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MEASURING THE IMPACT OF THE DENSITY OF INSURANCE ON GDP PER CAPITA IN ALGERIA BETWEEN 1990 AND 2018: AN APPLICATION OF AUTO-REGRESSIVE DISTRIBUTED LAG (ARDL) BOUND TESTING APPROACH

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SUMMARY

The insurance sector in Algeria is known for continuous reforms, considering that the insurance sector has an important role in building the national economy and creating an atmosphere of comfort and reassurance, which increases production efficiency and preserves exploited wealth, and from it contributes more to the accumulation of gross domestic product.

This paper aims to examine the impact the of the density of insurance on GDP per capita in Algeria during the period 1990–2018 by applying Auto-Regressive Distributed Lag model (ARDL). The model showed that the current variables are co-integrated. The results suggest that the density of insurance has a positive and significant effect on GDP per capita in the short-run and long-run periods.

Keywords: Density of Insurance; GDP per capita; model (ARDL).

JEL Classification : G22; O47; C50

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INTRODUCTION

Insurance activity is one of the components of the country's financial infrastructure. It can influence the economy on several aspects and on growth in particular. Indeed, so important insurance in the trade and development matrix, where the United Nations Conference on Trade and Development (UNCTAD) formally acknowledged that "a sound national insurance and reinsurance market is an essential characteristic of economic growth." While insurance, like other financial services, has grown in quantitative importance as part of the general development of financial institutions, it also has become qualitative more important due to the increase of risks and uncertainties in most societies. The relationship between the insurance sector and economic growth has received increasing interest among scholars in recent studies. While the results of insurance–growth studies have varied across the countries due to the levels of socio-economic development, nature of economic structures, financial markets development, and analyzed the period and applied methodology. Where the contribution of insurance to GDP of the economies is over 10% in some European countries, such as The Netherlands, the UK and Finland, has shown that it is even higher as the economic development is higher **(Peleckiene, Peleckis, & Dudzeviciute, 2019, p. 1139)**. The insurance sector in Algeria, like other economic sectors, has undergone profound transformations since Independence to this day, and this it is the result of series of reforms undertaken by the authorities in this field, which was in two different phases; the stage of nationalization of the sector and public monopoly, the stage of openness and liberalization of the sector and opening the door for local and foreign properties, Among the most important reforms was to abolish the monopolization of insurance companies, and then open the door for private companies, as a group of private companies entered the Algerian market, which expanded the local competition department in the market **(Dhaif, 2018, p. 11)**. From this standpoint, in the present paper we will try to examine the short and long-term relationship between the insurance sector and economic growth by discussing the following question:

- **What is the impact of the insurance density on the Algerian GDP per capita during the period 1990-2018?**

The objectives and importance of the study

The main purpose of this paper is to measure the impact of the density of insurance on GDP per capita as an indicator of economic growth. This study will contribute in filling the gap in literature about the impact of the insurance sector on economic growth in Algeria since that the empirical study of this issue is limited. We tried a standard model that determines the -nature and strength of the relationship that binds the insurance sector to economic growth in Algeria in the short and long term.

☛ **Limits of the study**

This study discusses the effect of insurance sector on economic growth and we use GDP per capita as an indicator of economic growth. Therefore, we relied only on one indicator of economic growth to examine the impact of insurance sector on economic growth. Also the spatial limit and the temporal limit, the study was in Algeria and the period of study was between 1990 and 2018. Moreover, The period under review is short and the results of the study may not be quite accurate but the study tackles the beginning of the period 90s, particularly this period the insurance sector regime in Algeria was changed to liberalization and opening the way for private and foreign companies, thus updating information on this issue may reveal new dimensions on the phenomenon.

☛ **Methodology of the study**

The methodology of the study relies on the Deductive Approach and the Quantitative research to quantify or to measure the effect of density of insurance on GDP per capita of Algeria by using the ARDL model and the Eviews 10 program.

