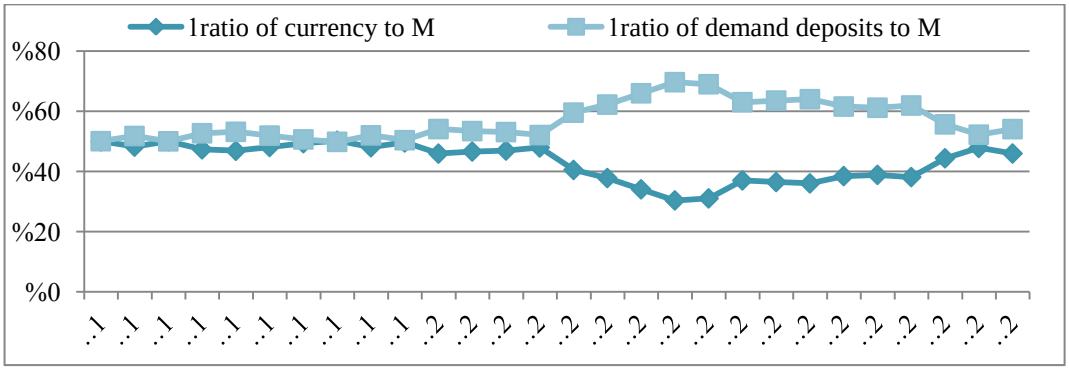


Source: World Bank database & National Bureau of Statistics in Algeria.

Through the representation of the two series (**Fig 1**), we can highlight the presence of a common increasing trend with the mention of the high demand deposits increased more rapidly than the currency.

Both series developed in the same way during 1990-2004, and the currency in circulation series followed the same steps of progressing during all the successive period (2005-2017), however, the demand deposits series witnessed a remarkable increase at the beginning of 2005, achieving record demand rates in 2008 and in 2014(it can be said that the increase in demand for deposits during 2008 is due to the crisis of the recession witnessed by the world, in addition, the collapse of oil prices in 2014).

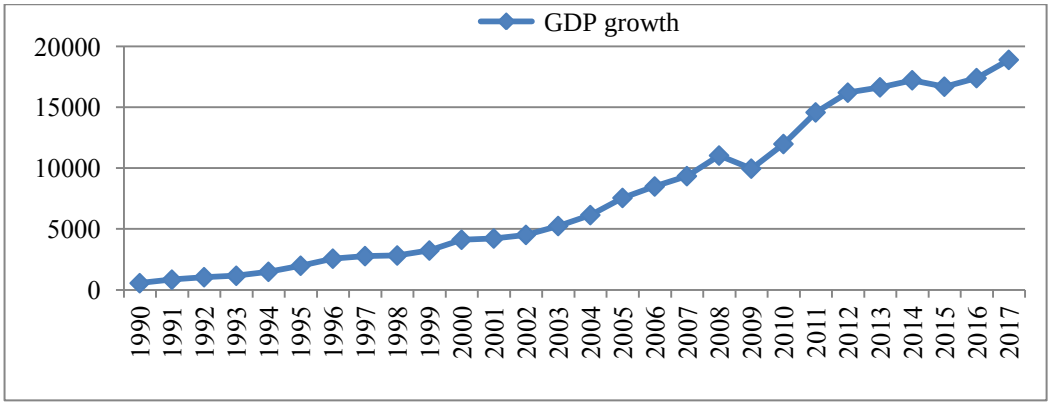
Fig 2. Evolution of currency ratio and demand deposits ratio in Algeria during the period 1990-2017



Source: World Bank database & National Bureau of Statistics in Algeria.

The figure shows that the components of the M1 (includes cash & checking deposits or currency & demand deposits) had the same percentage of the monetary mass from 1990 until 2004 where liquidity rates outside the banking system began to decline to about 30 % of the volume of M1, in return, demand deposits raised and maintained that rise until 2016, when currency becomes around 48 % and the demand deposits becomes around 52 %.

Fig 3. Evolution of GDP



Source: World Bank database & National Bureau of Statistics in Algeria.

GDP is one of the most important macroeconomic indicators that reflect the effectiveness of economic performance because it reflects the sum of gross value added by resident economic agents plus any product taxes minus all aids not included in the value of the products. Through the **Fig 3** GDP increased during the years of study at a constant rate except for the years 2009 and 2015 Which experienced a slight decline due to the global financial crisis in 2008 and the oil crisis in 2014 especially since the Algerian economy is one of the global economies being affected by international variables related to the hydrocarbon market.

The empirical results of informal economy based on (SCR) Simple Currency Ratio are presented in Table 2 & 3.

Table 2. Simplified explanation of calculation

	C	D	K= C/D	I C	L C	V= GDP/M1	IE = IC * V	IE(%) = IE/PGD
2007	1284,5	2949,10	0,44	0,00	1284,50	2,21	0,00	0,00
2017	4716,9	5549,19	0,85	2299,9	2416,99	1,84	4235,6	22,40

Source: own calculation.

C: Currency in circulation , **D**: demand deposits, **M1**:money & quasi money (C+D)

$IC_t = D_t \times (K_t - K_{min}) = 5549.19 \times (0.85\text{-}0.44) = 2299,92$

$LC_t = D_t \times K_{min} = 5549.19 \times (0.44) = 2416,99$

$IE = IC \times V = 2299,92 \times 1,84 = 4235,65$

Table 3. Simple currency ratio approach for the period 1990-2017 (base year = 2007)

(in billions of local currency)

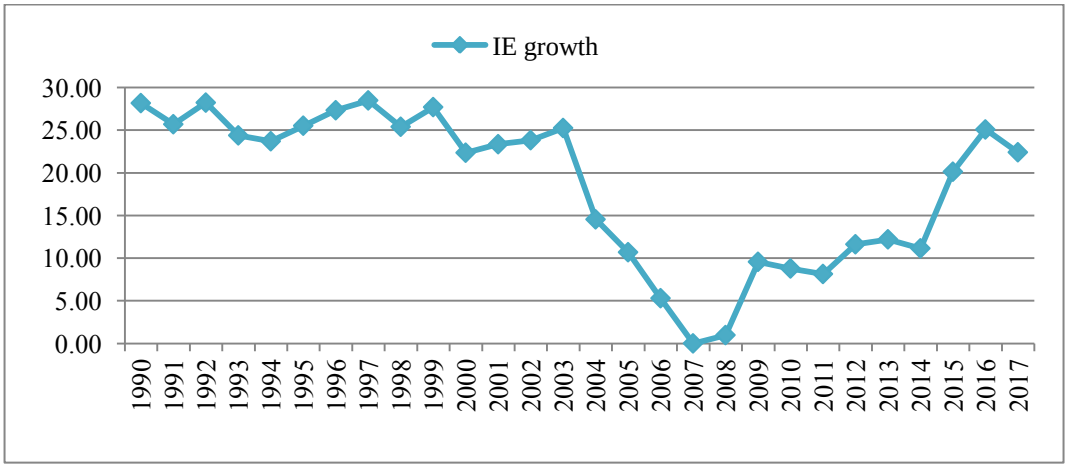
	C	D	K= C/D	GDP	Illegal currency	Legal currency	velocity of money	Informal economy	informal economy (% of
1990	134,94	135,16	1,00	555,80	76,07	58,87	2,06	156,53	28,16
1991	157,20	168,70	0,93	844,50	83,72	73,48	2,59	216,95	25,69
1992	184,85	184,85	1,00	1048,20	104,3	80,51	2,84	295,82	28,22
1993	211,31	235,19	0,90	1166,00	108,8	102,44	2,61	284,31	24,38
1994	222,99	253,01	0,88	1491,50	112,7	110,20	3,13	353,42	23,70
1995	249,77	269,33	0,93	1990,60	132,4	117,31	3,83	507,95	25,52
1996	290,88	298,22	0,98	2570,00	160,9	129,89	4,36	702,33	27,33
1997	337,62	335,18	1,01	2780,20	191,6	145,99	4,13	791,87	28,48
1998	390,80	422,90	0,92	2830,50	206,6	184,20	3,48	718,68	25,39
1999	439,50	446,00	0,99	3238,20	245,2	194,26	3,66	896,83	27,70
2000	478,10	563,30	0,85	4123,51	232,7	245,35	3,96	921,60	22,35
2001	577,20	661,30	0,87	4227,11	289,1	288,03	3,41	986,95	23,35
2002	664,70	751,60	0,88	4522,77	337,3	327,36	3,19	1077,24	23,82
2003	781,40	849,00	0,92	5252,32	411,6	369,79	3,22	1326,01	25,25
2004	874,30	1286,20	0,68	6149,12	314,0	560,21	2,85	893,94	14,54
2005	921,00	1516,50	0,61	7561,98	260,4	660,52	3,10	808,10	10,69

2006	1081,40	2096,40	0,52	8501,64	168,3	913,10	2,68	450,25	5,30
2007	1284,50	2949,10	**0,44**	9352,89	0,00	1284,5	2,21	0,00	0,00
2008	1540,00	3424,90	0,45	11043,70	48,26	1491,7	2,22	107,35	0,97
2009	1829,40	3114,80	0,59	9968,03	472,7	1356,6	2,02	953,07	9,56
2010	2098,60	3657,80	0,57	11991,56	505,4	1593,1	2,08	1052,88	8,78
2011	2571,50	4570,20	0,56	14588,97	580,9	1990,5	2,04	1186,69	8,13
2012	2952,30	4729,20	0,62	16209,60	892,4	2059,8	2,11	1883,29	11,62
2013	3204,00	5045,80	0,63	16647,92	1006,	2197,7	2,02	2030,63	12,20
2014	3658,90	5944,10	0,62	17228,60	1069, 9	2588,9 9	1,79	1919,51	11,14
2015	4108,00	5153,10	0,80	16702,12	1863, 53	2244,4 7	1,80	3360,83	20,12
2016	4497,20	4909,80	0,92	17406,83	2358, 70	2138,5 0	1,85	4364,57	25,07
2017	4716,91	5549,19	0,85	18906,56	2299, 92	2416,9 9	1,84	4235,65	22,40

Source: own calculation.

According to **Table 3** using of simple currency ratio approach, informal economic activities are not stable during the period of study, and we mentioned that the volume of activities related to the informal economy remained constant between 25 and 30 % during the period 1990-2004. During the period 2009-2017, informal economic activities follow an upward path reaching 25 % of official GDP at the end of 2016.

Fig 4. The ratio of informal economy to official economy for the period 1990-2017



Source: own calculation.

As a result, the period of 1990-2003, informal economic activities followed a slow upward trend until the end of 2003, in which the size of informal economy reaches the value of 25.25 % of official GDP, in the beginning of 2004, the amount of illegal activities as % of official GDP began to decrease until the end of 2007 which is the base year in which is supposed no informal economy to exist, the increase of illegal activities as % of official GDP during the period of 2003-2007 was the result of the financial situation improvement of the Algerian economy and the adoption of the development plans policies, by the beginning of the year 2000 and the end of 2003 results of the economic recovery plan began to appear, especially the period of 2001/2004 which contributed to the creation of many permanent and temporary jobs.

And for the last period, the ratio of informal economy to official economy increased slowly during 2008-2014, reaching about 12 % in the end of 2014, while the period 2015-2016 has seen a rapid rise in the ratio of the latter to reach 25 % by the end of 2016.

Note: the informal economy data for the years neighboring 2007 (base year) can't be considered in our analysis, because it was assumed equal to zero in the beginning of our study.

4.3 Causes of the Informal Economy in Algeria

Vito Tanzi pointed to the diversity of factors that contribute to the growth of the phenomenon and its ramifications, and was able to limit them in four main groups which are: **1) taxes, 2) regulations, 3) prohibitions, 4) bribery**, and he gave great importance to the weight of the taxes burden(Vito, March 2002, p. 2), economy of Algeria suffers from a large deficit due to tax evasion and avoid taxes. Empirical studies and theoretical models using data drawn from several countries conclude that in general the key factors that cause the informal economy growth are: taxes and social security contributions (*SSC*), composition of the labor force (e.g. unemployment and self employment rate) and the quality of governance (Roberto & Helen, 2008, p. 2543). Algeria is not very different from the rest of the world in terms of the reasons behind the growth of activities related to the informal economy, among the factors that contribute to it.

About the other causes (Bouanani, 2013/2014, p. 95) explained through her experimental study the main causes were derived through the **MIMIC** model which were as follows:

Unemployment, inflation rate, government expenditures and minimum wages are variables the most affecting the rise of the hidden economic activities size.

Consequently, the raise of inflation rate by 1 % implicates a rise of 0.42 % of the I.E. and the raise of unemployment by 1% implicates the rise of 0.97 % of the IE, a raise of government expenditures by one unit implicates a rise of (1.46E-08%) of the IE and the decrease of minimum wages by one unit implicates an increase of 0.07% of the IE. And basing on statistical tests, she found that inflation rate affect greatly the size of the IE by 0.84 %, while unemployment rate come in the second place by 0.83 %.

5. CONCLUSION

In this paper the researchers used simple currency ratio method (SCR) to take out the size of informality in Algeria from 1990 until 2017, With considering that 2007 represents the base year (the informal economy was assumed equal to zero), so velocity of money was the lowest during the period of 1990-2017.

To sum up, from the results of this paper the informal economy followed a slow upward trend during 1990-2003 where the size of informal economy reaches the percentage of 25.25 % of official GDP, at the end of 2003 the results reveal that the ratio of informal economy to the formal economy decreased until 2007, for which we have supposed that the subterranean economy does not exist**,** In the last years, the size of informal economy as ratio of formal economy begins to increase slowly during 2008-2014, reaching about 12 % by the end of 2014, while the period 2015-2016 has seen a rapid rise in the ratio of the latter to reach 25 % by the end of 2016**.**

Finally we conclude with the following suggesting :

1. To come closer to the informal economy size true value we need to use different measurement methods and to compare the results with

those issued from micro-informal economy research.

2. Monetary methods used in informal economy size measurement are not very reliable in countries with underdeveloped monetary system.
3. Because of the high percentage of informal economy in Algeria, the government should consider some procedures concerning taxation system and make use of electronic government and raise awareness of tax evasion risks on national economy.

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7. Appendices

Appendix 01. Macroeconomic Aggregates

	Currency in circulation C	Demand deposits (D)	M1	M2	GDP
1990	134,94	135,16	270,10	343,00	555,80
1991	157,20	168,70	325,90	416,19	844,50
1992	184,85	184,85	369,70	519,89	1048,20
1993	211,31	235,19	446,50	627,42	1166,00
1994	222,99	253,01	476,00	723,49	1491,50
1995	249,77	269,33	519,10	799,60	1990,60
1996	290,88	298,22	589,10	915,10	2570,00
1997	337,62	335,18	672,80	1085,49	2780,20
1998	390,80	422,90	813,70	1287,90	2830,50
1999	439,50	446,00	885,50	1463,40	3238,20
2000	478,10	563,30	1041,40	1659,20	4123,51
2001	577,20	661,30	1238,50	2473,50	4227,11
2002	664,70	751,60	1416,30	2901,50	4522,77
2003	781,40	849,00	1630,40	3354,30	5252,32
2004	874,30	1286,20	2160,50	3738,00	6149,12
2005	921,00	1516,50	2437,50	4070,40	7561,98
2006	1081,40	2096,40	3177,80	4827,60	8501,64
2007	1284,50	2949,10	4233,60	5994,60	9352,89
2008	1540,00	3424,90	4964,90	6955,90	11043,70
2009	1829,40	3114,80	4944,20	7173,10	9968,03
2010	2098,60	3657,80	5756,40	8280,70	11991,56
2011	2571,50	4570,20	7141,70	9929,20	14588,97

2012	2952,30	4729,20	7681,50	11015,10	16209,60
2013	3204,00	5045,80	8249,80	11941,50	16647,92
2014	3658,90	5944,10	9603,00	13686,70	17228,60
2015	4108,00	5153,10	9261,10	13704,50	16702,12
2016	4497,20	4909,80	9407,00	13816,30	17406,83
2017	4716,91	5549,19	10266,10	14974,60	18906,56

Source: - C , D National Bureau of Statistics.

- M1 , M2 Central Bank of Algeria.
- GDP World Bank database.

The Effect of External Oil price Shocks on the Algerian Economy in the Light of Trade Openness Simulation Using the Computable General Equilibrium Model

Nawel SEMOUK [1], Mohammed TOUITOU [2]
[1]University of Algiers 3, (manarunet13@yahoo.com)
[2] University of Algiers 3, (touitoutouitou@yahoo.fr)

Received: 01/09/2018 **Accepted:** 16/01/2019 **Published:** 23/01/2019

Abstract:

This article aims to describe the effect of external oil price shocks on some variables of the Algerian economy such as local production, trade (import, export) by using the computable general equilibrium model.

The basic data of the model is the table of inputs and outputs of Algeria in 2013, which was identified by the social accounting matrix created by using national accounts data.

We have therefore tried to determine how the world price of oil affects the Algerian economy open to the shocks of trade liberalization, where we used a simulation of policy for the trade openness of the economy, which is the increase of 10% and the 30% drop in the price of oil.

The results of the study show that the tax revenues generated by the 10% increase in global oil prices were a reason to rely on the hydrocarbon sector and continued to depend on it instead of encouraging others sectors to be produced, such as the agricultural sector.

