

The insurance industry in Algeria: what is its role in economic development?

صناعة التأمين في الجزائر: ما هو دورها في التنمية الاقتصادية؟

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Abstract:

The cointegration test indicates the existence of a long-run relationship between insurance industry and economic growth. The study shows a negative effect of life insurance penetration on economic growth in the long and short terms, and the existence of a positive impact of non-life insurance penetration on economic growth. Therefore, the finding of this study does strongly support the view that economic growth enhances insurance industry in Algeria.

Key words: Insurance, development, autoregressive, Algeria , economic.

ملخص:

تعالج هذه الورقة العلاقة بين تطوير التأمين والنمو الاقتصادي في الجزائر في المدى القصير والطويل خلال الفترة 1992-2020. يعتمد هذا التحليل على نهج الانحدار الذاتي الموزع (ARDL) ونموذج تصحيح الخطأ غير المقيد (UECM). يشير اختبار التكامل المشترك إلى وجود علاقة طويلة الأمد بين صناعة التأمين والنمو الاقتصادي. تظهر الدراسة الأثر السلبي للتأمين على الحياة على النمو الاقتصادي في المدى الطويل والقصير، ووجود تأثير إيجابي للتأمين على غير الحياة على النمو الاقتصادي. لذلك، فإن نتائج هذه الدراسة تدعم بقوة الرأي القائل بأن النمو الاقتصادي يعزز صناعة التأمين في الجزائر. الكلمات المفتاحية: التأمين، التطور، الانحدار الذاتي، الجزائر، الاقتصادي.

1. INTRODUCTION

Insurance sector leads to economic growth by mobilizing savings and encouraging investments to promote financial stability. In this sense, the growing interest between insurance and other financial sectors emphasizes the possible role of insurance companies in economic growth (Rule, 2001).

Despite the benefits of the insurance businesses to economy, insurance activities in Algeria still remain very low. One reason is the fact that insurance market in Algeria is characterized by very weak insurance culture, people consider conventional insurance not shariah compliant. Accordingly, most insurance products are compulsory, such as civil liability insurance of motor vehicles, fire

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insurance for institutions, and natural disaster insurance (*started in 2003 after Algiers's flood in 2001 and Boumerdes's earthquake in 2003*).

Indeed, the insurance sector in Algeria is very low if we consider the volume of total premiums. According to the annual report 2015 issued by the global reinsurer Swiss Re², Algeria was ranked 64 out of 147 countries in the world in term of collected premiums, down from 67 in 2013. Meanwhile, its global market part is estimated to 0.03%. In Africa, the country was ranked sixth behind South Africa (18), Morocco (52), Egypt (60), Nigeria (61) and Kenya (62). In 2014, its total estimated premiums was 1.59 million dollars which meant that they contributed 2.32% of the total African insurance market, estimated at 68.9 billion dollars.

In this context, for an optimal financial structure, many studies made clear that the basic components such as financial markets, financial services, and intermediaries (*which include banks, insurance companies, and mutual funds*) would promote long-term economic growth (Levine, 2005); (Dolar, 2002)). In this sense, both financial intermediaries and markets are valuable for growth and relying only on reverse causality could not push the relationship (Levine, 2005).

However, studies did not pay much attention to insurance until the end of the last century. According to *Beenstock (1988)*, insurance development is assumed to be correlated with GDP. In addition, *Outreville (1990)* examined the relationship between insurance and economic growth in developing countries and showed that life and casualty insurance are among the major factors responsible for economic growth. Indeed, insurance companies are considered to be one of the most important financial institutions which attract savings. They become also an important part of economic and social policies because they collect funds to accelerate development and cover various risks that economic actors are exposed to.

In this regard, the current article examines the possibility of the existence of a causal relationship between insurance (*life and nonlife insurance*) and economic growth in Algeria. The importance of the study stems from the economic role that insurance industry plays by providing sufficient funds to finance investment projects, reduce potential risks, provide jobs, and increase national income. Another importance is associated to the relation between insurance and growth in Algeria, where the insurance sector is very critical, unlike the most studies carried out in developed. In this regard, the objective of this study is to evaluate the long-run relationship between insurance market size and economic growth in Algeria. To our best knowledge, this is the first study that examines this relation in the country.

The remaining study is organized into four sections. In section 2, a brief summary of the characteristics of insurance in Algeria is provided. The empirical studies on the causal relationship between insurance and economic growth is considered in section 3. The specification of the model is contained in section 4. The last section contains a conclusion.

²<http://www.swissre.com/sigma>.