I.1. The Economic Contribution of Insurance in Algeria: On overview

The Development of Algerian Insurance Market Turnover: From Annex n°01, which includes the development of the economic contribution of insurance, we observe a development in its turnover before the issuance of ordinance 95/07. The latter is the result of the mandatory insurance imposed on the public, as it increased from 8.1 billion DZD in 1993 to 9.7 billion DZD in 1994, then increased by 36% in 1995 compared to the preceding year (13.2 billion DZD). This is mainly caused by the depreciation of the Algerian Dinar by more than 40%. It continued to rise during the following years, especially in 2001, due to the rise of the value of petrol that led to an increase in both public and private investment, thus an increase in the size of the insurance. Since 2003, a new regulation was introduced to insurance about the natural disaster coverage under ordinance 03/12. In 2004, however, it started to also ensure the effects of natural disasters, as well as the occurrence of a major industrial disaster in "Sonatrach" complex in the province of Skikda. The turnover continued increasing with a percentage of 17.7% in 2004 compared to 2003, and with a lower percentage of 13.12% in 2005 to also increase by 15.8% in 2007 compared to 2006, which witnessed the issuance of ordinance 06/04 amended to ordinance 95/07. The latter introduced a series of reforms aimed to further liberalize insurance in order to provide the appropriate conditions to foster its performance, which promotes the services of insurance. This positively mirrors on the insurance turnover that increased by 26.42% in 2008 compared to 2007. However, during the following years, especially 2010 and 2011, the increase ratio saw a drop with a percentage of no more than 5%. This is due to the global decline in oil demand that has negatively affected domestic and foreign investments in Algeria (chahed & darfour, 2017, p. 848). This turnover also maintained increasing yearly, and especially in 2012 and 2013 where the turnover exceeded 100 billion DZD and with an increase ratio of 15% and 13% respectively. However, in 2018, and despite the increase in the turnover to nearly 141 billion DZD, the annual increase ratio decelerated chiefly during the last few years. The reason behind this economic stagnation accompanied with the austerity policy employed by the government due to the decline of petrol value since mid-2014. This, though, does not neglect the significant increase in the number of job opportunities compared to the early years of the economic year that began in 2000. Interestingly, the turnover, after being unable to surpass 20 billion DZD, easily exceeded the mark of 140 billion DZD in 2018.

***Insurance Density*:** the density of insurance signifies the share of an individual from the turnover of insurance, i.e., the individual's spending on the purchase of insurance protection. Consequently, it resembles the total number of the country's insurance turnover attributed to the population. Statistics also show that the insurance density in developed countries is much higher than in developing countries (Bara, 2016, p. 163). According to Annex n°01, the insurance density rates are noticeably low and are not up to the international level. Although it rose to 3380 DZD per individual in 2018, but it remained far from what exists in the world, which exceeds 70000 DZD in some countries. Even compared to Tunisia and Morocco, where it is does not exceed 10000 DZD in Morocco, it is still considerably low. It is also worth mentioning that it increased from 150 DZD per individual in 1990 to an approximate amount of 1000 DZD in 2000, to even a higher amount of 2200 DZD in 2009, then to 3380 DZD in 2018. This is due to the yearly increase in insurance premiums, especially from 2010 onwards when the turnover began to surpass 100 Billion DZD, after not being able to exceed 3.68 Billion DZD in 1990.

Insurance Penetration Rate in Algeria (Insurance Contribution to PIB): what is meant by insurance penetration rate is the ratio of insurance premium income to GDP. It is thus an indication of the importance of insurance in the national economy. Besides, if this rate was high, then this signifies that the insurance is growing faster than the growth of the national economy, which represents net profits (Insurance premiums excluding the paid compensations, and of course, deducting other expenses). To increase this rate, mandating certain branches of insurance is possible. An example of which would be the compulsory civil liability insurance arising from traffic accidents. Remarkably, the relationship of insurance with the

economic growth is a two-way causal relationship, as some academic studies have displayed. The decline of the economic growth rate in the early 1990s negatively affected the insurance turnover, where the insurance penetration rate decreased from 0.75% in 1991 to 0.53% in 1994, and then to 0.45% in 2000 to begin to increase starting from 2001. It however, even in 2018, did not exceed 0.8% despite achieving a turnover of more than 142 billion DZD. The reason for this is that Algeria's economic growth rates are higher than the growth rates of insurance premiums, i.e., the contribution of insurance is almost non-existent, if not non-existent at all, in the gross domestic product (GDP), as confirmed by previous studies.

I. 2. Literature Review

Recently, insurance sector development is an important determinant of economic growth. For that in this section, we shed light on previous studies, which have shown the relationship between financial sector development and economic growth.