On the other hand, the tax revenues generated by the 30% fall in the price of oil led to a fall in the level of production and value-added in most sectors except in some sectors such as agriculture.

Keywords: Trade openness, Algeria, Oil price, Simulation, Computable general equilibrium model.

JEL classification codes: F14, C15.

Corresponding author: Nawel SEMOUK, **Email**: manarunet13@yahoo.com

ملخص:

يهدف هذا المقال إلى وصف تأثير صدمات أسعار البترول الخارجية على بعض المتغيرات في الاقتصاد الجزائري مثل الإنتاج الوطني، التجارة (الاستيراد والتصدير)، باستخدام نموذج التوازن العام القابل للحساب.

البيانات الأساسية للنموذج هي جدول المدخلات والمخرجات للجزائر لسنة 2013، والذي تم تحديده باستخدام مصفوفة المحاسبة الاجتماعية التي تم إنشاؤها باستخدام بيانات المحاسبة الوطنية.

حاولنا تحديد الكيفية التي يؤثر بها السعر العالمي للبترول على الاقتصاد الجزائري المفتوح لصدمات تحرير التجارة، حيث استخدمنا محاكاة لسياسة الانفتاح التجاري للاقتصاد وهي الزيادة بـ 10٪والتخفيض بـ 30 ٪ في سعر البترول.

أظهرت نتائج الدراسة أن الإيرادات الضريبية الناتجة عن زيادة السعر العالمي للبترول بنسبة 10٪ كانت سببا في الاعتماد على قطاع المحروقات والاستمرارية في الارتكاز عليه بدلا من تشجيع القطاعات الأخرى مثل القطاع الزراعي. من ناحية أخرى، أدت الإيرادات الضريبية الناتجة عن التخفيض في السعر العالمي للبترول بنسبة 30٪ إلى انخفاض مستوى الإنتاج والقيمة المضافة في معظم القطاعات باستثناء البعض منها كالقطاع الفلاحي.

كلمات مفتاحية: الانفتاح التجاري، الجزائر، سعر البترول، المحاكاة، نموذج التوازن العام القابل للحساب.

1. INTRODUCTION:

The importance of trade openness for a country was mentioned by David Ricardo in (1817) in his theory of comparative advantages.

The author has shown that international exchange allows a differentiation of the relative costs of production, a reorientation of scarce resources towards the most efficient sectors and an improvement of the well-being of the population.

This theory was extended later by Heckscher and Olin (1933), these authors have confirmed these gains by adding those related to the remuneration of factors of production. (Alain, 1993)

When evaluating the effects of trade openness on an economy, computable general equilibrium models (CGEMs) are often used (lofgren, Harris, Robinson, 2001) because they remain the most appropriate for studying the economy. Impact on an economy of macro economic policies such as trade policies.

In particular, they make it possible to take into account the interactions between the different sectors of an economy, which is particularly useful for analyzing the impacts of trade openness on an economy. They are also more satisfactory than partial equilibrium analyses because they provide an overview of the channels through which policy implementation takes place.

It seems reasonable to expect the liberalization process to have a positive impact on some sectors or actors in the economy and negative for others. Most of the Computable General Equilibrium (CGEM) model used to assess the impacts of trade liberalization policies relies on neoclassical modeling as presented in Dervis and al. (1982), Lofgren and al. (2002) modeled on international food policy. Research Institute (IFPRI), or on the EXTER model of Decaluwe (2001).The Global Trade Analysis Project (GTAP) model is also widely used to analyze the impacts of trade liberalization policies, but still relatively low in the Caribbean and Pacific countries because of its multi-regional structure and the difficulty of having recent and reliable data for the countries of this region.

The growing importance of trade openness has generated considerable controversy among countries, particularly developing countries, as to their impact on economic activity. (Kim S.H, 2014)

This interest has increased in recent decades, coinciding with the emergence of the World Trade Organization which includes almost succeeding in imposing on them conditions which are centered on the inevitability of trade opening in order to adapt its policies with economic evolution in order to improve their economies.

The problem:

Since independence, the transformation of the Algerian economy has been characterized by a special situation resulting from the experience of central economic planning, which has dedicated the principle of "all-state", which has dominated for more than three years decades.

Algeria's development strategy was based on the model of manufacturing industries oriented by investment towards the production of intermediate consumer goods and equipment for the creation of industrial fabric this development strategy yielded important results over the period 1967-1984 with an average growth rate of more than 7%. (Benbitour, 1998)

When this growth did not benefit the national economy until it allowed the transfer of technology to the benefit of the industry, in particular the procedures adopted in the investment, which does not favor the transfer of technology, remains one of the weaknesses of the development of the Algerian economy.

The collapse of oil prices in 1986, combined with the depreciation of the dollar, has disastrously reduced the supply of machinery for the production of raw materials, leading to increased reliance on external debt, which ultimately affected the national economy.

This new situation is forcing the Algerian government to undertake economic reforms to stabilize the national economy with a new disengagement from the state and a move towards greater openness of the economy. With the liberalization of imports and the development of exports as pillars of the new economic development strategy.

Algeria, and like all other developing countries, is starting to feel the danger of globalization and its repercussions, which have led many

countries to economic integration to occupy competitive positions in order not to stay away from it all.

In this regard, it has been shown that a number of theoretical and applied studies determine the role of the policy of trade openness and in terms of the nature of data and methods of analysis, the positive role of openness in economic growth.

It is therefore possible to say that on the basis of the results obtained by some theoretical and applied studies in this respect on the one hand, as well as the openness of the Algerian economy, which is affected by the conditions of the world economy on the other hand and in general.

The principal focus of the study is to show the nature and extent of the incentives oil prices could provide on the way to further boost the economy of Algeria. It also tries to find out what the economic position would be, should the oil prices be decrease or increase.

In the light of study objectives, the major hypothesis will be as following:

- Algeria's economy is mainly supported by oil rents and dependent on the available crude oil deposits, the country has the capacity to sustain GDP growth, government expenditure and development growth. There exists a controversial empirical relationship between oil rents and economic growth in Algeria, and hence the need to initiate policy frameworks to sustain economic sustainability.
- The computable general equilibrium model is appropriate for measuring the effect of external shocks resulting from the application of the open trade policy to the Algerian economy.

To achieve this, it will be necessary to specify:

- Selection of the computable general equilibrium model proposed for the Algerian economy with reference to the social accounting matrix, which will serve the database to solve this model with the choice of the mathematical formula.
- The implementation of the model;
- The simulation of design and description;

- Finally draw the results of the model which done by using the program called General Algebraic Modeling System (GAMS).

To understand all aspects of the subject, we divided the research into two parts, a theoretical approach in which we moved to different theoretical concepts and a descriptive statistical analytical approach that focused on the collection and analysis of practical data used.

2. Literatures review:

Many researchers spent a great deal of their time looking into trade and trade related problems. It was only recently during the 1973 oil embargo by Arab countries that some researchers came to realize the effect of differences in oil exports in the light of activities of oil producing economies. The main aim of this paper is to review the related literatures essential to the theme chosen for this research work to this research.

The analysis of the macroeconomic effects of oil price shocks has received considerable attention in the literature (for recent surveys see Kilian (2008b) and Hamilton (2008)). Most of it focuses on industrialized countries, particularly on the US. This bias is even more noticeable in cross-country studies (Cologni and Manera (2008);Kilian (2008a); Peersman and Van Robays (2012)) with some notable exceptions such as Abeysinghe (2001), Cuñado and Pérez de Gracia (2005) and Cuñado et al. (2015) who have looked at the impacts of oil price shocks in the Asian region.

Some studies focus on the effects of oil prices under the framework of market structures. The effects of oil price increase on output and real wages have been shown by Rotemberg and Woodford (1996) in an imperfectly competitive market scenario. In their study, it has been shown that 1 percent oil price increase contributes to 0.25 percent output and 0.09 percent real wage decline. And these results have been supported by Finn (2000). Finn studies oil price and macroeconomic relationship under perfect competition. According to the author, the adverse effect of oil price increase on economic activity is indifferent to the market structure. Regardless of the

structure of the market, perfect or imperfect, oil price increase negatively affects economic activity.

Guo and Kliesen (2005) used a measure of realized volatility constructed from daily crude oil future prices traded on the Nymex, and find that, over the period 1984-2004, oil price volatility has a significant effect on various key US macroeconomic indicators, such as fixed investment, consumption, employment and the unemployment rate.

Jin (2008), in a comparative analysis, discovered that oil price increases exert a negative effect on economic growth in Japan and China and a positive effect on Russia. Specifically, a 10 per cent permanent increase in international oil prices is associated with a 5.16 per cent growth in Russian gdp and a 1.07 per cent decrease in Japanese gdp.

Elmi and Jahadi (2011) used var approach to analyze the effect of oil price shocks on economic growth fluctuations in selected opec and oecd countries for the period 1970-2008, and found that both opec and oecd countries are affected by oil price shock albeit at different degrees.

Berument et al. (2010) in a study on Middle East and North African countries found the asymmetric effects of world oil price shocks on the gdp of Algeria, Iraq, Jordan, Kuwait, Oman, Qatar, Syria, Tunisia, and UAE to be positive and statistically significant, while positive but insignificant results were reported for Bahrain, Egypt, Lebanon, Morocco and Yemen.

Farzanegan and Markwardt (2009) found a strong positive relationship between oil price changes and industrial output growth and real effective exchange rate for the Iranian economy. However, Lorde et al. (2009) found that unanticipated shock to oil price volatility brings about random swings in the macro economy of Trinidad and Tobago. However, only government revenue and the price level exhibit significant responses, while magnitude of oil price volatility responses tend to yield smaller macroeconomic impacts. Also, Granger-causality tests indicate causality from oil prices to output and oil prices to government revenue. Similarly, Bekhet and Yusop (2009) reveal evidence of a stable longrun relationship and substantial short

run interactions between the oil price and employment, economic growth and growth rate of energy consumption in Malaysia.

Chuku et al. (2011) studied the linear and asymmetric impacts of oil price shocks on the Nigerian economy for the period 1970Q1-2008Q4 using var model and Granger causality test approach; and found that oil price shocks are not a major determinant of macroeconomic activity in Nigeria in the linear model; while Granger causality results indicate that world oil prices do not influence macroeconomic activity and that non linear specification results show that the impact of world oil price shocks on the Nigerian economy are asymmetric.

Lescaroux and Mignon (2008) considered the effect of oil price changes on gdp, cpi, unemployment rate and bond price in opec member countries and some oil importing countries. In two cases, Iran and Saudi Arabia, causality is birectional. For Brazil and Oman causality runs from gdp to oil price. For other cases, oil price change causes gdp change.

Farzanegan and Markwardt (2008) analyzed the impact of oil price shocks on Iran's economy. The study estimated a VAR to analyze the dynamic relationship between oil price shocks and major macroeconomic variables. The study also pointed out the asymmetric effects of oil price shocks. The quarterly data included measures of industrial GDP per capita, government expenditures, inflation, imports, and exchange rate over the period Q2, 1975 to Q4, 2006. The results revealed that positive and negative oil price shocks significantly affect the inflation and the real exchange rate, but have a marginal impact on government expenditures. The results also suggested that positive oil price shocks increase industrial output by decreasing the price of imported inputs and negative oil price shocks reduce industrial output due to the higher price of imported inputs.

Aye et al. (2014) examined the effect of oil price shocks on the manufacturing production of South Africa by utilizing monthly data on oil prices and manufacturing production over the period February 1974 to December 2012. For this purpose, a modified bivariate VAR, GARCH-in-Mean VAR, and maximum likelihood tests were applied. The results

indicated that oil prices negatively affected South African manufacturing production and the response of manufacturing production towards the positive and negative oil price shocks were asymmetric.

Hamdi and Sbia (2013) study the dynamics among oil revenues, government spending, and growth in Bahrain. The authors find that oil revenues remain the principal source for growth and the main channel through which government spending is financed. Dizaji (2014) examines the effects of oil shocks on government expenditures and government revenues in Iran. The author finds that causality runs from oil revenues to government total expenditures. Their results also reveal that the contribution of oil revenue shocks in explaining the government expenditures is stronger than the contribution of oil price shocks. Akanbi and Sbia (2017) find empirical evidence of the effects of fiscal policy on the current accounts of oil exporting countries. Medina (2016) study the impacts of commodity price shocks on fiscal policy indicators in Latin American and find that fiscal aggregates rise in response to positive shocks to commodity prices. (Medina.L, 2016)

3. Social Accounting Matrix:

The social accounting matrix is a complete accounting system to represent a particular economy in a given period.

It is an analytical tool in national accounting to measure, present, analyze and interpret the benefits and costs in the economy of a given society, in order to evaluate its performance and determine its contribution to the well-being of society.

As stated in the United Nations System of National Accounts the matrix covers six main types of accounts: factors of production, economic units, economic sectors, products, capital accumulation and the outside world. (Nations, 1993)

It is presented in the form of a table or square matrix, which gives a complete and numerical picture of the most important macroeconomic aspects of a given economy over a given period of time. (Ismael, 2007)

The social accounting matrix belongs to the family of economic tables, such as the table of entries and exits, the general economic table. On the one hand, it provides a clear overview of the various transactions and exchanges that take place in a particular economy, On the other hand, decision-makers have an accounting framework for the analysis of economic policy and the easy choice of policy. (autres, 2001)

Matrix data come from national income accounts, various economic tables such as the table of inputs and outputs, census data, household surveys, public finances and foreign trade, such as the balance of payments. The United Nations System of National Accounts includes guidelines for the development of the social accounting matrix.

It is not easy to give a specific concept to the social accounting matrix, but it is a very important accounting framework, because they allow the development of all economic accounts by clarifying the production flows for all industries, factors of production as well as the calculations of incomes and expenditures for different economic units .

This is represented by a dual entry system each row in the matrix is represented by row and column, where the row represents the income and the column represents the expenses, the total flows in the row must be equal to the total flows in the column.

Although the matrix has a common form and structure, it can be disaggregated and subdivided into sub-accounts or by adding new accounts, depending on the nature of the economy studied and the problem identified, as well as the availability of data and information.

The social accounting matrix was first designed in the 1960s, a Cambridge University research team completed an English economic matrix whose data was used to solve the early growth models and used for purposes academic.

The first practical applications of the social accounting matrix date back to the mid-1970s, when a research team from the International Labor Office created a matrix for the Sri Lankan economy under the supervision of economists Richard Stone and GeeryPyatt.

4. The theoretical structure of the social accounting matrix:

The social accounting matrix is a square table with two entries for a given year, the different accounting flows are recorded from the income and expenditure of the economy studied. Revenues are given in lines indicated by i, expenses in columns are indicated by j.

The internal compatibility of the accounting nature of the social accounting matrix is guaranteed for each account , general revenues are the same as overhead.

$$\sum_{j} t_{ij} = \sum_{i} t_{ki}$$

Total Revenue = Total Expenses

4.1 The account of the factors of production:

The production factor account includes labor and capital and can be divided into sub-accounts. For example, the workforce can be divided into skilled and unskilled labor, depending on the needs of the study and the availability of data.

4.2 The account of economic units (economic agents):

This account includes activities for families, institutions, government and the outside world.

4. 3 The activity account:

The activity account includes income from the sale of goods and services in domestic and foreign markets. These revenues are spent on the purchase of intermediate goods, raw materials and factors of production, as well as for the payment of taxes.

4.4 Account of (goods and services):

The product account represents a department store that buys goods and services from local and foreign production activities and sells them to families, government, institutions and the outside world.

4. 5 Capital accumulation account (investment / savings):

The capital account includes the savings of families, corporations, the state and the outside world; expenditures are capital expenditures by gross capital accumulation, changes in inventories and funds transferred abroad.

4. 6 Account of the outside world:

Its income includes income from the goods and services account (imports) and transfers by economic units, expenditures include exports and transfers to various economic units.

Thus, the social accounting matrix is an analysis of all the accounting processes that take place during a given period and usually a year.

The information provided by the analysis makes it possible to analyze the impact of economic policies and to facilitate the choice of policies by decision-makers.

5. Close the social accounting matrix:

Different statistical approaches used in the creation of branch accounts, institutional sectors result in a difference between the balances of the different accounts.

The preparation of the various accounts is accompanied by a systematic review of the overall coherence of the system.

It is about balancing the supply and use of accounts by balancing the product accounts to reach the final overall balance of the social accounting matrix.

6. Reconciliation and balancing of the social accounting matrix:

The next step in developing or building of social accounting matrix is to balance all the matrix inputs generated by the expenditure and revenue calculations, that is, to balance all the total values of columns and rows.

However, before constructing the exact social accounting matrix that can be considered the appropriate data set for the computable general equilibrium model; some adjustments need to be made.

In order to align the matrix with the computable general equilibrium model, the aggregate social accounting matrix of an economy is considered an important element before preparing the ground for the discussion of the equations of the basic computable general equilibrium model.

7. The importance of the social accounting matrix in defining activity multiples:

7.1 The Leontief multiplier:

Multipliers measure the impact of additional demand tests and Leontief multiples that take into account tribal and distant productive links, which are required exclusively for intermediate consumption, it is recognized that each sectoral production requires fixed rate intermediate consumption noted aij. If we have:

$$X_{ij} = a_{ij} + X_j$$

Where X_{ij} represents the production in sector i sold in sector j as intermediate consumption and Xj the total production in sector j.