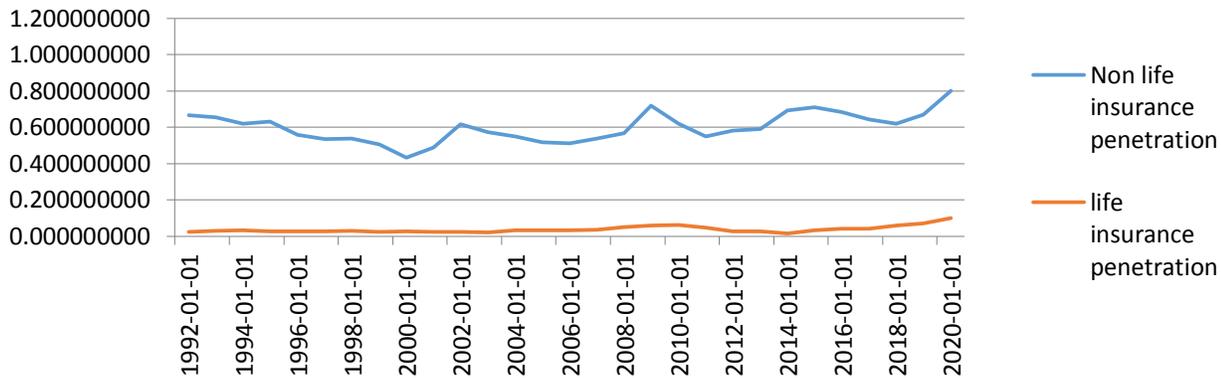
2. The main characteristics of insurance in Algeria

The most important characteristics of the insurance market in Algeria can be summarized as follows:

2.1. Undeveloped insurance sector

The rate of insurance penetration (gross premiums / gross domestic product) in the Algerian insurance market is very weak, representing only 0.8% of GDP in 2020, an average of 0.6% over the past decade, unlike the average of 8.15% in developed countries and 2.71% in emerging countries. The figure 1 shows the insurance penetration degree in Algeria during the period from 1992 to 2020.

Figure 1. Insurance penetration in Algeria (1992-2020).



Source : Swiss Re, sigma reports, world bank database, and Algerian insurance board, consulted on 04/12/2021.

Insurance penetration rates had known turbulent and instable moments during the period 1992- 2020 (Merghoum, et al, 2018). The maximum rate was 0.8% in 2020. The contribution of the insurance sector in Algeria's GDP remains weak, despite the series of economic reforms to liberalize the market by eliminating public insurance monopoly and opening the market to private and foreign companies.

In addition, insurance density (ratio of total insurance premiums to total population) was estimated at 40 USD in Algeria in 2014 , compared to the world's average of 662 USD. In the same year, the coverage rate reached only one point of sale per 28,000 people (*compared to the global average of one point of sale for every 5,000 people*).

Table 1. Insurance density index during the period (2010-2020)

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Algeria	32.8	33	34.3	39	40	31.8	30	29	28	29	24
Tunisia	74.8	77	76.3	77	80	73.1	72.5	71	75	71	76
Morocco	80	89	87.6	97	102	90.8	102.3	104	127	127	138

Source: Swiss Re, sigma Reports 2010 to 2020, (<http://www.suissre.com/sigma>).Also,National Insurance Board, Algeria, The conditions of notes 2010-2020 (<http://www.cna.dz/>).

The Algerian insurance market recorded stable rates of insurance density, reaching its maximum level of 40 USD in 2014, and its minimum level of 24 USD in 2020.In general, insurance density

remains at lower levels compared to that in the Maghreb countries. Insurance density in Morocco was 138 USD in 2020 and 76 USD in Tunisia. However, Maghreb insurance density is still far from the global average of 622 USD.

2.2. Dominance of public companies in the insurance market

The Order n° 95/07 issued on 25/01/1995 allowed the liberalization of the insurance sector in Algeria by opening the way for private and foreign insurance companies to operate in the country. Before this period, the sector was characterized by the dominance of public monopoly. The sector had been comprising about (3/4) of the national Insurance industry. Today, the Algerian insurance market consists of 21 insurance companies, 10 of them are public and 9 are private and two cooperatives. We notice that after more than 20 years not much has changed.

The following table shows damages insurance premiums by branches and capital owners, in 30/06/2021.

Table 2. Damages insurance premiums in 30/06/2021. (unity: USD)

Branches of insurance	Public institutions	Private institutions	mixed institutions	Total market	Market share of private businesses
Cars	22011460805	10606969329	404573161	33023003295	32.1 %
Fire and other dangers	22339564329	4227316349	260215773	26827096450	15.8 %
Transportation	2004488492	498700124	43403344	2546591960	19.6 %
Agriculture	1038558170	36152624	0	1074710794	3.4 %
Loan Guarantee	1212185955	23877249	0	1236063204	1.9 %
Total	48606257750	15393015675	708192278	64707465703	23.8 %

Source: National Insurance Board, The conditions of notes 2021, Algeria, (<http://www.cna.dz/>).