Richterkova and **Korab (2013**), This paper studies the impact of insurance activity and economic growth on the sample of 10 published and unpublished studies by using a random-effects model of meta-analysis and The Insurance premium (or its components insurance density and insurance penetration) is taken as the measure of insurance sector activity, GDP per capita then as the measure of economic growth. The results of this study confirm the positive effect of insurance activity on economic growth and are particularly important for policy makers who set the policy towards subjects in the insurance market (RICHTERKOVÁ & KORÁB, 2013). In the same vein, **Ouedraogo and all (2016**) examine the relationship between the development of the life insurance sector and economic growth, for a sample of 86 developing countries over the period 1996-2011. Also, examine the heterogeneous effect of life insurance on growth. The econometric results show on the one hand that the development of life insurance has a positive effect on economic growth per capita and, on the other hand, that this effect varies according to the structural characteristics of countries. Thus, the marginal positive impact of the development of life insurance decreases with the levels of deposit interest rate, bank credit, and stock market value traded, while the effect is greater in countries with high-quality institutions. Finally, life insurance's effect on growth is less for SSA and British legal system countries, compared to non-SSA and non-British legal system countries (Ouedraogo, Guerineau, & Sawadogo, 2016). In contrast in Algeria we found the study of **Bara** (**2016**), she studied the contribution of financial investments of Algerian insurance corporations in financing the national economy during the period 2007–2013, as she analyzed and interpreted the Experience of the financial investments of Algerian insurance corporations. The empirical results show that the turnover of insurance corporations has a statistically significant positive impact on GDP. At the other extreme, the main conclusion was that the Algerian insurance companies are restricted by law in investing in specific proportions, which denies them the freedom of financing strategically targeted investments. On this basis, the most important recommendation of the study is the removal of the restrictions that limit the freedom of insurance companies in directing their financial investments in saving vehicles that have a high degree of security and an appropriate return (Bara, 2016). Additionally**, Bali and seddiki** (**2016**) analyzed and interpreted the role of the insurance sector in the economic growth in Algeria during the period 1995–2014. The results of this study show that the relationship of the insurance sector and economic growth is a very weak, due to the weakness of the insurance market in Algeria financially and technically and the low level of investment**Source spécifiée non valide.**. It has also been stressed by the study of **Dhaif (2018**), he examines the relationship between economic development and insurance sector in Algeria and Morocco during the period 1997-2015, which the results of this study show that the turnover of insurance and the amount of compensation had a weakness impact on economic growth in Algeria and also in Morocco (Dhaif, 2018).

II– METHODS AND MATERIALS

II. 1. Model Specification and Description of the Data

Following the previous study, the estimable model could be expressed as follows in equation 1; for examining the impact of insurance sector on economic growth.

$$ParPib_t = b_0 + b_1 * IntAss_t + \varepsilon_t$$

Where **ParPib** is the real GDP per capita growth, **IntAss** is the density of insurance and ε_t is the error term. We used the annual time series data covering the period 1990-2018. All the collected data of the GDP per capita growth, and assurance intensity gathered from the World Bank.

II. 2. ARDL Model Estimation

The ARDL modeling approach was originally introduced by Pesaran and Shin (1999) and later extended Pesaran et al. (2001). The ARDL co-integration approach has numerous advantages in comparison with other co-integration methods. Unlike other co-integration techniques, the ARDL does not impose a restrictive assumption that all the variables under study must be integrated of the same order. In other words, the ARDL approach can be applied regardless of whether the underlying regressors are integrated of order one [I(1)], order zero[I(0)] or fractionally integrated. Secondly, while other co-integration techniques are sensitive to the size of the sample, the ARDL test is suitable even if the sample size is small. Thirdly, the ARDL technique generally provides unbiased estimates of the long-run model and valid t-statistics even when some of the regressors are endogenous (Odhiambo, 2019, p. 219) . Assumption of ARDL model:

- All variables are stationary at level;
- All variables are stationary at first difference;
- All variables are stationary at level while few stationary at first difference;
- Data must be normally distributed;
- Data must be free from HSK;
- Data must be free from autocorrelation.