In this case, we assume that the economy is closed and that final and intermediate demand is satisfied by their local production needs. The balance between supply and demand in each sector is written as follows:

$$X_i = \sum_{j=1}^{n} a_{ij} X_j F_i$$

Or F is the beam of demand:

$$X = AX + F$$
$$(I - A) X = F$$
$$X = (I - A)^{-1} F$$

Or: $(I - A)^{-1}$is a multiplier matrix of Leontief

8. The social accounting matrix of the Algerian economy for 2013:

In this section, we will present the social accounting matrix for the Algerian economy in 2013, the selection of this year as a reference year is explained on the basis of the available data of input and output tables published by the national statistics office for the year 2013.

8.1 Data sources used:

The sources used to construct the social accounting matrix are first an input-output table for the year 2013 which is originally a table representing a balance of resources for the use of goods and services and various data on intermediate consumption and value-added analysis to compensate for wages.

This table includes 19 activity sectors according to the functional classification established by the system of Algerian economic accounts as well as a table for the production account and the accounts (operation of the insurance companies - operation of the banks - real estate - public administration).

The second data source used is the 2013 General Economic Table, this table includes four accounts: the production account, the operating account, the income and expenditure account and the investment account according to the Algerian economic calculation system. The general economic picture for 2013 includes five clients: companies and similar companies, households and individual institutions, public administrations, financial institutions and the other world.

In addition to these two important sources of data in the creation of the social accounting matrix in general, we have also used other publications of the National Statistical Office as well as reports on the economic situation published by the Economic Council and social national.

8.2 Accounts of the social accounting matrix for the year 2013:

The matrix we constructed includes fourteen sectoral activities from the 19 activity groups of the 2013 Input-Output Table: Agriculture, Forestry, Fisheries (01), Petroleum Sector (03) and the Petroleum Services and public works (04).

The industrial sector is composed of a group of industrial branches for the input-output table for the year 2013 designates the industries of steel, mechanical, metallurgical and electrical (06), Industry of building materials (07), Chemistry Industrial, Plastic and Rubber (09), Food Industry (10), Textile Industry, Apparel and Socks (11), Leather and Footwear Industry

(12), Wood, Paper and Cork Manufacturing (13), Miscellaneous Industries (14), Mines and quarries (05).

The service sector includes transportation and communications (15), commerce (16), hotels, cafes, restaurants (17), institutional services (18), family services (19), the last section the Directorate of Water Power (02), Buildings, Public Works (08).

We explain the selection of this group to the nature of the problem studied and the nature of the model used, which requires at least ten sectors as well as the nature of the characteristics of the national economy.

The rest of the accounts belong to two accounts: the VAT account, the customs duties on the imports, the calculation of the income tax and the remaining accounts for the agents of production: hand, money and capital, and finally a special savings-investment account.

9 .Computable general equilibrium models applied to international trade:

The general equilibrium model is a complex system of mathematical equations illustrating and visualizing the nature and functioning of an economy based on the neoclassical economic theory of general equilibrium, a detailed description of production techniques, behavior and consumer preferences. Describe the optimal behavior of economic decision-making units or economic units (usually families, businesses, governments and the outside world).

The numerical solution of the model is obtained by using data from the social accounting matrix, an accounting table based on the double input system known in the national accounts for the representation of an economy in a given period of time.

This makes the model computable, and the model system is solved from simultaneous equations in real time using software with clear and easy-to-use language. The computable general equilibrium model is therefore applied to the theory of general equilibrium on the data of the social accounting matrix. (B.Ravikumar, 2016)

Among these models, the Johansen Leif model in 1960 for the study of economic growth in Norway and the Harberger model in 1962 to study the impact of tax policy on corporate profits in the United States, this approach is used as an analytical tool to study the effects of the implementation of long-term economic policies such as the liberalization of foreign trade, the introduction of a new type of taxation in the tax system and other policies economic.

Since the early 1980s, much work has been done using this modeling technique using advanced computer programs such as the Comprehensive Modeling System and the General Algebraic Modeling Process (GAMS).
Even the small type of general equilibrium models can be calculated, it can also be solved in a framework-based spreadsheet, such as Microsoft Excel.
Generally, in terms of international trade, there are two approaches to building computable general equilibrium models:

The construction of a multistate model in which each member of the integration structure is modeled in detail and interconnected by trade flows, for example the Bayat and Raownd models in 1984 for Malaysia and the construction of the famous model by Hicks 1988 in Australia. Kimble and Harrison in 1984 and Morgan in 1989 used multiregional models to analyze tax effects.

Jonas and Halley (1989) also presented a computable general equilibrium model for Canadian provinces that focuses on assessing the impact of government policies.

Derradov and Starn (1981) also developed a business valuation model, the best-known model for analyzing the trade liberalization problems of 34 industrialized and other developing countries, it has been used to assess the effects of reducing tariff barriers and non-tariff barriers.

Finally, we mention the Mirage model, built in 2002 to evaluate the European Union's trade policy with its environment.

Mirage is a multisectoral and multi-regional balancing model that includes elements of incomplete competition, product differentiation and foreign direct investment.

It is about building a model for the state where only the most involved partner is modeled, this model can only know the effects of integration by measuring the trade policy of this country with its partners to include it in the model.

In this section of the models includes the model of Boadway and Tridenic (1978) for Canada. and the famous model of Devris, Milo and Robinson (1982) from Turkey.

10. The structure of the computable general equilibrium model:

The computable general equilibrium model comprises four economic units: families, firms, governments (the state) and the outside world. (mourad, Manuel de comptabilité nationale, 1987) .

Economic units are defined as a group of economic agents who follow identical or similar economic behavior in the exercise of their economic functions.

10. 1 families: The family is the cornerstone of this sector and consists of a group of people living in a single dwelling: Individual establishments are included in this sector, such as small traders, craftsmen, doctors, lawyers, its main function is the consumption and production of goods and services. (mourad, Cours de comptabilité nationale, 1979)

Families seek to maximize their utility, which is a growing function of consumption: the more we consume, the more we benefit, but at higher levels of consumption.

The value of income is determined by the value of the work provided by these families, the interest rate.

A typical family is considered to express the rest of all families, or a group of them is taken when they are distinguished in terms of categories in terms of level of education, level of income, nature of work and other standards. (Anne, 1997)

10.2 companies:

Companies are defined as units whose main activity is the production of goods and services (the distinction is made between companies and similar financial and non-financial corporations in accounting systems).

The goal of companies is to maximize their profits, as in the global standard models: the production functions are used to express the techniques used and to relate the inputs of the production process to the factors of production limited to most labor and capital models.

In some models, land, raw materials and other factors are added, when the model is created, these factors are selected according to the desired uses and according to the nature of the economy studied.

10.3 Public Administration (Government or State):

Public administrations represent the state or the government, their main role is to provide non-commercial, free or semi-free services and redistribute income through taxes, fees and assistance.

In calculable general equilibrium models as in global econometric models, the role of the state is considered outside the model, which does not mean that the state plays no role in the economy, but that he has a role of government expenditure.

10. 4 The other world:

The other world includes a group of non-resident economic units with relationships with resident units: families, businesses, governments, and other organizations.

Most of the computable general equilibrium models are based on Paul Armington's theory of 1969, and he found that the goods produced by the country and the imported goods were replaceable.

Consumers prefer to choose between domestic and imported products based on relative prices, with exports being imported from other countries and affected by the competitiveness of exported products.

In the case of the assumption that capital circulates freely, the interest rate is determined in the world economy, it is considered externally in the

model, which distinguishes the model from its theoretical framework since one of the prices of the economy studied is determined externally.

11. Using the social accounting matrix in the computable general equilibrium model:

The numerical solution of the model is obtained by using matrix data of social accounting, an accounting table based on the double entry system known in the national accounts for the representation of an economy in a certain period of time. (Kehoe.T.J, 1996)

This makes the model computable, and the model system is solved from simultaneous equations in real time using software with clear and user-friendly language, thus, the computable general equilibrium model is applied numerically to the theory of equation general equilibrium of social accounting matrix data.

Most of the equations in the model are derived from partial economic theory, in particular from the neoclassical general equilibrium theory, which determines how the quantities of goods and services offered are affected by price changes in all the problematic markets of the world.

On the other hand, the analysis of the behavior of economic units is part of the macroeconomic analysis, and thus the general equilibrium model derives from the means of analysis and from the basis of microeconomic theory to analyze phenomena and macroeconomic variables.

The general equilibrium model is often designed to study a specific subject according to the nature of the subject, the type, the form and the degree of detail of the model. (DufforJ.M, 1998)

The one-sector model and the multisectoral model, and between the single-economy model and the multi-economy model.

Since the general equilibrium models can be computed according to Walrasian equilibrium theory, it is possible to make changes in the models according to the specificity of the studied economy, develop assumptions about the behavior of economic units or productive activities in the economy and the impact of changes resulting from economic policies,

crises and shocks on the economy studied through the results obtained from the model.

12. The computable general equilibrium model proposed for the Algerian economy:

12. 1 Choice of the model:

We have proposed a calculable general equilibrium model of the Algerian economy, which is a set of nonlinear real-time equations submitted by Lofgren and All 2002 which like most other computable general equilibrium models belong to classical models general equilibrium centered on trade liberalization. Or commercial openness in developing countries, described by Dervis de Melo and Robinson in 1982.

It is a modular static model, which allows the implementation of a set of policy simulations to modify policies and other external conditions, and measure the impact of these changes.

The computable general equilibrium model was used to analyze the state of the Algerian economy in the direction of greater liberalization of the trading system and its interaction with various external shocks, the basic data for the model was the table of entries and exits for the year 2013.

12. 2 Mathematical formula of the model:

The computable general equilibrium model for the case of Algeria presented in this section is mathematically a set of nonlinear real-time equations, used by Lofgren and Al 2002.

For convenience, the equations are classified into four blocks or groups: price, output, goods, institutions, and system constraints that are:

12.2.1 Price block: This block contains price equations with internal variables that describe the demand and supply of the model.

12.2.2 Block of production and trade: The block of production and trade comprises four categories: national production and input use, distribution of domestic product for domestic consumption, domestic market, exports, compilation of supply on the local market (imports and local production sold locally) and defining the demand for the commercial inputs created by the distribution process.

12.2.3 Foundation block: This group consists of equations that determine the value-added flow of businesses, and finally households, these equations fill the inputs between institutions in Algeria's social accounting matrix, and this cluster contains several functions and equations for the aspect of the institution of the economy.

12.2 .4 Block the restriction of the system: it consists of:

- Factor markets;
- Markets for composite raw materials;
- Current account balance of the rest of the world in foreign currencies;
- Saving and investment;
- Price adjustment.

The basic model of this study comprises 14 sectoral activities, four institutional agents, two main factors of production, savings-investment, value-added tax, and customs duties. The 14 sectors of the table of entries and exits of Algeria for the year 2013 were regrouped as follows:

Agriculture Sector (01), Water Sector - Energy and Buildings, Public Works (02), Fuels Sector (03), Petroleum Services and Industry Sector (04) and Mining and Quarrying Sector (05), Iron and steel industry, Metallurgy and electricity (06), Construction materials industry (07), Chemical industries, Plastics and rubber (08), Food industry (09), Textiles, clothing and stockings (10), Leather and footwear (11) Wood, Paper and Cork Industry (12), Miscellaneous Industries (13), Services Sector (14).

The quantitative model representing the basic economy was constructed using the social accounting matrix of the year 2013.

13. Model execution and consistency test:

This model is solved in the General Program of the Linear Modeling System (GAMS). The consistency of the model is tested simultaneously. By solving this model, the program (GAMS) is used to find a range of prices, wages and exchange rates that respond to the complex set of non-linear equations (Lofgren et al 2002).

14. Simulation design and description:

In this section, we will present the different policy simulations that we would like to implement using a computable general equilibrium model.

The simulations that will be conducted mainly according to the realistic state of the economy have been tested to match the direction of the economy, the simulation applied in this study is shock of oil prices in the international market. (Sbia.R, 2017)

14.1 The rise and fall of world oil prices:

It is a simulation that aims to test the effect on the local economy, so that the rise and fall of the price of oil is one of the main tools of trade policy, is often used to correct the deficit and also to maintain the international reserve. (Dizaji.S.F, 2014)

Two types of price shocks will be presented, namely the increase in world oil prices by 10%, the 30% drop in world oil prices and the combination of these two scenarios with total trade liberalization. (Sbia.R H. a., 2013)

14.1 .1 The effect of the 10% increase in the price of oil:

14.1 .1 .1 Effects of a 10% increase in the price of oil on Local production: At the production level, we saw an increase in the product offering in most sectors, but the impact was negative in other sectors.

Table 1. Effects of a 10% increase in the price of oil on local production

- Unit (%) -

Local Production	Scen a3	Scen a3+c1
Total	2.303244	3.598917
SEC1-C	2.086231	2.878351
SEC2-C	10.93602	12.39823
SEC3-C	-0.06436	1.04395
SEC4-C	8.300689	10.27274
SEC5-C	-3.08704	-1.9078
SEC6-C	5.021705	6.987857
SEC7-C	6.296853	7.769271
SEC8-C	1.094529	2.866837

SEC9-C	5.212185	6.194788
SEC10-C	6.056439	5.759293
SEC11-C	1.139828	0.166455
SEC12-C	-0.92957	1.891457
SEC13-C	1.18311	2.176744
SEC14-C	1.142882	2.036673

Source: Among author's calculations using simulation results from GAMS software.

Table N° 01 shows that the volume of production in the water and energy, construction and public works sector has increased by 10.93602 per cent, in the petroleum services and public works sector of 8.300689 per cent, and the building materials sector of 6.296853 per cent.

All because of the correlation between production in these sectors and the revenue generated by the activity of the hydrocarbons sector.

Oil collection is one of the most important sources that the state uses in its budget to finance its expenditures, with investment in the construction and public works sector being considered one of the largest expenditures.

While rising oil prices have had a negative impact on production, especially in mines, quarries, woodworking, paper and cork, with a decrease of -3,08704% and -0,92957% respectively.

In the case of total trade liberalization, we note that production increased in all sectors, except for extractive industries, the increase in total output was estimated at 3.598917 percent.

Because of the increase in income of economic units, demand increases, so that imports increase to meet the needs of the local market, while exports decline, leading to a trade imbalance. this is what he proved Berument et al. (2010) in a study on Middle East and North African countries found the asymmetric effects of world oil price shocks on the gdp of Algeria, Iraq, Jordan, Kuwait, Oman, Qatar, Syria, Tunisia, and UAE to be positive and statistically significant, while positive but insignificant results were reported for Bahrain, Egypt, Lebanon, Morocco and Yemen.

14.1 .1 .2 Effects of a 10% increase in the price of oil on trade:

Table N° 02 shows that exports have declined in all exporting sectors because of the lower production in some of the mind increasing the supply of local products in the local market.

Table 2. Effects of a 10% increase in the price of oil on trade Unit (%)

	Imports		Exports	
The sectors	**Scen a3**	**Scen a3+c1**	**Scen a3**	**Scen a3+c1**
Total	13.4003	14.37724	-2.7281	-1.7081
SEC1-C	14.84772	15.33879	-23.198	-21.202
SEC2-C	20.8301	21.78889	-21.148	-19.174
SEC3-C	0	0	-1.0854	-0.0640
SEC4-C	0	0	0	0
SEC5-C	11.25409	12.62302	-22.662	-20.476
SEC6-C	13.05651	14.52002	-17.452	-15.478
SEC7-C	17.73857	19.07962	-24.846	-22.864
SEC8-C	11.39778	12.93672	-20.342	-18.363
SEC9-C	16.7028	17.68342	-25.251	-22.262
SEC10-C	12.4275	13.73049	-15.838	-14.036
SEC11-C	11.02451	12.55369	-20.791	-18.771
SEC12-C	9.175703	10.01594	-23.446	-20.257
SEC13-C	13.7295	14.97223	-26.596	-23.967
SEC14-C	13.55581	13.95487	-27.870	-24.260

Source: Among author's calculations using simulation results from GAMS software.

The decline in total exports was estimated at -2.7281% below the base level, but with total trade liberalization, this figure is estimated at -1.7081%. In the case of imports, there was a significant increase in all sectors in both cases, however, the rate of increase of the scenario Scenario 3 + c1, after the total liberalization (openness) of the exchanges, was greater than in the first scenario, this is due to the increase in revenue on the one hand and the decrease in prices due to the elimination of tariffs on the other hand, with an increase of 14.3774%.

14.1 .1 .3 Effects of a 10% increase in the price of oil on macroeconomic variables:

Table N° 03 shows the effect of the 10% increase in oil prices on the Algerian economy at the macro level as follows:

Table 3. Effects of a 10% increase in the price of oil on economic variables - Unit (%) -

	Scen a3	Scen a3+c1
Household income	6.720858	3.716228
Gross domestic product	6.57053	8.553603
Government income	4.729908	1.689185
Government savings	15.97374	3.831
Private consumption	5.720858	8.716228
The actual trade balance	-13.7305	-15.7461
Total employment request	2.12	1.35
Total investment	12.05548	5.013625

Source: Among author's calculations using simulation results from GAMS software.

Rising oil prices have led to increased hydrocarbon revenues, which has led to higher oil revenues, one of the most important sources of state revenue, the country's total income grew by 4.729908% and its savings increased by 15.97374%.

