THE IMPACT OF TERRITORIAL COMPETITIVENESS INDICATORS ON ALGERIAN ECONOMY- BY USING VAR MODEL DURING PERIOD 1991-2016

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Abstract:
This paper aims to study the relationship between the Algerian economy through the indicators of regional competition and economic growth for the period 1991-2016 using the methodology of self-regression models (VAR). The study concluded that regional competition indicators have a significant contribution to the interpretation of changes in the short and long term economic activity.
Key words: economic growth, territorial competitiveness, Algerian economy, indicators, VAR model.

Résumé :
Cet article vise à étudier la relation entre l'économie algérienne à travers les indicateurs de la concurrence régionale et la croissance économique pour la période 1991-2016 en utilisant la méthodologie des modèles d'auto-régression (VAR). L'étude a conclu que les indicateurs de la compétitivité de territoire apportent une contribution significative à l'interprétation des changements dans l'activité économique à court et à long terme.
Mots clés: croissance économique, compétitivité territoriale, économie algérienne, indicateurs, modèle VAR.

1-Introduction

Algeria has been depending on hydrocarbon exports for a long time and that was serving the balance of payment very well when oil prices were high, but by the time when the prices of this last plummeted within the second semester of 2014, it was time to reconsider other economic policies .

Algeria is aspiring to join the World Trade Organization and has established a partnership with the European Union within the

framework of the Association Agreement signed in order to liberalize its economy and for it is a good opportunity 2002 that allows the country to reach new markets for export and attract foreign direct investment flows which is a means of understanding Regional competition, and such capacity actors to produce and retain maximum value are added to the territory by promoting cross-sectorial linkages and making a mix of resource assets to enhance the special character of local products and services.

This study focuses on the reality of the Algerian economy and territorial competitiveness, and therefore the problem of study came As follows: What is The Effect of territorial competitiveness Indicators on the Economic Growth in Algeria?

So the variables used in our models are the competitiveness indicators presented by : export , active population, direct foreign investment, import, unemployment ,exchange rate.

The dependent variable of our subject is the economic growth, presented by GDP per Capita

Autoregressive Vector (VAR) model is used to better understand the problem and target the purpose of this article.

Three steps are the main lines of this work:

-Analysis of the variables

-Study of the causality between these variables

-Modeling and VAR analysis.

Variable data are available as time series from 1991 to 2016.

2-What is Economic Growth?

Economic growth is an increase in the capacity of an economy to produce goods and services, compared from one period of time to another. It can be measured in nominal or real terms, the latter of which is adjusted for inflation. Traditionally, aggregate economic growth is measured in terms of gross national product (GNP) or gross domestic product (GDP), although alternative metrics are sometimes used.

3-Dickey Fuller test of the unit root:

3-1-timeseriesgraphs :
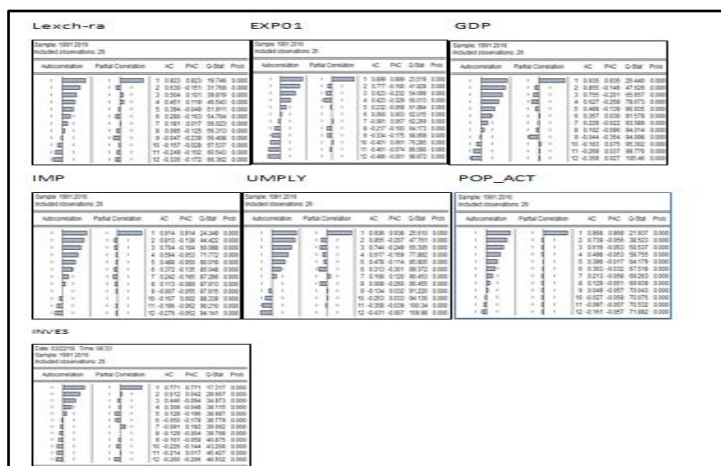
Figure N°1: graphs of the raw series
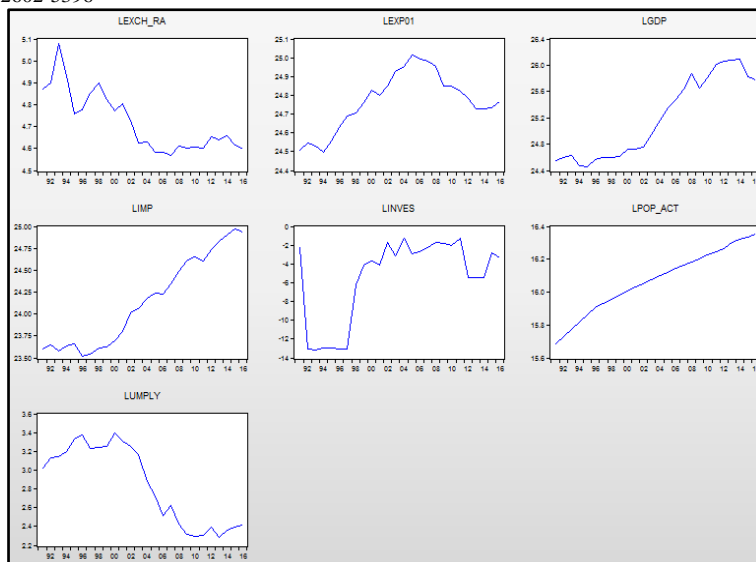
Source: made by the student using eview9

The graphs show that the time series are decreasing or increasing, which leads us to suppose that these series are not stationary.

3-2 Time series correlogram

Figure N°2: Time series correlogram

Source: made by the student using eview9

Graphs show that the time series are decreasing, which leads us to suppose that this series is not stationary

3-3 The models and constructions of the tests:

Model (6) : $\Delta y_t = \rho y_{t-1} - \sum_{j=2}^{p} \varphi_j \Delta y_{t-j+1} + c + bt + \varepsilon_t$(BOURBONNAIS, 2009)

Test construction:

$$H_0 : b=0$$
$$H_1 : b \neq 0$$

Model (5) $\Delta y_t = \rho y_{t-1} - \sum_{j=2}^{p} \varphi_j \Delta y_{t-j+1} + c + \varepsilon_t$(BOURBONNAIS, 2009)

Test construction:

$$H_0 : c=0$$
$$H_1 : c \neq 0$$

Model (4) $\Delta y_t = \rho y_{t-1} - \sum_{j=2}^{p} \varphi_j \Delta y_{t-j+1} + \varepsilon_t$(BOURBONNAIS, 2009)

Test construction:

$$H_0 : \rho=1$$
$$H_1 : \rho < 1$$

The results of Eviews 9 are summarized in the following table:

variable		level			First difference		
		Trend / intercept	Intercept	none	Trendintercept	intercept	none
EXCH_RA	t_c	-2.394950	-4.606718	-0.786117	-4.518566	-4.606718	-4.581302
	T_t (5%)	-3.603202	-2.991878	-1.955020	-3.612199	-2.991878	-1.955681
EXP01	t_c	-0.622006	-1.597235	-0.585323	-3.358647	-3.130280	-3.117360
	T_t	-	-	-1.955681	-	-	-

	(5%)	3.603202	2.991878		3.612199	2.991878	1.955681
GDP	t_c	-1.384584	-0.624177	-1.868381	-3.778230	-3.867845	-3.570072
	T_t (5%)	-3.603202	-2.986225	-1.955020	-3.612199	-2.991878	-1.955681
IMP	t_c	-2.379129	0.565469	3.545807	-2.379129	-2.323839	-2.344736
	T_t (5%)	-3.603202	-2.986225	-1.955020	-3.603202	-2.986225	-1.955020
UMPLY	t_c	-2.081636	-0.342779	-1.083842	-2.081636	-2.038252	-2.070505
	T_t (5%)	-3.603202	-2.986225	-1.955020	-3.603202	-2.986225	-1.955020
INVES	t_c	-3.024741	-1.723652	-0.990972	-3.024741	-2.997046	-3.049450
	T_t (5%)	-3.603202	-2.986225	-1.955020	-3.603202	-2.986225	-1.955020
POP_ACT	t_c	-4.475055	-5.869430	13.07707	-4.475055	-3.076377	-3.019487
	T_t (5%)	-3.603202	-2.986225	-1.955020	-3.603202	-2.986225	-1.955020