The ARDL model used in this study can be expressed as follows in equation 2:

$$\Delta parpib_t = \beta_0 + \sum_{i=1}^{p} \beta_1 \Delta parpib_{t-i} + \sum_{t=0}^{q} \beta_2 \Delta intass_{t-i}$$

$$+\alpha_1 parpib_{t-1} + \alpha_2 intass_{t-1} + \varepsilon_t$$

Where Δ: is the first difference operator;

p, q,r..,z: are the lagged values of the dependent and independent variables to control for higher-order correlation;

$\beta_0, \beta_1, \beta_2$ ….**:** are coefficients correspond to the long-run dynamic relationship.re coefficients of short-run dynamics;

$\alpha_1, \alpha_2, \alpha_3$ ….: are coefficients correspond to the long-run dynamic relationship.

III -RESULTS AND DISCUSSION

1. Unit Root Test

To test the stationarity on differenced variables, we use the Phillips-Perron test, which is presented in Table 1. The result shows that after differencing in variables once, all variables were integrated on the first difference. That means all variables were confirmed to be stationary in this study.

Table 1: Phillips-Perron Unit Root Test

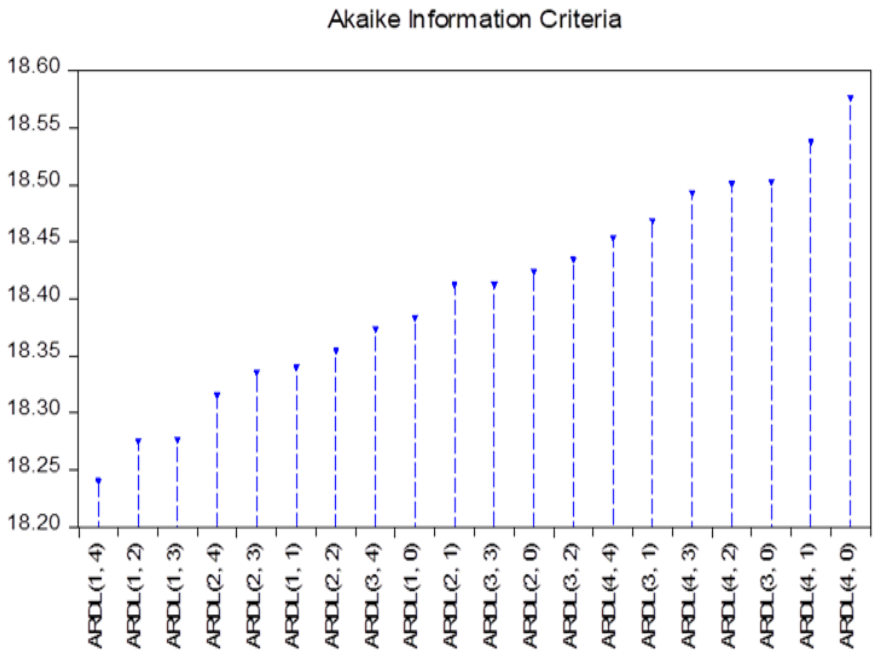
Series	degree of integration	Level			1st difference		
		Intercept	Trend and intercept	None	Intercept	Trend and intercept	None
ParPib	I(1)	-0.13 (0.93)	-2.06 (0.54)	2.56 (0.99)	-4.74 (0.00)	-4.62 (0.00)	-3.39 (0.02)
IntAss	I(1)	0.99 (0.99)	-1.85 (0.65)	3.55 (0.99)	-2.95 (0.00)	-2.98 (0.05)	-1.72 (0.07)

Source: Author's Computation Using Eviews 10

2. Optimum Lag Selection

To select the number of lags required in the co-integration test, we use the Akaike Information Criterion (AIC) as shown in the following Figure 1. The results of AIC showed that the model (1،4) was the optimal lag lengths.

Figure 1: Results of Akaike Information Criteria



Source: Author's Computation Using Eviews 10

3. F-bound Tests

To determine the co-integration between the variables under study, we apply a bound F-test (see Table 2), and when the computed F statistic is greater than the upper bound critical value, we can reject the null hypothesis which means that the variables are co-integrated, but if the F-statistic is less than the lower bound critical value, we cannot reject the null hypothesis meaning that there is no co-integration among the variables. When the computed F-statistic falls between the lower and upper bound, then the results are inconclusive.