We also note that private consumption rose 5.720858% as household income rose 6.720858%.

Increasing savings will encourage investment in all sectors, as the model illustrates by increasing the total investment by 12.05548 percent.

We also note that total labor demand has increased by 2.12%, as has the gross national product, which has also increased by 6.57053%.

However, with total trade liberalization, we note that the majority of economic variables have been compared to the situation of high oil prices.

With the exception of private consumption and gross domestic production, which rose by 8.716228 and 8.553603 per cent respectively compared to the reference situation. This is what he proved Hamdi and Sbia (2013) also Dizaji (2014).

14. 1.2 The effects of the 30% drop in oil prices:

14. 1 .2 . 1 The effects of the 30% drop in oil prices on local production :

At the production level, we saw an increase in production in some sectors, but the impact was negative in most other sectors.

Table 4. The effects of a 30% drop in oil prices on Local production

- Unit (%) -

Local Production	Scen b3	Scen b3+c1
Total	-5.74304	-2.74675
SEC1-C	0.636102	1.527275
SEC2-C	-6.80838	-2.43215
SEC3-C	-2.09406	-0.07034
SEC4-C	-8.58672	-6.61268
SEC5-C	12.81398	13.75143
SEC6-C	-9.07637	-7.11906
SEC7-C	-12.3235	-10.3534
SEC8-C	13.68851	14.94448
SEC9-C	-9.8327	-7.85122
SEC10-C	-7.00885	-5.20593
SEC11-C	6.593298	4.631965
SEC12-C	8.39467	9.374702
SEC13-C	5.847239	6.23985
SEC14-C	7.38766	8.080726

Source: Among author's calculations using simulation results from GAMS software.

Table N ° 04 shows that the volume of production has decreased in some sectors, particularly those of water, energy, construction and public works of -6.80838%.Petroleum services and public works sector -8.58672% and building materials sector -12.3235% because of the link between these sectors and revenues from the hydrocarbons sector.

We also saw a drop in production in the fuel sector-2,09406%,steel, mechanics, metallurgy and electricity -9.07637%,food, tobacco and sulfur, textiles, clothing and socks respectively -9.8327% and -7.0885%.

We note that these negative ratios reflect the response of these sectors to the impact of the decline in world oil prices, which has had a positive impact on production in other sectors.

In the case of total liberalization of trade, there is a clear improvement in production in sectors that have experienced a decline in the previous situation, so the decline from baseline was lower than the oil price. This is what he proved Peersman, G., Van Robays, I., 2012

The decline in total output in the case of total trade liberalization was estimated at -2.4675 per cent.

14.1 .2 .2 The effects of the 30% drop in oil prices on trade:

The lack of income of economic units in turn leads to a reduction in the final demand of families, a reduction in imports and an increase in exports due to the lack of requirements in the domestic market.

Table 5. The effects of the 30% drop in oil prices on trade

- Unit (%) -

	Imports		Exports	
The sectors	**Scen b3**	**Scen b3+c1**	**Scen b3**	**Scen b3+c1**
Total	-31.839	-30.458	2.12846	3.5068
SEC1-C	-35.197	-34.203	22.11033	23.06471
SEC2-C	-45.6208	-43.646	39.30623	40.39384
SEC3-C	0	0	2.37204	3.24695
SEC4-C	0	0	0	0
SEC5-C	-34.6833	-32.070	35.00908	36.7896
SEC6-C	-31.5065	-28.5387	22.20033	24.09706
SEC7-C	-40.7858	-38.8061	27.26623	28.94071
SEC8-C	-23.9682	-21.9956	24.21926	26.10372
SEC9-C	-38.815	-37.8277	30.54067	32.04614
SEC10-C	-23.131	-22.8129	16.43615	15.84281
SEC11-C	-13.3257	-11.3814	26.97327	25.07587
SEC12-C	-18.2582	-17.2734	20.52685	21.47243

SEC13-C	-29.7165	-29.0214	35.46563	36.12662
SEC14-C	-34.3005	-33.3047	33.90433	34.2876

Source: Among author's calculations using simulation results from GAMS software.

According to Table N° 05 It is clear to us that exports have increased in all export sectors due to the decline in the supply of local products on the local market and their export. The total increase in exports was estimated at 2.1284%, which again increased in the case of total trade liberalization to 3.5068 percent.

As we observe from Table N ° 05 that the rate of change of imports has decreased in all importing sectors, due to the reduction of demand on the domestic market, this resulted in a lack of absorption of various import and local products, with a rate of decline of 31.839%. This is what he proved Medina (2016).

14.1 .2 .3 The effects of the 30% fall in oil prices on macroeconomic variables:

Table N ° 06 shows the effect of the 10% fall in oil prices on the Algerian economy at the macro level as follows:

Table 6. Effects of a 30% drop in oil prices on economic variables - Unit (%)

	Scen b3	**Scen b3+c1**
Household income	-13.7763	-15.7803
Gross domestic product	-7.73162	-1.75025
Government income	-5.1499	-7.19665
Government savings	-26.725	-68.531
Private consumption	-10.7763	-1.78028
Total employment request	-1.9	-0.14
Total investment	-18.0125	-22.0599

Source: Among author's calculations using simulation results from GAMS software.

Household income decreased by 13.7763 per cent which in turn affected private consumption, which in turn decreased by 10.7763 per cent, mainly due to the low wage rate due to the decrease in total demand for electricity. employment of 1.9%.

We also note that government revenues decreased by 5.1499%,while savings fell by 26.725% due to lack of fuel revenues due to lower world oil prices. This has had a negative impact on investments, which decreased by -18.0125 percent.

This negative impact on all economic variables increases more strongly in the case of total trade liberalization, thus increasing the decline of all variables. With the exception of private consumption and gross domestic production, which are characterized by a marked improvement over the decline in oil prices.

Finally, we conclude that the fall in the price of oil negatively affects most of the sensitive economic sectors such as the fuel sector and the construction and public works sector, in addition to deteriorating indicators reflecting the standard of living of individual incomes and high unemployment and that Cuñado, J., Jo, and S., Pérez de Gracia. F reached on 2015.

Several factors influence the results of the percentages found in the variation of the value of the variables, because of the shortcomings that characterize the model and the most important ones such as: the model is static it must be developed in a dynamic model, so that we can enter the temporal dimension on the variables.

It is not possible to know the dynamic changes in the values of the variables over time, such as the change in economic growth in gross domestic output and other variables in the time dimension.

15. Conclusion:

With regard to the oil price shock scenario on the world market:

In the first simulation, we found that the tax revenues generated by the 10% increase in world oil prices were a reason to rely on the hydrocarbon sector and continued to depend on it instead of encouraging other sectors to produce like the agricultural sector.

The decline in the unemployment rate and rising incomes and savings of economic units has caused an increase in demand for private consumption and investment, Imports and rising exports have fallen in all

kinds of products, leading to higher prices, and so the results of these simulations reflect the reality of fluctuations in the world price of oil in the Algerian economy.

The second simulation using the model was the 30% decline in oil prices, as we saw a decline in the level of production and value-added in most sectors except in certain sectors such as agriculture, mining, Rubber.

We also saw a drop in private consumption and a decline in the level of investment, which led to lower prices and a lack of imports, because of low income and savings for all economic units with an increase in the unemployment rate and the number of unemployed.

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17. Appendices:

Appendice 1. Scenario codes and simulation definition

Scenario code	Simulation specifications
Scen a3	The 10% increase in the price of oil in the global market
Scen b3	The 30% drop in the price of oil in the global market
Scen a3+c1	The 10% increase in the price of oil in the world market with the elimination of tariffs in all import sectors
Scen b3+c1	The 30% drop in the price of oil in the world market with the elimination of tariffs in all import sectors

Appendice 2. Equations and variables of the model

Model equation:

Price block:

$$PM_c = pwm_c(1 + tm_c) \cdot EXR(1)$$

$$PE_c = pwe_c(1 + te_c) \cdot EXR$$

$$PQ_c QQ_c = [PD_c QD_c + PM_c QM_c](1 + tq_c) \quad (3)$$

$$PX_c \cdot QX_c = PD_c QD_c + PE_c QE_c \quad (4)$$

$$PA_a = \sum_{c \in C} PX_{ac}\, \theta_{ac} \quad (5)$$

$$PVA_a = PA_a - \sum_{c \in C} PQ_c\, ica_{ca} \quad (6)$$

Block of production and trade:

$$QA_c = ad_a \prod_{f \in F} QF_{fa}^{\alpha_{fa}} \quad (7)$$

$$WF_f WFDIST_{fa} = \frac{a_{fa} PVA_a QA_a}{QF_{fa}} \quad (8)$$

$$QINT_{ca} = ica_a QA_a \quad (9)$$

$$QX_c = \sum_{a \epsilon A} \theta_{ac}\, QA_a \quad (10)$$

$$QQ_c = aq_c \left(\delta_c^q QM_c^{-p_c^q} + \left(1 - \delta_c^q\right) QD_c^{-p_c^q}\right)^{\frac{-1}{p_c^q}} \quad (11)$$

$$\frac{QM_c}{QD_c} = \left(\frac{PD_c}{PM_c} \frac{\delta_c^q}{\left(1 - \delta_c^q\right)}\right)^{\frac{1}{1+p_c^q}} \quad -1 < p_c^q < \infty \quad (12)$$

$$QQ_c = QD_c (13)$$

$$QX_c = at_c \left(\delta_c^t QE_c^{p_c^t} + (1 - \delta_c^t) QD_c^{p_c^t}\right)^{\frac{1}{p_c^t}} \quad (14)$$

$$\frac{QE_c}{QD_c} = \left(\frac{PE_c}{PD_c} \frac{(1 - \delta_c^t)}{\delta_c^t}\right)^{\frac{1}{p_c^t - 1}} \quad -1 < p_c^t < \infty \quad (15)$$

$$QX_c = QD_c \quad (16)$$

Foundation block:

$$YF_{hf} = shry_{hf} \sum_{a \epsilon A} WF_f WFDIST_{fa} QF_{fa} \quad (17)$$

$$YH_h = \sum_{f \in F} YF_{hf} + tr_{h,gov} + EXR \cdot tr_{h,row} \quad (18)$$

$$QH_{ch} = \frac{\beta_{ch}(1 - mps_h)(1 - ty_h)YH_h}{PQ_c} \quad (19)$$

$$QINV_c = qinv_c \cdot IADJ \quad (20)$$

$$YG = \sum_{h \in H} ty_h \cdot YH_h + EXR \cdot tr_{gov,row} + \sum_{c \in C} tq_c \left(PD_c QD_c + PM_c QM_c\right) + \sum_{c \in CM} tm_c EXR \cdot pwmc_c \cdot QM_c + \sum_{c \in CE} te_c \, EXR \cdot pwe_c \cdot QE_c + ygi \quad (21)$$

$$EG = \sum_{h \in H} tr_{h,gov} + \sum_{c \in CE} PQ_c \cdot qg_c \quad (22)$$

Block of equilibrium system:

$$\sum_{\propto \in A} QF_{fa} = QFS_f \quad (23)$$

$$QQ_c = \sum_{\propto \in A} QINT_{ca} + \sum_{h \in H} QH_{ch} + qg_c + QINV_c \quad (24)$$

$$\sum_{c \in CE} pwe_c \cdot QE_c + \sum_{i \in I} tr_{i.row} + TASV = \sum_{c \in CM} pwm_c \cdot QM_c + irepat + yfrepat_f \quad (25)$$

$$\sum_{h \in H} mps_h \cdot (1 - ty_h) YH_h + (YG - EG) + EXR \cdot FSAV = ygi + EXR \cdot irepat + \sum_{c \in C} PQ_c \cdot QINV_c + WALRAS \quad (26)$$

$$\sum_{c \in C} PQ_c \cdot cwts_c = cpi \quad (27)$$

L'ancrage territorial des entreprises: La logique du choix des facteurs de localisation, Une étude empirique auprès des PME de la wilaya d'Oran

The territorial anchoring of companies: the logic of the choice of localization: An empirical study of SME in Oran wilaya

REDJEM Kamilia [1], BENDAHO Abdelkader [2], MIHOUB AIT HABOUCHE Ouahiba[3]

[1] FSECSG université d'Oran 02, (camelia.rdj@gmail.com)

[2]FSECSG université d'Oran 02, (bendaho.aek@gmail.com)

[3] FSECSG université d'Oran 02, (wmihoub12@gmail.com)

Received: 14/09/2018 **Accepted:** 08/12/2018 **Published:** 23/01/2019

Résumé

Notre article vise à étudier les choix des facteurs de localisation des entreprises. Il s'agira de sélectionner les facteurs territoriaux les plus importants pour l'implantation des entreprises dans le territoire Oranais. Pour cela notre étude s'appuie sur, d'une part, une revue de littérature sur la création des PME et l'ancrage territoriale, et d'autre part sur les résultats d'une enquête de terrain menée auprès d'un échantillon d'entreprises activant à Oran et appartenant à différents secteurs d'activité.

Cette dernière a montré que les motifs de la création des entreprises sont en premier degré un issu pour augmenter leurs revenus et s'échapper du chômage , aussi le choix de localisation des entreprises Oranaise est déterminé non seulement par les facteurs traditionnels, mais aussi, des raisons personnelles à caractère social.

Mots clés : Ancrage territoriale, facteurs de la localisation, PME, enquête.

JEL Classification: R30, L26, O18

Abstract

Our paper aims to study the choices of companies' location factors of location. It will be selected the most important territorial factors of companies in the Oran territory. For that our study is based on, firstly, a

Auteur correspondant: Kamilia REDJEM, **Email** :camelia.rdj@gmail.com

review of literature on the creation of SMEs and the territorial anchoring, and in second place an investigation of ground near a sample of companies belonging to different sectors of activity.

Our results indicate that the reasons for the creation of the companies are in first degree resulting to increase their incomes and to escape from unemployment, also the choice of Oranian localization of the companies is determined by the traditional factors (availability of their sources, by qualified work, of basic infrastructures…) and their family responsibility.

Keywords: Territorial anchorage, choice of location of SMEs, factors of location.

JEL classification: R30, L26, O18

1. Introduction

La réflexion sur le rapport entre mobilité et ancrage territorial des entreprises a été largement renouvelée par les approches de la proximité développées en sciences sociales et économiques depuis vingt ans.(Pascale, 2015)

L'émergence du phénomène de la localisation dans la théorie économique date de 1929 grâce aux travaux d'Alfred Weber. Ses travaux sont considérés comme une référence dans ce domaine mais ont connu ultérieurement plusieurs modification voir (Lösh, 1948), (Hoover, 1948), (Izard, 1956).

Ce phénomène appliqué aux entreprises correspond donc aux processus de sélection de l'emplacement jugé optimum pour des activités socio-économiques spécifiques (Damborsky & Jetmar, 2009). En effet, chaque localité dans le monde offre un spectre de ressources spécifiques et chaque activité sociale ou économique est caractérisée par différents besoins. Par conséquent, la localisation optimale se trouve là où l'accessibilité des ressources est capable de satisfaire tous les aspects de la demande des entreprises.

Par ailleurs, le développement des réseaux de transport et des nouvelles technologies de l'information et de la communication (NTIC) ont grandement augmenté les spectres de localisation pour les entreprises d'un pays. (Buchwalder, 2009)

La force des PME viendrait alors de leur ancrage fort au territoire dans lequel elles puisent les ressources techniques et financières mais aussi humaines, culturelles et sociales qui leur permettent de partir mieux armées vers de nouveaux marchés. C'est en ce sens que nous nous sommes focalisés dans ce travail sur l'étude et la sélection des facteurs territoriaux qui sont à la base de la création et la localisation des entreprises Oranaise, à partir d'un questionnement : **quels sont les déterminants à la localisation des entreprises au sein du territoire Oranais ?**

Ce questionnement nous conduit à une réflexion sur les facteurs territoriaux de la localisation des entreprises. Partant de là, notre démarche repose sur deux hypothèses principales selon la première, la disponibilité de ressources et d'infrastructures dans le territoire oranais stimule la localisation des entreprises.

La deuxième, une forte agglomération économique et urbaine stimule l'implantation des entreprises au sein du territoire oranais.

Dans cet article, nous présenterons d'abord un cadre théorique sur la création d'entreprises et ses rapports au territoire .puis nous introduisant les fondements théorique sur l'ancrage territorial. Enfin, nous allons déterminer les facteurs territoriaux de l'implantation des entreprises dans la région oranaise. Notre méthodologie empirique a pris la forme d'une enquête par questionnaire auprès de 49 entreprises oranaises afin de répondre à notre problématique.