Source: made by the student using eview9

The results show that the series are stabilized in the integrated grades of any of the same class, after selecting the appropriate delay length that allows the stability and absence of the self-correlation of the model errors, which allows to capture the effect of innovations in the price of oil and its impact on the variables of the study. Due to the absence of the model, we are now going to analyze the results of the VAR modeling and Causality.

4-VAR modeling:

The number of delays used in the sequence is chosen according to the Akiaki and Schwarz criteria, the delay is 2 or the VAR is stationary and the errors follow a white noise process.

4-1Causality:

Before estimating the modeling of variables previously studied, we study the causality between them in order to know who is causing the other.

The values of the statistics that will allow us to test Grenger's hypothesis of causality are given by Eviews9.

Figure N°3: study of causality (in the sense of Granger)

Pairwise Granger Causality Tests
Date: 04/15/18   Time: 07:10
Sample: 1991 2016
Lags: 2

Null Hypothesis:	Obs	F-Statistic	Prob.
EXP01 does not Granger Cause EXCH_RA	24	3.53436	0.0495
EXCH_RA does not Granger Cause EXP01		1.80094	0.1922
GDP does not Granger Cause EXCH_RA	24	0.44795	0.6455
EXCH_RA does not Granger Cause GDP		3.10003	0.0684
IMP does not Granger Cause EXCH_RA	24	1.13992	0.3408
EXCH_RA does not Granger Cause IMP		1.85054	0.1844
INV does not Granger Cause EXCH_RA	24	0.55696	0.5820
EXCH_RA does not Granger Cause INV		0.76533	0.4790
POP_ACT does not Granger Cause EXCH_RA	24	3.65568	0.0454
EXCH_RA does not Granger Cause POP_ACT		0.53798	0.5926
UMPLY does not Granger Cause EXCH_RA	24	2.89857	0.0797
EXCH_RA does not Granger Cause UMPLY		12.7589	0.0003
GDP does not Granger Cause EXP01	24	4.98502	0.0182
EXP01 does not Granger Cause GDP		2.87752	0.0810
IMP does not Granger Cause EXP01	24	0.37477	0.6924
EXP01 does not Granger Cause IMP		4.02700	0.0348
INV does not Granger Cause EXP01	24	1.64866	0.2187
EXP01 does not Granger Cause INV		2.67764	0.0945
POP_ACT does not Granger Cause EXP01	24	0.01294	0.9872
EXP01 does not Granger Cause POP_ACT		2.59161	0.1011
UMPLY does not Granger Cause EXP01	24	2.99776	0.0739
EXP01 does not Granger Cause UMPLY		5.34900	0.0144
IMP does not Granger Cause GDP	24	0.24132	0.7880

Source: made by the student using eview9

Comparing the Prob values with the 5% risk threshold, we obtain the following results:

-GDP does not cause exchange rate and exchange rate does not cause GDP.

-GDP causes export but export does not cause GDP.

-GDP causes the import but the import does not cause GDP.

-GDP does not cause investment but investment causes GDP.

-GDP causes population but the population does not cause GDP.

-GDP does not cause umplyement and umpleyment does not cause GDP.