The results reported in Table 2 show that the F-statistic is greater than the upper critical bound at all level of significance and K = 1, which means the null hypothesis is rejected and confirms the existence of a long-run relationship between the GDP per capita and independent variables.

Table 2: The F-statistic tests

F-Bounds Test			Null Hypothesis: No levels relationship	
Test Statistic	Value	Signif.	I(0)	I(1)
			Asymptotic: n=1000	
F-statistic	34.02883	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	28		Finite Sample: n=35	
		10%	3.223	3.757
		5%	3.957	4.53
		1%	5.763	6.48
			Finite Sample: n=30	
		10%	3.303	3.797
		5%	4.09	4.663
		1%	6.027	6.76

Source: Author's Computation Using Eviews 10

4. Robustness Checks

We should check the robustness of the optimal model by using the Residual Diagnostics and Stability Diagnostics Before estimating the ARDL model (1.4) in Long-run Coefficients and Error Correction Regression test.

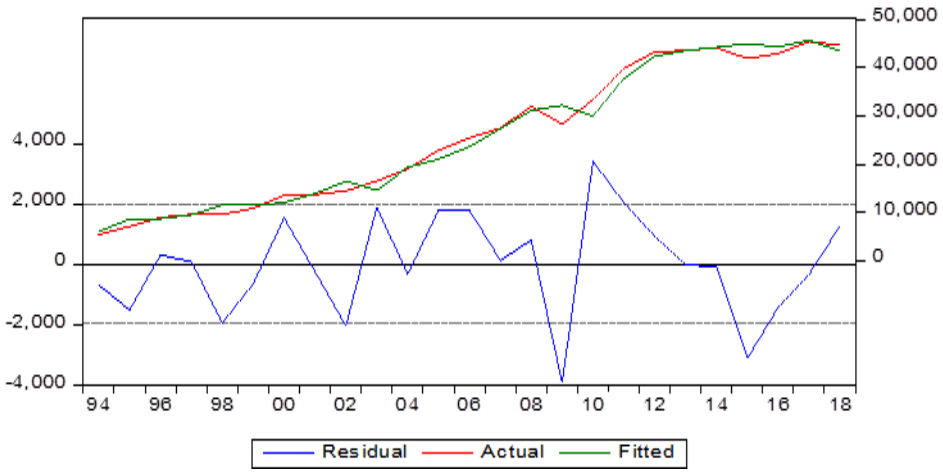
- **Residual Diagnostics:**

a. The actual, fitted and residuals Graph

To estimate the regression of the model, we display a graph of the actual and fitted values for the variables along with the residuals. As shown in the following Figure 2.

Through The results of Figure 2, we observing the approximation of the fitted values of the actual values for variables, this result indicates the quality of the estimated model, for that it is reliable to interpret and analyze the results.

Figure 2: The actual, fitted and residuals Graph



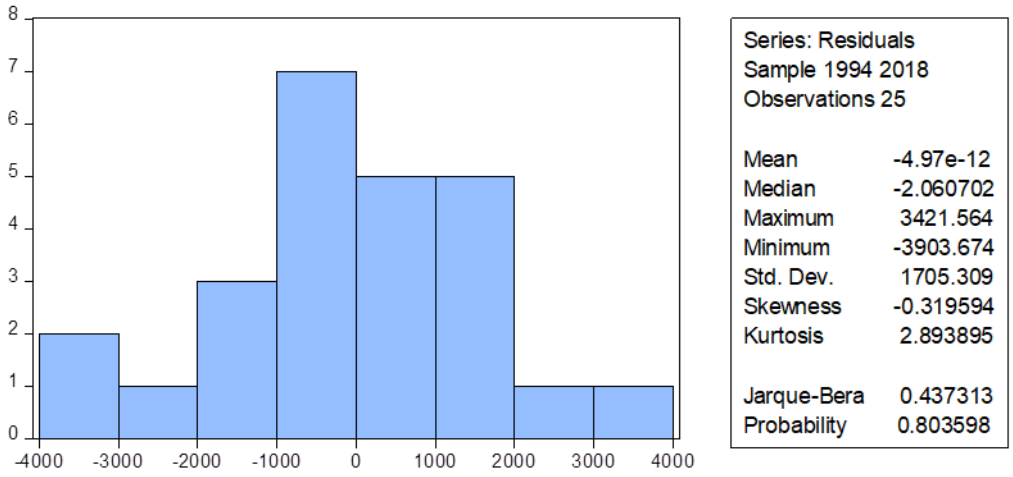
Source: Author's Computation Using Eviews 10

b. Histogram and Normality Test

To display a histogram and descriptive statistics of the residuals, we include the Jarque-Bera statistic for testing normality. As shown in the following Figure 3.