2. La création d'entreprises et ses rapports au territoire

2.1 Bref retour historique sur la problématique

La dialectique de la création d'entreprises et ses rapports au territoire a été abordés par les spécialistes en économie régionale depuis des années, ont intéressés plus particulièrement sur les disparités régionales en matière de créations d'entreprises. Dans l'histoire des sciences économiques, la création d'entreprises a émergée au milieu des années 1970 comme problématique de recherche en économie régionale. Mais elle n'est reconnue que depuis les années quatre-vingt grâce aux travaux et publications pionnières des économistes, citons Cross (1981), Storey (1982 ; 1984), Keeble et Weber (1986) et Johnson (1986). Qui ont devenues des

références classiques. (Dejardin, 2010)

Dans le monde de l'entreprise, il y avait qu'une vision dominante, celle la grande taille d'entreprises et ses avantages relatifs en termes d'économies d'échelle etde diversification des activités. La crise des années soixante-dix, a remis en cause cette conception au profit des petites entreprises. En effet, pour (Julien, 1997) «*toutes les données convergent pour démontrer la montée autour de 1970 d'un nouveau dynamisme des PME dans les pays industrialisés* ».(Julien (1997) in Amghar , 2009)

Vers les années quatre-vingt, et grâce à l'accélération de l'internalisation de l'économie et l'émergence de technologies nouvelles, le contexte général change. Ce n'est plus dela croissance économique ou la politique régionale orientée qui importent mais bien la création d'emplois. A ce sujet, les grandes entreprises créent moins qu'auparavant, et les petites et moyennes entreprises deviennent plus dynamiques. L'étude de l'économiste américain (Birch, 1979) in (Dejardin, 2010)confirme les avantages des PME par rapport aux entreprises de grande taille dans le domaine de la création d'emplois pour la période 1969-1976.(Dejardin, 2010)

Selon (Maillat, 2006), « .... *C'est ainsi que ces changements structurels ont provoqué, dans certains pays, un renversement spatial caractérisé par le déclin d'anciennes régions industrielles et l'émergence de nouvelles régions prospères dans d'autres parties du même pays*. » (Maillat, 2006).

Ces nouvelles régions dépendent dans leur succès d'un développement de type endogène basé sur « ... *l'utilisation des ressources locales, la capacité de contrôle au niveau local du processus d'accumulation, le contrôle de l'innovation, la capacité de réaction aux pressions extérieures et la capacité d'introduire des formes spécifiques de régulation sociale au niveau local favorisant les éléments précédents*» (Dejardin, 2010, p. 61)

Dans ce contexte, la création d'entreprises tout en demeurant un choix individuel, répond à une identité et à un développement local.

2.2 Les déterminants territoriaux de la création d'entreprise

Les déterminants territoriaux de la création des entreprises sont le résultat de la combinaison de plusieurs facteurs. Certains chercheurs ont essayé d'identifier ces facteurs de la création d'entreprises, même si cette tâche n'est pas aisée. En effet, la spécification de ces déterminants territoriaux nécessite une optique axée sur les approches spatiales et/ou sectorielles et à des niveaux aussi bien microéconomique que macroéconomique (Giacomin & Guyot, 2007)

Dans le tableau N° 1 nous synthétisons ces déterminants

Table N° 1. Les déterminants de la création des entreprises

Dimension	Facteur	Effet
Macroéconomique	taux de croissance réel du PIB	D'après (Robson, 1996), ce taux a un effet positif sur la création des entreprises. Mais (Noorderhaven, 2004) fait remarquer que le niveau élevé de PIB par habitant est lié à un faible niveau d'auto-emploi. (Giacomin & Guyot, 2007, p. 5).
	le taux de chômage	Seulement (Giacomin, 2007) affirme que le taux de chômage aurait plutôt une influence négative sur la création des entreprises. Plusieurs auteurs ont contredit cette idée. (Fotti et Vivarelli, 1993) qui ils ont dit que le chômage dans une région est un facteur stimulant pour le fait entrepreneurial.
Microéconomique	Le chômage	Le chômage est un facteur de création d'entreprises. Selon l'étude réalisée par (Mason, 1989) sur les motivations individuelles à la création d'entreprises. Ce qui est connue comme la théorie push-pull[1].

[1]La théorie push-pull est un modèle réalisé pour expliquer les motivations individuelles à la création d'entreprises. *«…Cette étude a été menée sur deux groupes d'individus, le premier ayant créé leurs entreprises en période de pré-récession (1976-1979) et le second groupe composé d'individus ayant créés leurs entreprises en période de récession (période post 1979). De sorte qu'en période de pré-récession, les individus seraient*

		Les travaux de (Ritsilä et Tervo, 2002), affirment l'impact du chômage sur la création d'entreprises. Où les individus se trouvant dans une situation de chômage depuis une courte période (soit de 1à 8 mois) présentent une propension à créer des entreprises plus élevée que les chômeurs de longue durée (soit de 9 à 12 mois)

Source : préparé par les Doctorants s'appuyant sur la référence (Giacomin & Guyot, 2007)

Dans une optique microéconomique, même si le chômage est un facteur clé de création d'entreprises, d'autres facteurs interviennent à savoir la précarité de l'emploi, la faiblesse des salaires ou l'absence de perspectives professionnelles. Par ailleurs, il est important de ne pas négliger la composante identitaire dans la création d'entreprise ainsi que les caractéristiques socioculturelles qui ont un impact sur le mode de perception de la réalité.(Giacomin & Guyot, 2007)

3. L'ancrage territorial des entreprises : un cadre conceptuel

3.1 Définition de l'ancrage territorial

Le concept d'ancrage territorial permet d'étudier la rencontre productive et les relations qui se nouent entre une filiale étrangère et son territoire d'implantation (Serval, 2015).

L'ancrage territorial se définit au sens large comme « l'ensemble des liens réciproques qui unissent une activité économique (acteur, entreprise, filière…) avec un territoire » (FRAYSSIGNES, 2005).

Le concept d'ancrage territorial revisite ainsi la notion de localisation pour la compléter par celle de territorialisation (Franc, 2010) et pose le postulat d'une rationalité limitée (Simon, 1955) et située des acteurs pour une cognition distribuée (Laville, 2000).

motivés par des facteurs pull, tandis qu'en période de récession ils seraient motivés par des facteurs push. » (Naïma & DJENANE, 2016)

3.2 Théories de la localisation des entreprises

a) Marshall et l'étude des économies externes :

Dans ses «Principes d'Economies Politiques» (1890), **Alfred Marshall** retient deux causes qui prévalent à l'installation d'entreprises sur un lieu particulier :

Les causes internes au territoire (climat, matières premières) et externes (spécialisation des artisans, demande de qualification des mains-d'œuvre).

b) Analyse Béhavioriste :

Dans l'analyse Béhavioriste, la localisation est le résultat d'un processus de décision. L'information dont dispose le décideur est limitée et coûteuse. La rationalité limitée de la localisation est donc contrainte par ces coûts. Le choix optimal n'est plus qu'un choix «satisfaisant».

3.3 Attractivité territoriale, facteurs de localisation :

a) La localisation :

Résultat d'une convergence entreprise-territoire les facteurs de localisation dans l'espace géographique ont notamment été étudiés par Alfred Weber (stratégie de minimisation des coûts), Christaller (théories des places centrales) ou par les partisans de l'équilibre spatial de l'école des sciences régionales des années 1960 et 1970. La localisation est le résultat d'une convergence firme-territoire. Les avantages spécifiques des firmes sont à rapprocher de la notion plus générale d'avantages compétitifs. Selon Porter, ces avantages peuvent provenir de deux sources : la réduction des coûts de production (innovations technologiques ou nouveaux facteurs de production) et la différenciation des produits (marques, publicité, concurrence monopolistique). Les avantages à la localisation des territoires doivent être englobés dans les avantages comparatifs des pays.

b) Choix de la zone d'implantation :

Les choix de la localisation d'une entreprise dépendent du nombre d'implantations déjà réalisées et de la nature de l'implantation à effectuer. Lors d'une première implantation, les risques sont plus élevés et la connaissance du terrain étranger est moins développée.

Il existe de nombreuses typologies des facteurs de localisation. Chaque firme peut posséder sa propre grille. On peut retenir sept grandes familles de facteurs globaux ou intangibles:

- Les facteurs généraux: situation politique, économique, sociale, présence d'autres sociétés étrangères, force du secteur, proximité du marché, agences de développement, facilités de crédit.
- Les conditions de travail : réglementation des embauches et licenciements, permis de travail, présence d'une main-d'œuvre qualifiée, universités, centres de recherche.
- Les critères géographiques de la localisation : environnement rural, urbain, banlieue, emplacement prestigieux, technopoles, parcs d'activités, etc.
- Les voies de communication : proximité et qualité du réseau autoroutier, ferroviaire, port maritime, de transports en commun, d'un aéroport, congestion de la circulation.
- Les télécommunications : disponibilité et qualité des lignes et réseaux de communication.
- Les fournitures : Disponibilité et fiabilité de l'énergie, du gaz, de l'eau, traitement des déchets, réseaux de distribution, matières premières, sous-traitants.
- Les conditions de vie : Logements, hôpitaux, écoles, hôtels, infrastructures culturelles et de loisirs, magasins.

c) Alfred Weber et la localisation industrielle :

Alfred Weber (1909) élabore une théorie de la localisation industrielle. Pour Weber, la meilleure localisation ou la localisation optimale correspond à celle qui minimise les coûts de production. Sa théorie est fondée sur trois postulats de base (Mérenne-Schoumaker, 1991):

- un grand nombre de matières ont une localisation spécifique, on ne peut pas les trouver partout (sauf l'eau et l'air considérés comme des matériaux « ubiquistes » que l'on trouve partout) ;
- les marchés des produits finis sont localisés en certains points et la concurrence est parfaite ;

- les bassins de main-d'œuvre sont localisés et peuvent offrir un nombre illimité de travailleurs à un certain taux de salaire. L'espace est totalement uniforme culturellement, politiquement et spatialement.

3.4 Les facteurs de localisation des entreprises :

Il existe une multitude de facteurs susceptibles d'influencer sur la localisation des entreprises. Le tableau ci-après fait état de facteurs évoqués par trois auteurs.

Table N°3. Les facteurs de localisation des entreprises selon les trois auteurs

R.Hayter (1998)	P.Aydalot (1985)	B.Merenne-Schoumaker (2008)
• Les matières premières ; • les marchés et les transports ; • La main-d'œuvre ; • Les économies d'échelles externes ; • L'énergie ; • Les équipements publics et les aménités locales ; • Les capitaux ; • Le pays ; • L'environnement ; • Le gouvernement.	• Les coûts de transport et la proximité des inputs ; • Le travail ; • La proximité des marchés ; • L'existence d'un milieu industriel ; • L'organisation des contacts internes à l'entreprise ; • Les terrains et les bâtiments ; • L'infrastructure ; • Le marché financier ; • Les facteurs personnels (histoire individuelle de chaque entreprise et de chaque branche, aménités locales) ; • La fiscalité locale ; • l'attitude des populations vis-à-vis de l'entreprise ; • Les aides publiques.	• La situation géographique ; • Le marché ; • Les avantages comparatifs ; • La politique des pouvoirs publics ; • Les matières premières, l'eau et l'énergie ; • Les transports ; • Les disponibilités en terrains et en bâtiments ; • Les aspects quantitatifs et qualitatifs de la main-d'œuvre ; • L'environnement économique ; • Les préoccupations et les contraintes de l'environnement ; • Le cadre de vie ; • L'intervention des pouvoirs publics.

Source : établi par les doctorants à partir de références citées ci-dessus.

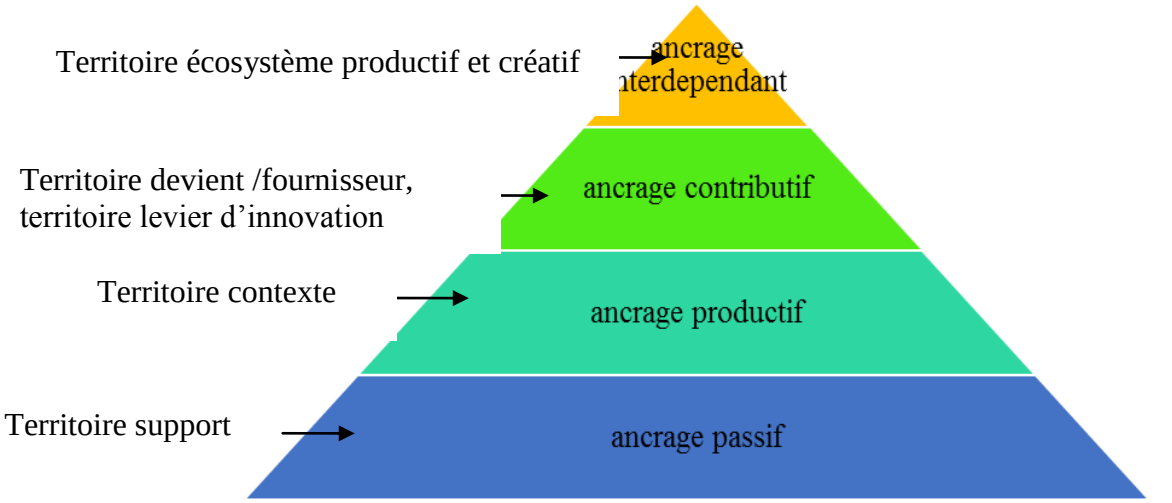
3.5 La territorialisation des entreprises :

La territorialisation des entreprises est le corollaire de la diversité des trajectoires socio-économiques des territoires sur lesquels elles sont implantées (Colletis et Pecqueur, 2005). Il s'agit d'une « rencontre productive » entendue comme « une configuration de rencontre entre une entreprise caractérisée par une stratégie et/ou des besoins particuliers et une dynamique territoriale spécifique (Colletis et Pecqueur, 1993) » (Colletis & Pecqueur, 2005).

3.6 Scénario de l'ancrage territorial des entreprises :

- Ancrage passif : Le territoire est un support pour l'activité de l'entreprise qui ne cherche pas à développer son ancrage local au-delà des nécessités du Licence to operate.
- Ancrage productif : L'entreprise analyse son environnement pour consolider le Licence to operate et adapter son offre aux besoins locaux. Ses actions visent à rendre plus performant son « outil de production ». Dans un environnement qu'elle juge plus contraint, elle travaille son image et sa réputation pour entretenir la confiance.
- Ancrage contributif : L'entreprise a besoin de développer / renforcer son ancrage local pour développer sa performance économique. Elle engage des processus d'apprentissages collectifs et de co-construction qui l'amènent à contribuer au développement du territoire dans une logique gagnant/gagnant.
- Ancrage interdépendant : Le territoire est devenu pour l'entreprise un espace de projets avec les autres acteurs de l'écosystème local. Elle en retire une démultiplication de sa capacité d'innovation et un renforcement de sa capacité à adresser ses marchés.

Figure N°1 : Scénario de l'ancrage territorial des entreprises



Source :(OREE, 2012)

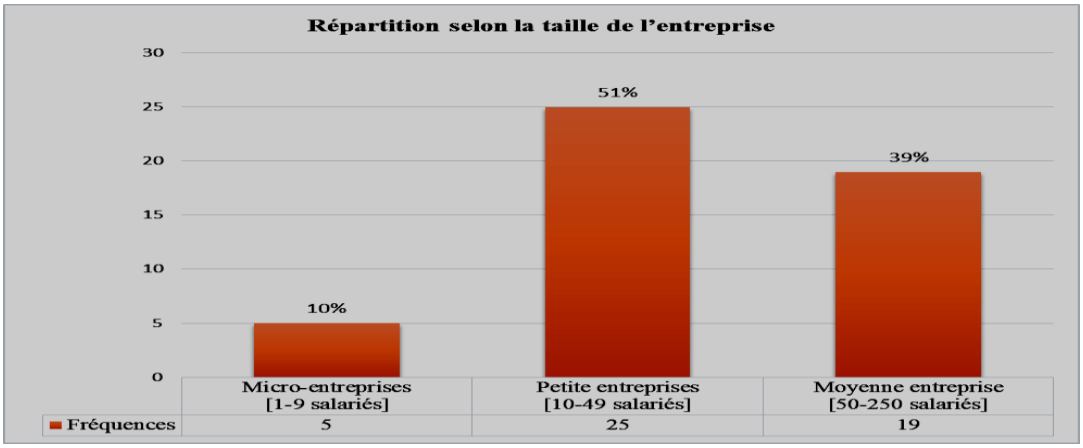
4. Quels facteurs de localisation des entreprises oranaises ?

L'objectif de notre enquête est d'accumuler le plus d'observations possible afin de déterminer les facteurs qui influencent le choix de la localisation des entreprises à Oran. La population ciblée est celle des entreprises activant à Oran au niveau des zones industrielles et des zones d'activités. Notre échantillon objet de l'enquête de terrain est constitué de 49 entreprises.

3.1. Caractéristiques des entreprises enquêtées

Notre échantillon est constitué à 61% de petites entreprises et très petites et à 39% d'entreprises moyennes. La tendance en Algérie est à la création d'entreprises de petite taille plus facile à créer étant donné tous les dispositifs mis en place par les pouvoirs publics pour encourager ce type d'initiative chez les jeunes (voir figure2).