4.2 VAR modeling:

VAR modeling is an equation system that allows us to know the influence not only between variables but also between a variable and its lag. Comparing the t-statistics with the tabular statistics of Student at the 5% threshold, which is 2.056, we obtain the following results:

-Last year's GDP (-1) influences this year's import and also this year's export

-GDP (-2) lagged by two years influences this year's investment.

-The investment delayed by one year influences this year's investment.

-The inv (-2) lagged by two years affects this year's GDP and also this year's active population.

- Last year's import influences this year's import and export year. The delayed export of one year influences this year's investment.

-The delayed export of two years influences this year's investment and also this year's import.

-The two-year delayed exchange rate influences this year's unemployment rate

-Last year's active population influences this year's GDP and also this year's labor force

-Unemployment lagged by two years affects this year's GDP and also this year's import.

The estimation of this VAR modeling is as follows:

$\widehat{GDP}$ = 0.213936069506*GDP(-1) - 0.560475414394*GDP(-2) +
36743162607*INV(-1) + 83458154719.2*INV(-2) -
0.872287429758*IMP(-1) - 1.91339351799*IMP(-2) -
3.218377259*EXP01(-1) + 0.474438769534*EXP01(-2) +
48541333.6295*EXCH_RA(-1) - 624207262.003*EXCH_RA(-2) +

190833.624093*POP_ACT(-1) - 140616.344095*POP_ACT(-2) - 1518762800.05*UMPLY(-1) - 5060015481.91*UMPLY(-2) + 57881607001.9

Also this modeling gives us coefficients of determination R^2 Very important:

-The investment, the import, the export, the exchange rate, the active population and the unemployment as well as the GDP delayed explain the GDP of this year by 98.83%.

-GDP, import, export, exchange rate, labor force and unemployment as well as delayed investment explain this year's investment by 75.42%.

-GDP, investment, export, exchange rate, labor force and unemployment as well as delayed imports explain this year's import by 99.77%.

-GDP, import, investment, exchange rate, labor force and unemployment as well as delayed export explain this year's export by 98.02%.

-GDP, import, export, investment, labor force and unemployment as well as the delayed exchange rate explain this year's exchange rate by 75.42%.

-GDP, import, export, exchange rate, investment and unemployment as well as the labor force delayed explain this year's active population by 99.95%.
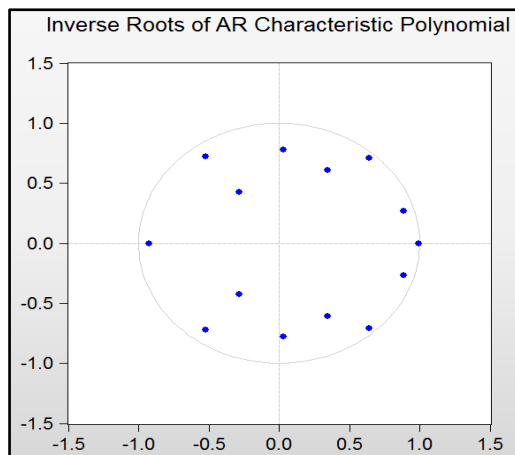
-GDP, import, export, exchange rate, labor force and Investment as well as unemployment delayed explain this year's unemployment by 98.55%.

-The rest and not specified in this model.

Finally, we must check the stationarity of the VAR:

Figure N°4: The inverse root circle of AR

Source: made by the student using eview9

It is observed that all the roots of the characteristic polynomial are of the modulus greater than 1 (the inverse of the AR roots are within the unit circle). So our VAR is stationary.

5-Conclusion:

We conclude, the capacity of the actors to enhance their environment by making it a distinctive element of their territory, while ensuring the preservation and renewal of natural and heritage resources ", the environment appears as a factor of production, possibly non-renewable, of which it is necessary to maximize the use under constraint of preservation of the advantages which it procures

Finally, the application of territorial competitiveness indicators on economic growth will allow us to realize an excellent image in economy, agriculture , tourism and political stability in the latest, we will have a potential attractiveness and in the result an international competitiveness.

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