Table 2 shows that the insurance market is dominated by the public companies which control 75% of the total insurance premiums during the year of 2020, estimated at 486 billion DZD, the rest of the market belongs to private and mixed companies with a turnover estimated at 153 billion DZD. Despite the proximity in the number between public and private companies, the public sector outperforms three times the private sector due to their very long experience in the field.

2.3. Dominance of the damages insurance branch (non life insurance)

The Algerian insurance market is known for its great dominance of the damages branch, especially vehicle branch. The reason is that vehicle insurance is compulsory. This reality has systematically led to the rise of motor insurers, representing about 51% of the market, while life insurance represents only 7% of the market share, compared to 60% in developed countries (see table3).

Table 3. Insurance premiums in Algeria, 30/06/2021

Insurance Branches	Turnover		Structure		Evolution 2020/2021	
	2020/06/30	2021/06/30	2020	2021	Value	Percent
Dammages Insurance	60801937282	64707465703	85.6%	86.2%	3905528421	6.4 %
Life Insurance	6573167104	6553007473	9.3%	8.7%	-20159631	-0.3 %
Total	67375104386	71260473176	94.9 %	94.9 %	3885368790	5.8 %

Source: National Insurance Board, the conditions of notes 2006-2015, Algeria, (<http://www.cna.dz/>).

2.4. The weakness of foreign investments

Algeria suffers from shortage of foreign investments in the insurance sector. Indeed, the presence of foreign companies is still very small, despite the passage of 20 years since the promulgation of the law n° 95/07 which aimed at liberalizing the insurance market in favor of domestic and foreign investors.

In this respect, among the most important obstacles facing foreign investors, we can outline the bureaucracy characterizing the financial and banking system which heavily discourages investors. We add possibly the absence of attractive incentives for foreigners in the insurance sector, such as tax reductions. Moreover, another problem worth mentioning is the impossibility for foreigners to get real estate acquisition in Algeria, which is a major obstacle to foreigners.

3. Literature review

Different studies have presented evidence that financial development has a positive impact on long-run economic growth . These studies explored the relationship between the development of insurance industry and economic growth (Peleckienė, 2019). By conducting cointegration and causal tests, based on annual data for real GDP and total real premiums during the period from 1961 to 1996, Ward (2000) indicated a short-and long-run dynamic relationship between economic growth and insurance industry for some OECD countries. In this sense, the results showed a one-way causal relationship between insurance and economic growth in Canada and Japan, a two-way relationship in Italy, and no relationship between variables in countries like the US and the UK.

Also a study by Kugler (2005) showed a long-term relationship between the development of the insurance market and economic growth by using Johansen’s λ_{Trace} and λ_{max} cointegration tests. This is contrary to the results found by (Ward, 2000), which emphasized that there was no relationship between economic growth and the insurance industry in some countries, including the UK and the US. The results showed for most cases, a long run relationship between insurance market size and economic growth rather than a cyclical effect. In turn Khadka (2020) found a positive and significant relationship between insurance penetration and economic growth.

Another article by Arena (2008) discussed the causal relationship between insurance market activity and economic growth, using the generalized method of moments (GMM) for annual time series data of 55 countries over the period 1976-2004. He found a positive and significant causal relationship

and therefore concluded that for life insurance, developed countries drive the results, and for non-life insurance, both developed and developing countries who drive the results.

Regarding insurance density, as a measure of the evolution of insurance. *Han et al. (2010)* considers that its development is strongly correlated with economic growth. The researchers employed *GMM* models on a dynamic panel data set of 77 economies for the period 1994–2005. Their conclusion showed that the overall insurance development, life insurance and non-life insurance played much more important role in developing countries than in developed countries.

On the other hand, *Ching (2010)* provided sufficient evidence to support a short- and long-term relationship between the indicator of life insurance (total assets of Malaysian life insurance sector) and real GDP. The results found that Malaysia's life insurance sector could constitute a financial intermediation to generate long-term savings, and thereby promoting capital investment as well as economic growth. Moreover, *Lee (2011)* examined specifically the relationship between insurance market's activities and economic growth for 10 OECD countries during the period 1979-2006. The results of the long-run regression demonstrated a significantly positive relationship between real GDP and insurance activities. The non-life insurance market activities had a greater influence on real GDP than the life insurance market activities. In the same direction, *Alhassan (2014)* reported a long-run positive relationship between insurance penetration and economic growth in Ghana from 1990 to 2010 by using the autoregressive distributed lag (ARDL) bounds approach to cointegration by (*M. H. Pesaran, Shin, Y., & Smith, R. J, 2001*) (*M. H. Pesaran, Shin, Y., Smith, R.J, 1996*). The results support the hypothesis that insurance promotes economic growth.