Figure N°2. Répartition de l'échantillon retenu selon la taille de l'entreprise

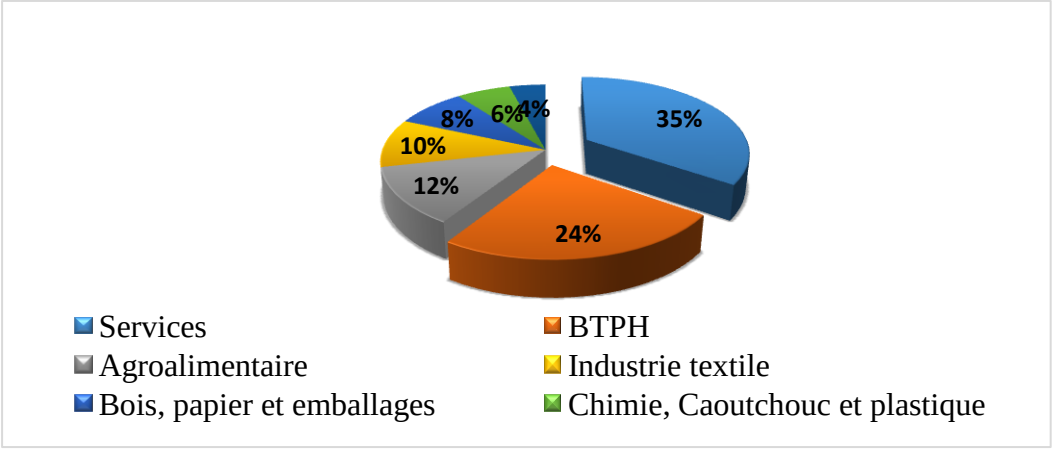


Source : Nos résultats à partir de l'enquête du terrain.

On déduit par ailleurs, que notre échantillon d'entreprises activent dans sept (7) branches d'activité :

- dix-sept (17) entreprises enquêtées opèrent dans le secteur des services. Elles représentent 35% de notre l'échantillon,
- douze (12) entreprises opèrent dans le secteur du BTP (25%)
- les reste de l'échantillon soit les 40% des entreprises sont repartis sur les 5 secteurs d'activité comme le la figure ci-dessous :

Figure N°3. Répartition de l'échantillon par secteur d'activité

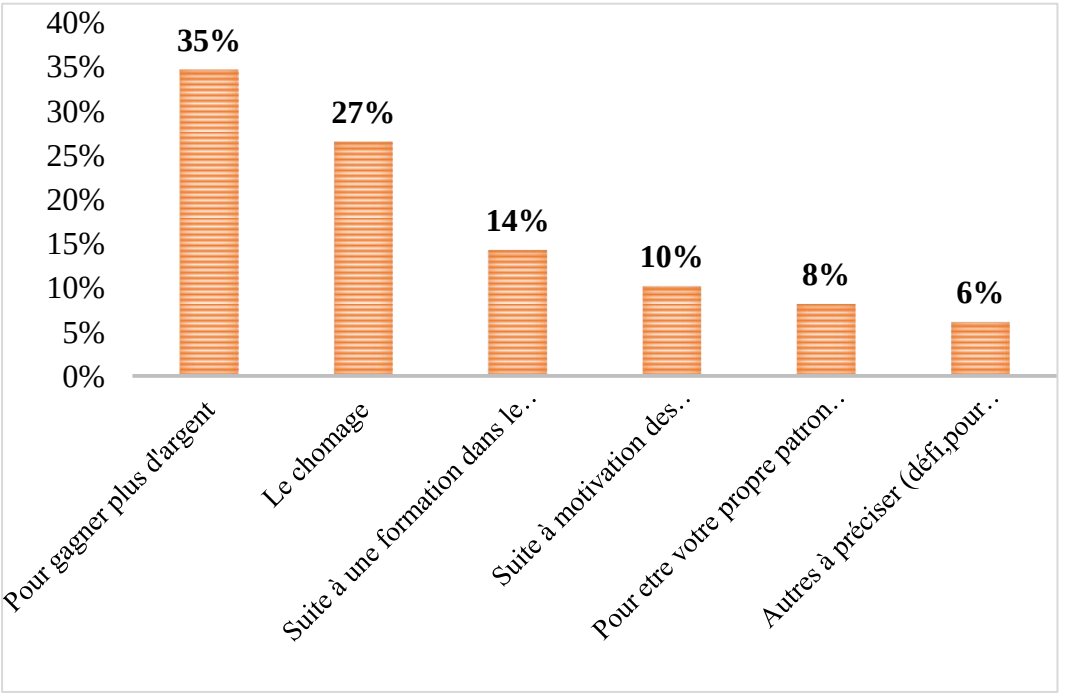


Source: Nos résultats à partir de l'enquête du terrain

3.2. Les modalités de la création de l'entreprise :

L'objet de ce paragraphe est de déterminer les motifs de création des entreprises et les difficultés rencontrées dans ce processus.

Figure N°4. Motifs de la création



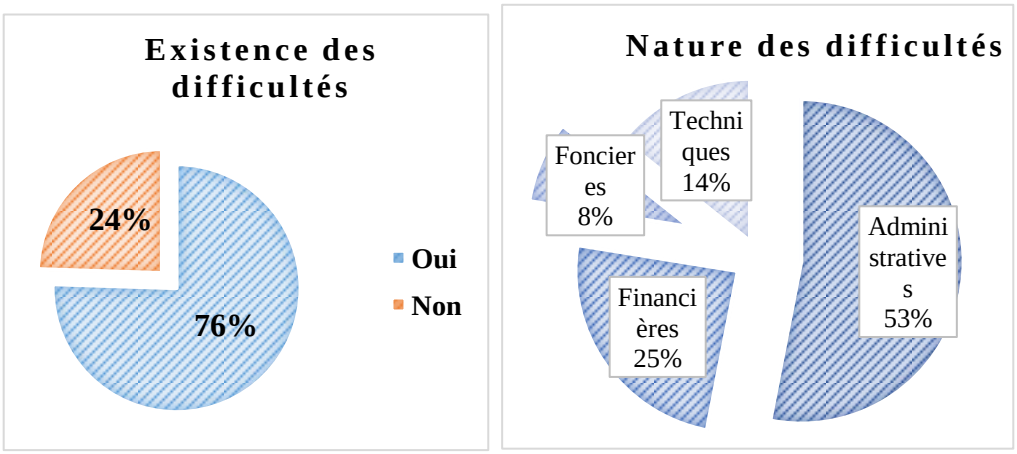
Source: Nos résultats à partir de l'enquête du terrain

Concernant les motifs de création des entreprises, la principale raison d'être entrepreneur d'après les réponses obtenues, c'est de gagner plus d'argent avec un taux de réponse de 35%. Il ressort aussi que 27% des répondants étaient au chômage et 8% d'entre eux justifient leur choix par l'envie d'obtenir leur propre emploi.

Enfin, les chefs d'entreprise ont créés leur affaire en premier pour augmenter leurs revenus et gagner plus d'argent afin d'améliorer leurs niveau de vie, ensuite pour n'être plus au chômage et gagner en indépendance.

La majorité des répondants ont par ailleurs, avancé les difficultés rencontrées dans la création de leurs entreprises (76%)

Figure N°5. Les difficultés de la création des entreprises



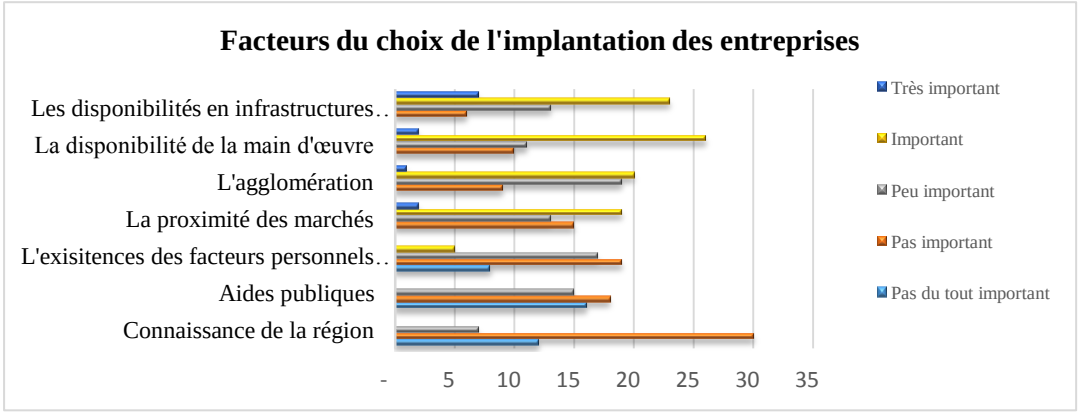
Source : Nos résultats à partir de l'enquête du terrain

A la lumière des réponses obtenues, 53% des répondants affirment que les difficultés majeures rencontrées au moment de la création sont des contraintes administratives, suivies de contraintes de financement (25%). ,

3.3. Discussion des facteurs du choix de l'implantation des entreprises

Afin de vérifier les hypothèses que nous avons avancées plus haut, nous allons analyser les réponses relatives au choix de facteurs territoriaux de localisation par les entreprises enquêtées. Le graphique suivant illustre ces réponses:

Figure N°6. Facteurs du choix de l'implantation des entreprises



Source : Nos résultats à partir de l'enquête du terrain

- La disponibilité de ressources et d'infrastructures comme un facteur majeur de localisation :

Il ressort que 62% des entreprises affirment que la disponibilité de ressources et d'infrastructures est considérée comme un facteur clé du choix de la localisation.

L'existence d'un réseau d'infrastructures de bases, tels que les réseaux routiers, ferroviaires, les aéroports, les ports …etc. peuvent minimiser le coût du transport des biens, induisant par conséquent une baisse des coûts de production. A ce titre, le territoire de la Wilaya d'Oran dispose d'importantes potentialités en termes des ressources et d'infrastructures.

Il possède d'un réseau routier très important constitué de 187 km des routes nationales, 592 km des chemins de wilaya, 274 km des chemins communaux et d'un réseau ferroviaire d'une longueur de 96 km qui contient trois gare (Oran, Es-Senia et Oued Tlelat par lesquelles transitent 2 millions de voyageurs/ an et 3 millions de tonnes des marchandises/ an).

Aussi, Oran dispose d'un réseau portuaire comptant trois ports (Oran classé deuxième port commercial du pays, Arzew classé premier port pétrolier du pays et Bethioua), en plus d'un aéroport de classe international d'une capacité de 3 millions de voyageurs/ an. (DPAT, 2013)

Par ailleurs, on dénombre cinq zones industrielles et plus de vingt zones d'activités d'une superficie totale de 3750 Ha, auxquelles, on ajoute la zone industrielle de 250 Ha où est implantée l'usine de production d'automobile en partenariat avec la société Renault (ANIREFF, 2016)

- L'accès à la main d'ouvres qualifiée est un facteur déterminant dans le choix d'implantation :

La disponibilité de la main d'œuvre est facteur important classé dans la deuxième position, par plus de la moitié des répondants (57%). En effet, les entreprises cherchent les territoires peuplés où la main d'œuvre disponible peut être à la fois moins chère et qualifiée. A ce sujet, la population oranaise s'établit à 1 577 556 habitants, soit une densité de 746 h/km², avec un taux d'accroissement annuel moyen de 2,45% depuis 2008. (RGPH, 2008)

De notre enquête, on déduit que les entreprises interrogées emploient une main d'œuvre assez qualifiée disposant en général de diplômes universitaires (Master, licence, ingénieurs et techniciens). Le territoire oranais est en effet, un pôle universitaire par excellence disposant de trois universités (Universités Oran 1, Oran 2 et l'USTO) et de plusieurs écoles nationales (ENPO, écoles des télécommunications….).

- Les effets de l'agglomération économique et urbaine sur la localisation des entreprises :

En troisième position, on trouve l'agglomération économique et urbaine, ce facteur à un effet sur la décision de localisation des entreprises. A ce sujet, la répartition spatiale des entreprises oranaises selon la daïra d'implantation nous montre la concentration des entreprises dans les agglomérations urbaines à forte densité de population soit plus de 72% des entreprises sont installées dans deux daïra, à savoir Oran et Es-Senia. (DIPME, 2010)
Cela montre, que la localisation des entreprises est fortement et positivement corrélée avec la densité de la population.

5. Conclusion

L'objectif de cet article, était de répondre à la question de savoir «quels sont les déterminants de la localisation des entreprises au sein du territoire Oranais ?». A la lumière des résultats obtenus, la localisation des entreprises enquêtées dépend aussi bien de facteurs traditionnels (disponibilité des ressources, de la main d'œuvre qualifiée, d'infrastructures de base…), que de facteurs que nous qualifierons invisibles, telles que les logiques familiales. Sur ce dernier point, les entretiens réalisés auprès des chefs entreprises enquêtées ont révélé que leurs responsabilités familiales sont une contrainte à leur mobilité professionnelle, résultat confirmé par les travaux de (Boutillier, 2005).

Au terme de ce travail, nous pouvons avancer que le territoire oranais est très attractif pour les investissements et la création des entreprises car possédant d'importantes potentialités en termes de ressources, d'infrastructure set du capital humain.

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La Stratégie de Financement non Conventionnel et son Impact Socio-économique en Algérie

The Unconventional Financing Strategy and its Socio-Economic Impact in Algeria

Safia ZOURDANI
Université Mouloud MAMMERI de Tizi-Ouzou, Algérie
safiazourdani@hotmail.fr

Received: 14/09/2018 **Accepted:** 01/01/2019 **Published:** 23/01/2019

Résumé

L'objectif de cet article est l'analyse de la stratégie adoptée par les autorités algériennes suite à la mise en place du financement non conventionnel au profit du Trésor public et ce, pour pallier au manque de liquidité dans un contexte de crise financière, induite par la chute du prix des hydrocarbures en 2014 où le recours à l'endettement extérieur était écarté.

A partir des résultats obtenus, nous avons déduit que ce nouveau modèle de croissance à travers l'amendement de la loi sur la monnaie et le crédit (***17-10 du 11/10/2017***), évitera l'arrêt du processus de développement économique et social. Cependant, plusieurs défis doivent être relevés et qui consistent à la stimulation de la concurrence entre les entreprises avec un rôle accru du secteur privé pour stimuler la croissance économique.

Mots clés: crise financière, financement non conventionnel, réformes socio-économiques, planche à billets, banque centrale.
Classification JEL: H61, H62, H68

Abstract

The objective of this article is the analysis of the strategy adopted by the Algerian authorities following the introduction of unconventional lack

Auteur correspondant: Safia ZOURDANI, **Email:** safiazourdani@hotmail.fr.

of liquidity in a context of financial crisis, induced by the fall in the price of hydrocarbons in 2014 when the use of external debt was ruled out.

From the results obtained, we have deduced that this new growth model through the amendment of the law on money and credit (17-10 of 11/10/2017), will avoid stopping the economic development process and social. However, there are several challenges that need to be addressed, which include stimulating competition among businesses with an increased role for the private sector to stimulate economic growth.
Keywords: financial crisis, unconventional financing, socio-economic reforms, printing press, central bank.
JEL Classification: H61, H62, H68.

1. INTRODUCTION

La situation économique et sociale de l'Algérie est marquée ces dernières années, essentiellement par l'épuisement des fonds de régulation des recettes (FRR) et le recul drastique des réserves de change de 200 milliards de $ US en 2014 pour s'établir à 96 milliard $ US en 2017. (MOUHOUBI, 2009), atteste que certes, des efforts considérables ont été déployés par les pouvoirs publics, notamment la réconciliation nationale depuis 1999 pour apaiser les tensions sociales, nées de la décennie noire et l'effacement de la dette extérieure du pays évaluée à 4,5 milliard $ US. Néanmoins, le même scénario se reproduit suite à la crise financière déclenchée à cause de la chute du prix de pétrole il ya quatre ans. Devant une telle situation, des solutions urgentes doivent être proposées pour y remédier[1]. Le recours au financement non conventionnel est à la page dans le plan d'action du gouvernement algérien. Bien que, le niveau de la masse monétaire en circulation est très élevé, le taux de chômage avoisine les 11,7% et le taux d'inflation s'est établi à environ 5,6% en 2017.

L'Algérie est confrontée à des défis de taille en raison du ralentissement de son activité économique (ONS, 2016), impactant ainsi l'activité sociale. Le gouvernement algérien a déclaré le motif du recours à ce mode de financement et qui n'est pas une émanation du hasard. La première raison est expliquée par le faite que les avoirs du Fonds de

régulations des recettes qui ont culminé à plus de 5 000 milliards DA en 2012 ont été épuisés au début de l'année 2014 suite aux déficits budgétaires successifs. L'autre raison évoquée est liée au marché financier local qui n'est pas de taille à permettre au Trésor de s'y endetter d'autant plus que les banques de la place se retrouvent elles mêmes confrontées à une raréfaction des liquidités, ce qui ralentit le financement des projets d'investissements, même lorsqu'ils sont rentables.

Les autorités algériennes se voient donc, contrainte de recourir au financement non conventionnel étant donné que le recours à l'endettement extérieur est strictement prohibé par le président de la république et ce, pour éviter au pays d'être pris dans la spirale des emprunts à l'extérieur. En calquant le modèle importé des pays développés suite à la crise des subprimes de 2008, le gouvernement fait recours au financement non conventionnel où, l'opportunité sera offerte sur une durée maximale de cinq ans pour le Trésor Public de s'endetter pour financer le déficit budgétaire qui sera accompagné d'un ensemble de reformes économiques et financières permettant de rétablir l'équilibre.

Ainsi, des efforts importants sont déployés pour mobiliser davantage de recettes hors hydrocarbures, à améliorer l'efficience et la gestion des dépenses publiques, ainsi qu'à élargir les réformes des subventions tout en protégeant les populations pauvres et encourager le développement du secteur privé et en améliorant le climat des affaires, en facilitant l'accès au crédit, ainsi qu'en renforçant la gouvernance, la transparence et la concurrence. Les autorités estiment également utile d'agir pour réduire l'inadéquation des qualifications, améliorer le fonctionnement du marché du travail, accroître le taux d'activité des femmes et continuer d'ouvrir l'économie au commerce extérieur et à l'investissement direct étranger (IDE).