The result of the test was insignificant (α> 0.05) and the value of J-B = 0.80was less than x^2= 5.99. This means accepting the null hypothesis, and residuals are subject to normally distributed residuals.

Figure 3: Normality Test Result



Source: Author's Computation Using Eviews 10

c. **Serial Correlation LM Test**

For testing serial correlation, we use Autocorrelation, Breusch-Godfrey correlation LM test as shown in the following Table 3.

Through The results of Table3, the Q-statistics are insignificant at all lags, and Prob chi-square is greater than 0.05, therefore we accept the null hypothesis (there is no Autocorrelation).

Table 3: Serial correlation LM test

Date: 01/21/20 Time: 21:20
Sample: 1990 2018
Included observations: 25
Q-statistic probabilities adjusted for 1 dynamic regressor

Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob*
		1	-0.051	-0.051	0.0737	0.786
		2	-0.081	-0.083	0.2642	0.876
		3	-0.099	-0.109	0.5648	0.904
		4	-0.100	-0.121	0.8831	0.927
		5	-0.062	-0.099	1.0122	0.962
		6	0.059	0.015	1.1339	0.980
		7	0.275	0.253	3.9685	0.783
		8	-0.033	-0.010	4.0121	0.856
		9	-0.304	-0.299	7.9011	0.544
		10	-0.075	-0.092	8.1521	0.614
		11	0.036	0.059	8.2133	0.694
		12	-0.165	-0.220	9.6265	0.649

*Probabilities may not be valid for this equation specification.

Source: Author's Computation Using Eviews 10

d. Heteroskedasticity Test

To test the variance of error terms whether are constant or not, we use the Heteroskedasticity test. As shown in the following Table 4.

Through The results of Table 4, the f-statistic is insignificant, prob F is greater than 0.05, therefore accepting the null hypothesis (the variance of error terms is not constant).

Table 4: Heteroskedasticity test

Heteroskedasticity Test: ARCH			
F-statistic	1.576037	Prob. F(1,22)	0.2225
Obs*R-squared	1.604379	Prob. Chi-Square(1)	0.2053

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 01/21/20 Time: 21:26
Sample (adjusted): 1995 2018
Included observations: 24 after adjustments

Source: Author's Computation Using Eviews 10

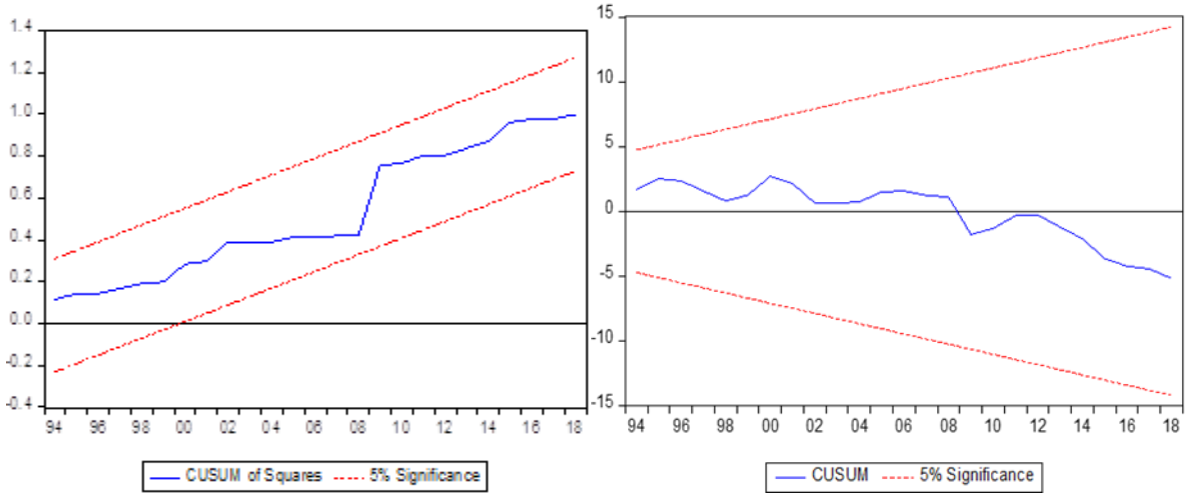
- **Stability Diagnostics:**

a. CUSUM and CUSUMQ of Squares Tests

It is important to test whether the short- and long-term relationships found previously are stable over the entire period of the study. To do this, we use the CUSUM Test and CUSUM of Squares Test to check whether the parameters of the model are stable or not. As shown in the following Figure 4.

Through The results of Figure 4, we note all the plots of statistics CUSUM and CUSUMSQ are inside the critical bounds at 5% level of significance (the blue line is within two red lines) which means that all the coefficients in the error correction model are constant, indicate that our ARDL model is stable which also means that the coefficients of regression are changing systematically.

Figure 4: Cusum Test and Cusum of Square Test



Source: Author's Computation Using Eviews 10

6. Estimated Long Run Coefficients

The purpose of our study is to determine the impact of the density of insurance on GDP per capita through the estimation of equation (2); we chose using the ARDL approach. As shown in Table 5.

The results of long-run coefficients indicate that insurance intensity affects positively and statistical significance at level 5% on GDP in the long-run, and we accept this result; implies that assurance sector has impact on economic growth in the long-run.

Table 5: Long Run Coefficients Test

ARDL Long Run Form and Bounds Test
Dependent Variable: D(PARPIB)
Selected Model: ARDL(1, 4)
Case 2: Restricted Constant and No Trend
Date: 01/21/20 Time: 21:45
Sample: 1990 2018
Included observations: 25

Conditional Error Correction Regression

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1681.661	944.2049	1.781034	0.0918
PARPIB(-1)*	-0.253723	0.263434	-0.963137	0.3482
INTASS(-1)	2622.247	3356.460	0.781254	0.4448
D(INTASS)	12764.56	6107.079	2.090125	0.0511
D(INTASS(-1))	-7543.587	5490.650	-1.373897	0.1863
D(INTASS(-2))	2400.767	5126.202	0.468333	0.6452
D(INTASS(-3))	8029.204	5388.695	1.490009	0.1535

* p-value incompatible with t-Bounds distribution.

Levels Equation
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
INTASS	10335.09	3091.343	3.343236	0.0036
C	6627.947	6148.863	1.077914	0.2953

EC = PARPIB - (10335.0896*INTASS + 6627.9466)

Source: Author's Computation Using Eviews 10

7. ARDL Error Correction Regression Test

We use the ECM to find the short-run impact of the density of insurance on GDP (see Table 6), the ECM coefficient gives an idea about how quickly variables return to equilibrium and it should have a statistically significant coefficient with a negative sign, and here we can see a long-run relationship.

Through The results of Table 6, we found a positive statistically significant relationship between assurance intensity and GDP in the short-term as expected, when the insurance intensity increased by one unit, per capita GDP increased by 12764.56 unit this result validate the pervious study.

The equilibrium correction coefficient (The coefficient of ECM (-1)) is estimated as (CointEq(-1)=-0.2537) (0, 0047) for the model which is reasonably large and highly significant at a 5% level. And imply those deviations from the long-term growth rate in GDP are corrected by 0.2537 throughout the following year which means that 25.37of the % disequilibrium, due to the previous year's shocks, is adjusted back to the long-run equilibrium in the current year. This means that the adjustment takes place relatively quickly, and the negative sign validates the long run relationship between variables.