1.1. La problématique

Devant plusieurs avis contradictoires exprimant une réalité qui renseigne sur l'ampleur de la crise économique, financière et sociale en Algérie, on trouve l'opinion, qui est pour se type de financement pour des raisons de protection de l'économie et la sauvegarde de la stabilité

financière du pays pour éviter le recours au FMI suite à la mauvaise expérience de l'ajustement structurel. D'autres, estiment que ce mode de financement n'est pas bon pour le citoyen qui se débat dans une précarité sociale insoutenable car le pouvoir d'achat de la majorité des algériens va s'éroder de façon exponentielle et il poussera beaucoup d'entres eux vers une pauvreté intenable. En effet, même si les grands pays tels que le Japon, les USA, la Grande Bretagne l'ont adopté, ils peuvent se prémunir des risques qui découlent en raison de leurs forte monnaie et de la possession d'une monnaie alternative qui permet de parer à ce genre de risque économique et financier.

Notre intérêt est de chercher dans le contexte algérien des éléments de réponse à la question suivante ***: en quoi consistent les réformes socio-économiques adoptées par l'Algérie suite à la stratégie de financement non conventionnel?***

1.2. L'objet de l'étude

Il porte essentiellement sur les nouveautés apportées par la loi sur la monnaie et le crédit n° 17-10 du 11/10/2017 (loi relative à la monnaie et au crédit, 2017), la reprise des principaux indicateurs socio-économiques de l'Algérie sur la période 2010-2018 et l'exploration des nouvelles politiques adoptées sur cinq ans, durée du recours au financement non conventionnel.

1.3. La démarche méthodologique

Notre étude est un mélange de littérature sur la question du financement non conventionnel et d'une étude empirique basée sur l'analyse des données recueillies au niveau de l'office national des statistiques (ONS), la Banque Mondiale (BM) et le Fonds Monétaire International (FMI).

1.4. Structure de l'étude

Nous allons dans un premier temps, faire une revue de littérature sur le financement non conventionnel, reprendre ses origines et sa définition. Dans un deuxième temps, on présenterons l'évolution économique et sociale avant et après juin 2014, période qui a connu la chute drastique du prix du pétrole de 110 dollar US à 35 dollars US et enfin, retracer l'apport de la loi n° 17-10 du 11/10/2017 sur les réformes engagées pour réaliser le

développement socio-économique du pays.

2. Revue de la littérature sur le financement non conventionnel

Selon les Anglo-Saxons, « the Dutsch Disease», c'est le syndrome hollandais qui a touché l'Algérie dés les années 1970, autrement dit, en s'appuyant uniquement sur les hydrocarbures même si il y'a eu la volonté de construire des usines pour encourager les produits manufacturiers. Devenue ainsi, une société de consommation en 1986, l'année qui a connu le contre choc pétrolier qui a amené l'Algérie vers un programme d'ajustement structurel (PAS) et qui prônait l'ouverture de l'économie nationale. L'année 2000 a connu une hausse du prix du baril passant de 40 dollars US à 140 dollars US et la situation financière s'est nettement améliorée. Le pays reste dépendant aux recettes pétrolières, un fonds de régulation des recettes est crée pour faire face à d'éventuels situation de crises.

La conséquence directe du financement non conventionnel est l'augmentation de l'inflation à cause d'un apport important de liquidité. Les pays en développement subissent directement se phénomène qui se répercute sur le pouvoir d'achat des ménages. (IRR, 2014), les autorités algériennes en adoptant cette démarche veulent éviter le recours au financement extérieur. L'expérience du PAS est toujours d'actualité en Algérie avec les conséquences du chômage que l'on connait sur la population.

2.1. La définition du financement non conventionnel

Les mesures non conventionnelles peuvent prendre des formes différentes, en fonction des priorités définies par les banques centrales[2] (la stabilisation des marchés financiers, la relance du crédit, la lutte contre la déflation), et aussi selon les caractéristiques des systèmes financiers (si le financement de l'économie s'effectue plutôt par les marchés financiers ou par les banques commerciales (ABC de l'économie, 2017).

(MEDDAH, 2017), expert financier et directeur général du cabinet RMG Consulting, une société de services financiers et de conseil aux entreprises, explique que « *le financement non conventionnel est un financement qui se fera directement entre la Banque d'Algérie et le Trésor*

public via des prêts, des avances et de l'endettement. Nous sommes en train de basculer du FRR qui est une épargne chargée de compenser le déficit du trésor vers la Banque d'Algérie qui va le compenser par l'émission monétaire ». Pour rappel, le mode de financement non conventionnel est une théorie néo-keynésienne (KHEFFACHE, 2017) qui anticipe sur l'accroissement de la demande à terme (investissement et consommation) mais il accélère le processus inflationniste en cas de rigidités structurelles et de non dynamisation du tissu productif. Raison pour laquelle le gouvernement a prévu des réformes[3].

2.2. La définition de la planche à billet

« *Il s'agit pour une banque centrale à créer de la monnaie en procédant à des achats massifs d'actifs financiers (notamment des obligations d'Etat). L'objectif recherché étant d'injecter des liquidités importantes dans l'économie de façon à stimuler l'activité et la croissance économique et à redresser le taux d'inflation pour éviter que l'économie ne tombe en déflation*» (GAUVIN, 2013).

2.3. Les mesures non conventionnelles des politiques monétaires

En effet, dans le cas de dysfonctionnements des canaux de transmission des politiques monétaires d'un Etat donné, on peut distinguer trois grandes catégories de mesures non conventionnelles, susceptibles d'être combinées. Ces mesures visent respectivement à augmenter massivement la quantité de monnaie en circulation dans l'économie. On parle alors de «*quantitative Easing* » ou encore (assouplissement quantitatif, (CLERC, 2009), à agir sur la pente de la courbe des taux en s'engageant sur la trajectoire future des taux directeurs de façon à orienter les anticipations des agents et à débloquer les marchés de crédit en achetant directement des titres sur ces marchés afin de peser sur les primes de risque. On parle dans ce cas de « *crédit Easing* » ou bien, (assouplissement des conditions de crédit).

Tableau 1. Mesures non conventionnelles des politiques monétaires

Objectifs et Mesures → / ↓	Achats de titres Publics	Achats de titres Privés	Engagements à maintenir les taux
augmenter la quantité de monnaie dans l'économie	OUI	OUI si pas de stérilisation	NON
agir sur les anticipations d'inflation et la courbe des taux d'intérêt	OUI	OUI à travers les primes de risque	OUI
débloquer les marchés du crédit	NON	OUI	NON

Source : (AIT CHEIKH & FETTAHI, 2017).

Ce rapide panorama des mesures non conventionnelles et de leurs utilisations met en évidence la variété des instruments dont disposent les banques centrales pour conduire leurs politiques monétaires (NABOUSSI, 2018). Même lorsqu'elles ont déjà fortement réduit leurs taux d'intérêts directeurs et même lorsque les marchés ne fonctionnent plus ou que l'intermédiation bancaire se bloque, elles ont encore de puissants moyens d'actions pour influencer le coût de financement de l'économie.

Tableau 2. Principales mesures non conventionnelles prises par la FED et la BCE

Mesures non conventionnelles	FED	BCE
Taux directeur	entre septembre 2007 et décembre 2008, le taux des fonds fédéraux est ramené de 5,25% à une fourchette comprise entre 0 et 0,25%. En Janvier 2012, Ben Bernanke annonce que ce taux restera à ce niveau tant que le taux de chômage ne sera pas revenu aux environ	Après le relèvement de juillet 2008 à 4,75%, le principal taux de la BCE baisse de manière progressive jusqu'à 0,75% en juillet 2012 pour faire face aux risques déflationnistes, à la faible dynamique de l'activité économique et à la persistance de la contraction du crédit.

	de 6,5%.	
Facilité de refinancement	Pour faciliter le refinancement à court terme des banques et réduire les pressions à la hausse sur les taux d'intérêt qu'elles doivent payer, la FED a instauré le *Term Auction Crédit Facility* (*TAF*). Ainsi, elle a conclu des accords de swaps en dollars avec 14 banques centrales étrangères.	La BCE accroît le nombre et la taille de ses opérations de refinancement bancaire à long terme. En décembre 2011 et février 2012, la BCE refinance les banques à 3 ans. En deux temps, 489 milliards d'euros, et puis 529 milliards ont été injectés au total dans le système.
Octroi de liquidité	Mise en place d'un second dispositif destiné à procurer de la monnaie banque centrale directement aux investisseurs et aux émetteurs des principaux marchés financiers. Les bénéficiaires apportent au guichet de la FED des papiers commerciaux, des créances titrisées (crédits automobile, crédits étudiant…).	dés octobre 2008, les banques peuvent ainsi obtenir toutes les liquidités dont elles ont besoin.
Opérations de marché	Le troisième dispositif consiste en des achats de titres sur les marchés « *quantitative Easing* » (QE). Pour abaisser durablement les taux d'intérêt à long terme, la FED achète les titres du Trésor américain. Elle monétise ainsi la dette fédérale américaine.	Depuis juillet 2013, la BCE s'orienter vers une politique dite de "***Forward Guidance***" qui consiste à annoncer et à s'engager sur la trajectoire future du taux directeur. Par cet intermédiaire, la BCE souhaite accroître la transparence de son action.
Fin du programme	2014, avec comme conséquence gonflement du bilan de la banque centrale à l'actif qui s'élève à 4.509 contre 877 en 2006.	2014, avec comme conséquence gonflement du bilan de la banque centrale à l'actif qui s'élève à 2.600 contre 1.000 en 2007.

Source : (AIT CHEIKH & FETTAHI, 2017).

Au niveau des politiques non conventionnelles, on constate que les

mesures menées par les deux Banques Centrales sont différentes, (RIPERT, 2012). Cela, peut s'expliquer par le fait que les objectifs poursuivis n'étaient pas les mêmes, par la différence entre le cadre opérationnel des deux Banques Centrales, (KANGA, 2017), mais aussi, par les spécificités de financement externe des deux économies. Nous allons voir pour l'Algérie, les principaux indicateurs macro économiques pour la période de 2014 à 2023.

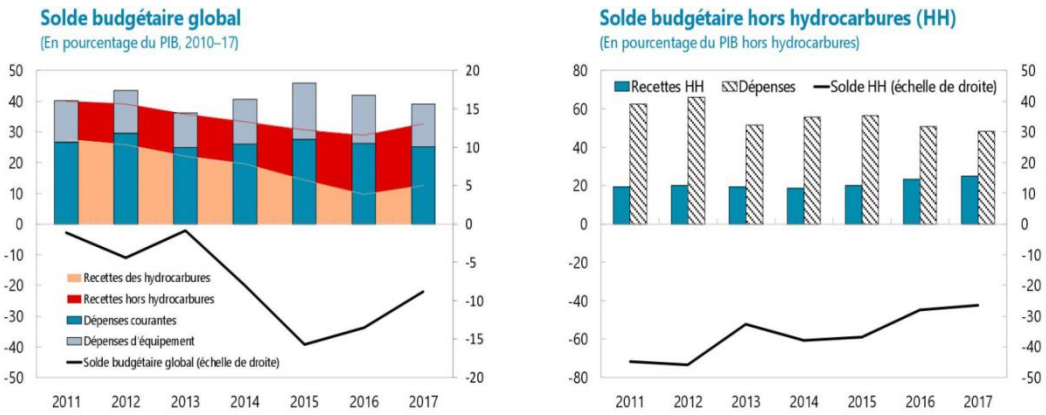
3. Analyse des principaux indicateurs macro économiques en Algérie 2014-2023

Le rapport de suivi de la situation économique de l'Algérie permet de faire le point sur les principales évolutions et politiques économiques. Ce rapport présente également les conclusions des travaux récents de la Banque mondiale en Algérie ainsi que celle du FMI. Ils les inscrivent dans une perspective à long terme dans le contexte international mais également du point de vue pays, (Decret exécutif, 2018) et évalue les implications de ces mutations ainsi que celles d'autres changements affectant les politiques publiques.

Son spectre va de la dimension macroéconomique aux indicateurs de bien-être et de développement humain, en passant par les marchés financiers. Il est destiné à un large public notamment, aux décideurs politiques, aux chefs d'entreprises, à la communauté des analystes et des professionnels intervenants en Algérie et aux participants aux marchés financiers, (BM, 2017).

Selon (KOUDRI, 2012) : « *dans un contexte de crise financière internationale, il apparaît nécessaire de s'interroger sur l'avenir du marché financier en Algérie dans la mesure où la contrainte financière est souvent avancée lors de la création et de la croissance des entreprises, conditions objectives du développement économique. Les nombreuses études tendent à prouver que ce dernier a besoin d'un marché financier actif et organisé ainsi que d'un marché bancaire fiable et crédible* ». En effet, nous allons essayer de présenter les principaux indicateurs socio-économiques de l'Algérie en raison de faire une succincte analyse:

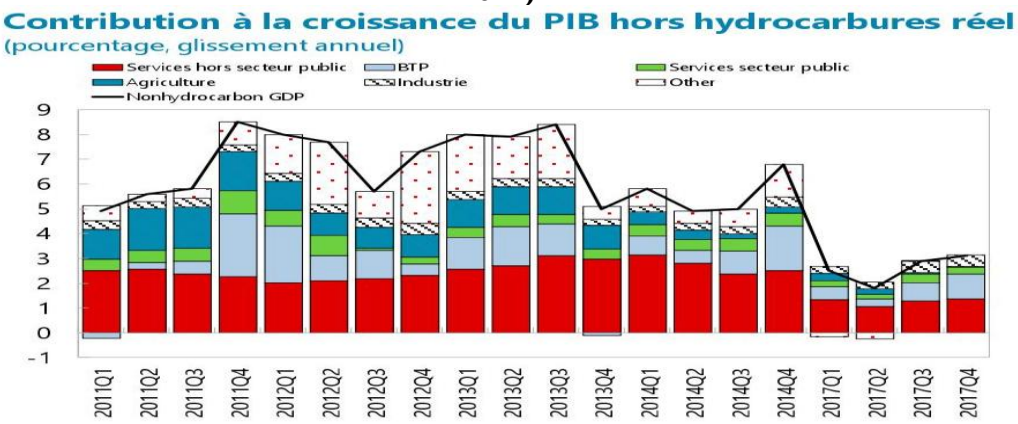
Graphique 1. Évolution du solde budgétaire de l'Algérie (2011-2017)



Source *:* (FMI, 2018, p. 14).

Un maigre ajustement budgétaire a été réalisé (FMI, 2018). Selon les estimations, le déficit hors hydrocarbures a diminué de moins de 2% du PIB hors hydrocarbures pour s'établir à 26,4% du PIB. Les dépenses globales ont été réduites de 1,3%. L'Etat a prouvé des difficultés de financement suite à l'épuisement, en début d'année 2014, de l'épargne placée dans le fonds de régulation des recettes pétrolières (FRR). L'Etat a fait recours depuis novembre à l'emprunt auprès de la banque centrale pour financer son déficit, ce qu'il a fait c'est 3% du PIB et 8,6% comme rachat des créances des entreprises publiques et le financement du fonds national d'investissement (FNI).

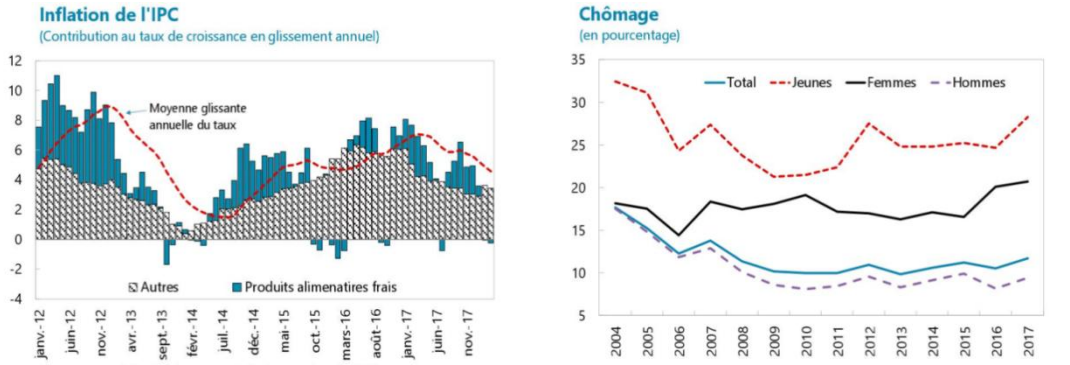
Graphique 2. Croissance du PIB hors hydrocarbures réel en l'Algérie (2011-2017)



Source : (FMI, 2018, p. 08).

La croissance du PIB réel a ralenti. La baisse de la demande Européenne de gaz et le quota de l'OPEP ont engendré une baisse de la production d'hydrocarbure (-3%). Le taux de croissance atteint 1,6% contre 3,3% en 2016.