Table 6: Error Correction Regression test

ARDL Error Correction Regression
Dependent Variable: D(PARPIB)
Selected Model: ARDL(1, 4)
Case 2: Restricted Constant and No Trend
Date: 01/21/20 Time: 21:30
Sample: 1990 2018
Included observations: 25

ECM Regression
Case 2: Restricted Constant and No Trend

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(INTASS)	12764.56	3883.558	3.286820	0.0041
D(INTASS(-1))	-7543.587	4595.405	-1.641550	0.1180
D(INTASS(-2))	2400.767	4820.977	0.497984	0.6245
D(INTASS(-3))	8029.204	3995.826	2.009398	0.0597
CointEq(-1)*	-0.253723	0.123491	-2.054590	0.0547

R-squared	0.391075	Mean dependent var	1607.880
Adjusted R-squared	0.269290	S.D. dependent var	2185.351
S.E. of regression	1868.072	Akaike info criterion	18.08006
Sum squared resid	69793864	Schwarz criterion	18.32383
Log likelihood	-221.0007	Hannan-Quinn criter.	18.14767
Durbin-Watson stat	2.072499		

Source: Author's Computation Using Eviews 10

IV -CONCLUSION

The main objective of this study is to investigate the impact of the insurance sector on economic growth in Algeria. The result of the empirical analysis reveals that insurance sector has a positive impact on economic growth in the long-term and also in the short-term.

The result of this paper confirms the previous studies, which in our case have found the contribution of the insurance sector to economic growth is very weak compared to other sectors or international standards. Whereas the percentage portion of GDP is less than 1% during the study period due to the decline of interest rates as result of macroeconomic variables effects, e.g. inflation in Algeria. Also, the ineffectiveness of the Algerian financial market in general and the stock market in particular which affects adversely the available opportunities for insurance companies to invest their money.

Therefore, we counsel the Algerian authorities to take the following recommendations into consideration:

- Develop the Algerian financial market and set the role of the stock market in the national economy.

- Opening the way for Arab and foreign insurance companies to work in Algeria for rise the competition and benefit from experiences and competencies.

Additionally, we recommend doing a new study about determinants of insurance sector that lessen the contribution of economic growth in Algeria, and another study about the relationship between insurance sector and another macroeconomic indicator in Algeria.

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VI- APPENDICES

Annex (1): the evolution of economic indicators for the insurance sector in Algeria during 1990-2018

Unit	A thousand dinars / consonant	%	A thousand dinars / consonant	One billion dinars	One billion dinars
Year's	PIB per capita	*Insurance Penetration Rate*	Insurance intensity	PIB	Insurance Market Turnover
1990	22,16	0,66	0,15	554,39	3,68
1991	29,35	0,75	0,22	752,59	5,67
1992	40,91	0,62	0,25	1074,7	6,67
1993	44,24	0,66	0,29	1189,8	7,89
1994	54,10	0,53	0,29	1487,5	7,93
1995	71,04	0,61	0,43	1993,5	12,09
1996	89,78	0,59	0,53	2564,7	15,16
1997	95,72	0,56	0,54	2780,2	15,65
1998	95,93	0,57	0,54	2830,5	16,00
1999	108,40	0,53	0,57	3248,2	17,15
2000	135,57	0,47	0,64	4123,5	19,51
2001	136,89	0,52	0,71	4227,1	21,85
2002	144,23	0,64	0,93	4522,7	29,01

2003	**164,92**	**0,60**	**0,98**	**5252,3**	**31,27**
2004	**190,00**	**0,60**	**1,14**	**6149,1**	**36,82**
2005	**228,59**	**0,55**	**1,26**	**7561,9**	**41,65**
2006	**253,92**	**0,55**	**1,39**	**8501,6**	**46,51**
2007	**274,31**	**0,58**	**1,58**	**9352,8**	**53,86**
2008	**319,27**	**0,62**	**1,97**	**11043,7**	**68,09**
2009	**282,64**	**0,78**	**2,20**	**9968,02**	**77,68**
2010	**333,30**	**0,68**	**2,25**	**11991,5**	**81,08**
2011	**397,32**	**0,60**	**2,40**	**14588,5**	**88,15**
2012	**432,29**	**0,63**	**2,70**	**16208,6**	**101,4**
2013	**434,76**	**0,69**	**3,01**	**16650,1**	**115,11**
2014	**440,83**	**0,73**	**3,21**	**17242,5**	**125,47**
2015	**417,94**	**0,77**	**3,23**	**16702,1**	**129,12**
2016	**428,72**	**0,76**	**3,24**	**17408,8**	**131,55**
2017	**453,50**	**0,75**	**3,39**	**18684,1**	**139,52**
2018	**446,21**	**0,76**	**3,38**	**18830,1**	**142,64**

Source: Author's Computation Using

https://www.cna.dz/content/view/full/78/(mode)/note

www.banque-of-algeria.dz