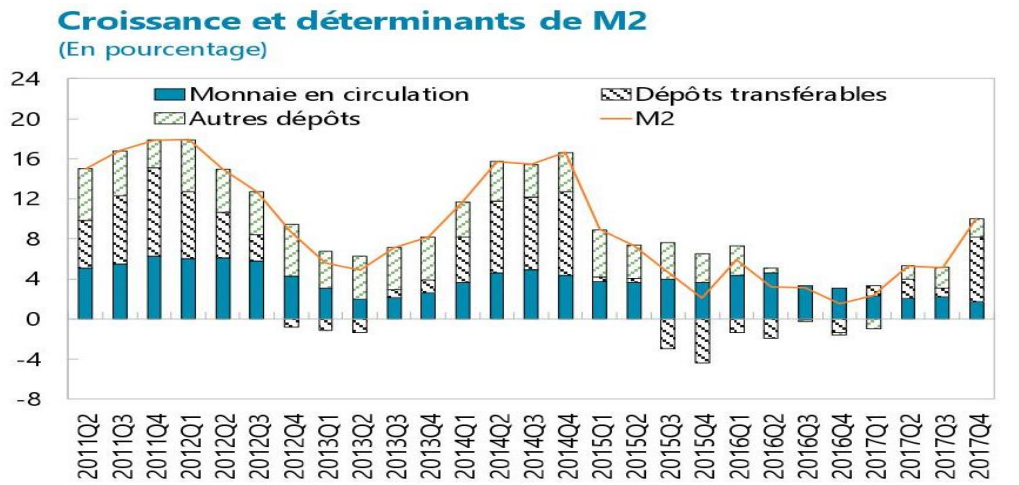
Graphique 3. Évolution du taux d'inflation et taux de chômage, l'Algérie (2011-2017)



Source : (FMI, 2018, p. 08).

Le taux de chômage était passé de 10,5% en 2016 à 12,3% en avril 2017 puis baisse légèrement à 11,7% en septembre 2017. Il est élevé chez les jeunes (28,3%) et chez les femmes (20,7%). Pour l'inflation il s'établi à 5,6% en 2017 contre 6,4% en 2016 et dépasse l'objectif de la banque d'Algérie qui est de l'ordre de (4%).

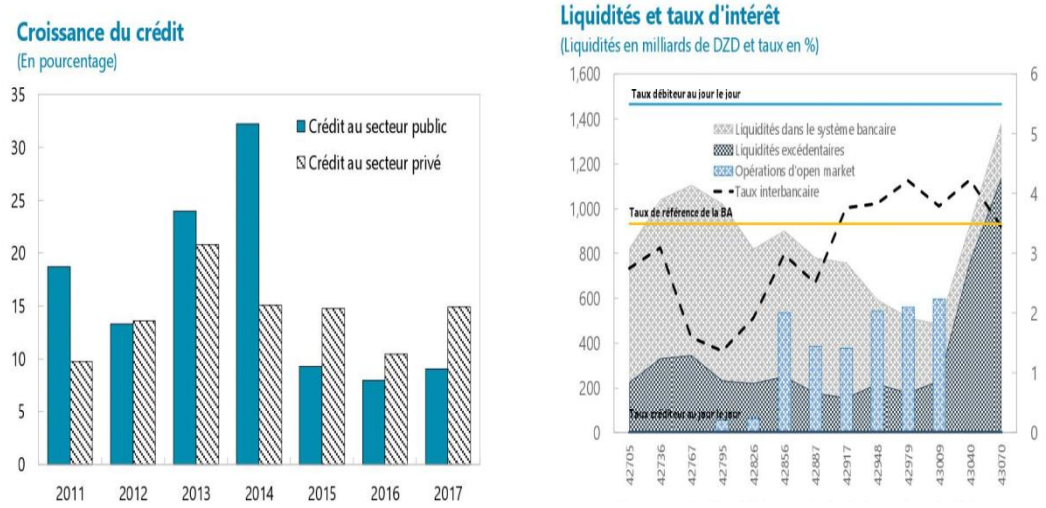
Graphique 4. Croissance et déterminant du M2 en l'Algérie (2011-2017)



Source : (FMI, 2018, p. 10).

La croissance de la monnaie a connu un ralentissement en 2016 pour cause principale de la baisse des dépôts bancaires en dépit de la baisse des réserves obligatoires. Cette baisse est expliquée essentiellement, par la baisse de niveau des dépôts à vue au sein des banques commerciales et le trésor et qui résulte de la baisse des dépôts des secteurs hors hydrocarbure à savoir ceux des entreprises publiques. La croissance de la monnaie s'est accélérée en 2017, en raison d'une forte croissance des dépôts. Cette augmentation est justifiée par une évolution de la circulation fiduciaire et des dépôts auprès des CCP, (BOUAKEL & LABIAD, 2018).

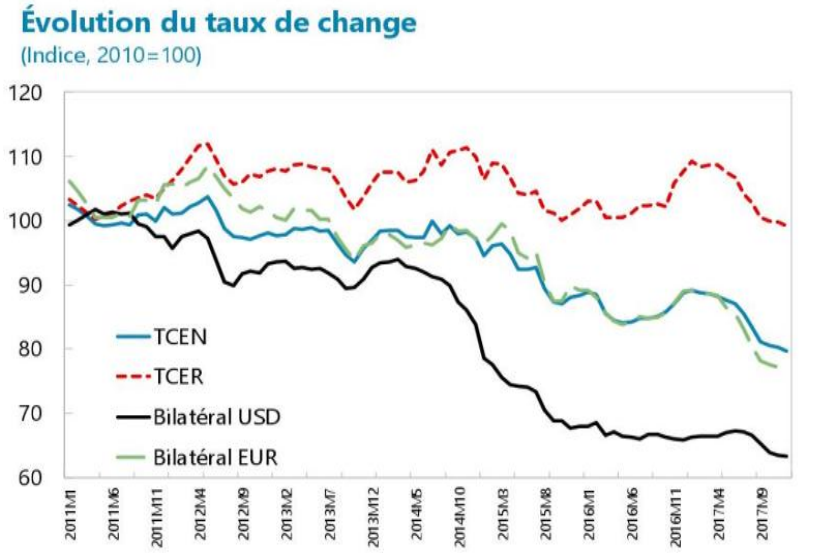
Graphique 5. Croissance du crédit, liquidités et taux d'intérêts, Algérie (2011-2017)



Source : (FMI, 2018, p. 10).

La croissance du crédit à l'économie s'explique par les importantes injections des liquidités dans les systèmes bancaires réalisés à partir des tirages sur les (FRR), par les opérations de refinancement auprés de la banque d'Algérie, et par l'abaissement des réserves obligatoires (de 8% à 4%). Le durcissement des conditions de liquidité a entrainé la hausse des taux d'interets sur le marché interbancaire.

Graphique 6. Évolution du taux de change en Algérie (2011-2017)



e taux de ıange effectif ominal et le ıux de change ffectif réel se ont dépréciés ı 2017.

Source : (FMI, 2018, p. 10).

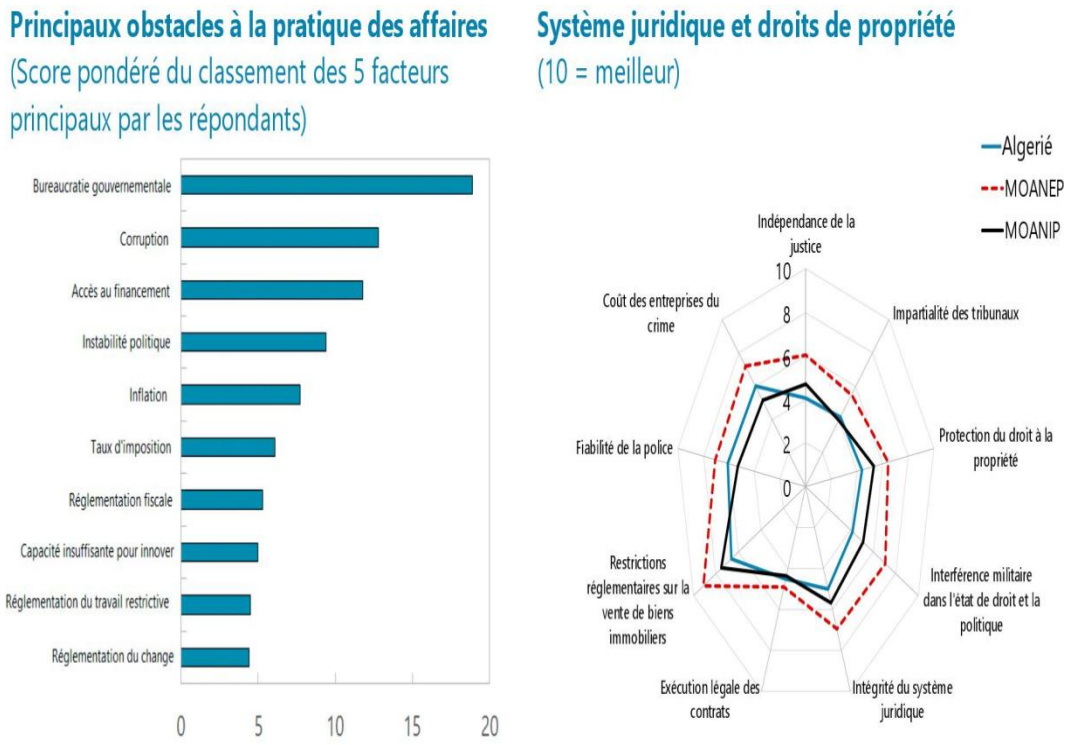
4. Réformes pour une croissance durable et inclusive

Il est crucial de mettre en place des réformes structurelles pour refondre le modèle de croissance du pays à travers la diversification de l'économie et l'encouragement de l'investissement dans le secteur privé qui connait jusqu'ici beaucoup de blocages. Il est nécessaire de dresser un calendrier sur la base duquel les réformes seront classées par priorités et exécutées au fur et à mesure pour aboutir aux résultats escomptés. La mise en place des réformes doit être équitable et externalisée toutes formes d'inégalités comme suit :

4.1. Renforcement de la gouvernance, la transparence et réduction du formalisme administratif

Nous allons voir à travers le graphe suivant les principaux problèmes rencontrés à la pratique des affaires et l'atteinte du système juridique :

Graphique 7. Principaux obstacles à la pratique des affaires en Algérie



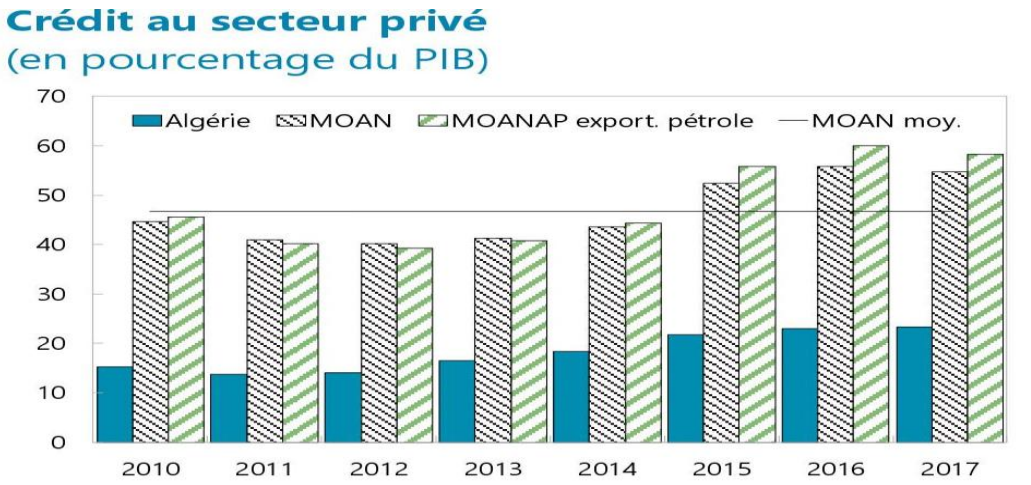
Source : (FMI, 2018, p. 21).

En Algérie, le secteur privé connait plusieurs entraves, parmi elles, nous avons la corruption. Pour les administrations qui protègent le droit de propriété et le droit des contrats ont un manque flagrant de capacités, et ce, peut être justifié par la réticence d'informations publiées pour les indicateurs budgétaires et autres. La priorité de l'Etat, c'est de s'attaquer à ces questions en vue de rétablir la confiance entre les citoyens et les institutions par l'application stricte de la réglementation.

4.2. L'amélioration de l'accès au financement

Le secteur privé doit avoir une intention particulière.

Graphique 8. Évolution des crédits au secteur privé en Algérie (2010-2017)



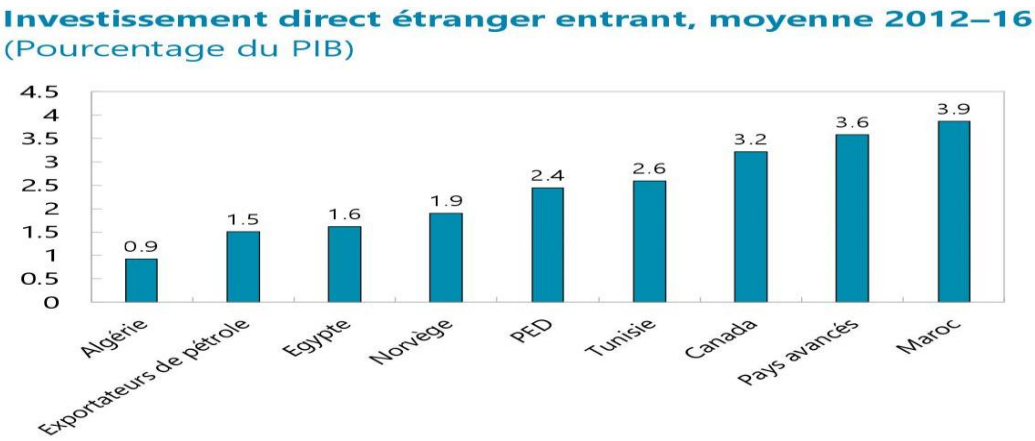
Source : (FMI, 2018, p. 21).

L'accès aux crédits bancaires est limité en Algérie et il est réservé en grande partie au secteur public. Des efforts doivent être fournis pour diversifier les sources de financement pour répondre aux besoins des PME. Il est crucial également de mobiliser l'épargne privée, promouvoir l'esprit d'entreprise et supprimer la bonification des taux d'intérêts en vu d'un meilleur rendement et d'un encadrement des dépenses budgétaires.

4.1. L'encouragement des IDE en Algérie entre (2012-2016)

Il concerne plusieurs secteurs

Graphique 9. Encouragement des IDE en Algérie (2010-2017)



Source : (FMI, 2018, p. 22).

La décision de limitation des importations à contribuer à la hausse des prix des produits locaux. Elle permet également l'essor du marché informel (LATRECHE, 2009). Il est recommandé alors des assouplissements de la règle 49-51 pour encourager les investissements étrangers en Algérie, la révision des règles de la concurrence et des facilitations de transfert de technologie. Il est important aussi d'encourager les exportations hors hydrocarbures et la production nationale.

5. Conclusion

La transition de l'économie algérienne actuelle a pour but à court et moyen terme de rétablir la stabilité macroéconomique, de relancer la croissance du PIB hors hydrocarbures et de créer des emplois, notamment, féminins et pour des jeunes. À plus long terme, l'objectif premier est de diversifier l'économie, surtout par l'encouragement de la production locale. La levée des entraves bureaucratiques et la lutte contre la corruption par l'application rigoureuse de la réglementation.

Par ailleurs, le défi à relever consiste à la stimulation de la concurrence entre les entreprises avec un rôle accru du secteur privé. Malgré des circonstances très défavorables, les autorités sont déterminées à faire avancer leur programme de réformes dans le cadre d'un processus bien échelonné et à un rythme modéré. Les réformes structurelles contribueront à encourager l'activité dans le secteur privé, à améliorer le climat des affaires, à moderniser le cadre de politique monétaire et à accroître l'efficience du marché du travail.

Le financement non conventionnel engagé en Algérie depuis janvier 2018 suite à l'épuisement des fonds de régulation des recettes (FRR) a permis de faire face aux besoins de liquidité né de la néssecité du financement des différents secteurs de l'économie. Cependant, cette masse de liquidité engagée sur le marché va certainement entrainer des conséquences néfastes sur l'inflation qui reste un problème très important avec le chômage au niveau macro économique. En effet, le chômage et l'inflation sont les deux préoccupations majeures da la banque centrale. Cependant, le financement non conventionnel a permis le maintien des

niveaux des salaires des fonctionnaires et les retraités ainsi que le financement des subventions des produits de première nécessité.

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7. Renvois

[1] L'amélioration des recettes fiscales ordinaires n'est pas en reste. Il est ainsi prévu l'accélération du programme de réalisation des centres des impôts, la lutte contre la fraude fiscale et l'amélioration du recouvrement.

[2] C'est la Banque d'Algérie, en qualité de pourvoyeur de financement monétaire au profit du Trésor, qui est chargée d'assurer le suivi et l'évaluation de l'exécution des mesures et actions prévues au programme. La Banque d'Algérie désigne un comité composé de ses représentants et ceux du ministère des Finances.

[3] Le gouvernement envisage une réforme de la politique du logement, la rationalisation des importations de biens et services et la lutte contre la surfacturation des importations. La réforme de la finance et de la fiscalité locales, la réforme bancaire et financière et la réforme du marché du travail.