Besides, *Liu (2015)* tested the causal relationship in the short and long term between insurance activity and economic growth related to seven industrialized countries, based on annual data during 1980- 2011. His empirical study proved a long-term relationship between insurance density and GDP. On the other hand, it proved that the short-run causal relationships are country-specific. Meanwhile, a study by *Pradhan (2016)* revealed a short-term causal relationship between insurance market penetration and economic growth after using panel data of ASEAN countries during the period 1988-2012.

In our study, we attempt to illustrate the nature of the relationship between insurance industry and economic growth in Algeria during the short and long terms using autoregressive distributed lag (ARDL) model , proposed by (*M. H. Pesaran, Shin, Y., & Smith, R. J, 2001*).

4. Methodology

4.1. Data

The variables are formulated on the basis of economic theory and tested using econometric techniques. Data covered the period (1992-2020). This study employs annual time-series data on GDP growth, aggregate life and non-life insurance penetration, trade openness (the sum of exports and imports to GDP), gross fixed capital formation and consumer price index as a proxy for inflation. Data on insurance penetration were obtained from the global financial development

database (GFDD) from the World Bank website while the other macroeconomic variables were received from the world development indicators (WDI) database.

Table 4. Variables Description

Variables	Symbols
gross domestic product growth	LGDP
insurance penetration	Log_IP
Life insurance penetration	Log_LIP
Non life insurance penetration	Log_NIP
gross fixed capital formation	LGCAP
Index of consumer prices	LIPC
Trade openness	LTRD

4.2. Empirical model

We have many tests to demonstrate the existence of cointegration between variables, for example: *Engle (1987)* and *Johansen (1990)* approaches focus on cases in which time-series variables are integrated of the same order (first order), and these tests yield inaccurate outcomes in case if the sample size is small. For this, the approach of autoregressive distributed lag (ARDL) model has become commonly used in recent time. This method, presented by (M. H. Pesaran, Shin, Y., & Smith, R. J, 2001) (M. H. Pesaran, Shin, Y., Smith, R.J, 1996) is based on the estimation Unrestricted Error Correction Model (UECM).

The ARDL model is specified below:

$$\Delta y_t = C + \alpha_1 y_{t-1} + \alpha_2 X1_{t-1} + \alpha_3 X2_{t-1} + \dots + \alpha_{k+1} Xk_{t-1} + \sum_{i=1}^{p-1} \phi_{1i} \Delta Y_{t-i} + \sum_{i=0}^{q_1-1} \phi_{2i} \Delta X1_{t-i} + \sum_{i=0}^{q_p-1} \phi_{3i} \Delta X2_{t-i} + \dots + \sum_{i=0}^{q_{k-1}} \phi_{k+1i} \Delta Xk_{t-i} + \varepsilon_t$$

Where Δ is the difference operator while ε_t is white noise error term. The level relationships between the model variables can be conducted based on the F-statistic by imposing restrictions on the estimated long-run coefficients of one period lagged level of the variables equal to zero, stated below as:

$H_0 : \alpha_1 = \alpha_2 \dots \dots = \alpha_{k+1} = 0$ No level relationship

Against the alternative hypothesis as:

$H_1 : \alpha_1 \neq \alpha_2 \neq \dots \dots = \alpha_{k+1} \neq 0$ Level relationship

The resulting *F* computed is compared with the simulated critical values from Alhassan (2014) generated specifically for such a small sample data employed in this study. If the computed *F* statistics is below the lower bound value *I*(0), the null hypothesis of no level relationship cannot be rejected. However, the computed *F* statistics is higher than the upper bound value *I*(1), the null hypothesis of no level relationship is rejected.

4.3. Unit Root Test

Before employing the ARDL method cointegration, we test the stationarity of the variables to make sure that the series are free of $I(2)$ variables. We have employed the Augmented Dickey-Fuller (ADF) (1979) test and the Phillips (Phillips, 1988) and Perron (PP) (1988) test. Table 5 shows the results:

Table5.Unit Root test

Series	ADF		PP		Results
	I(0)	I(1)	I(0)	I(1)	
LGDP	0.5225	0.0000	0.3751	0.0000	I(1)
Log_IP	0.7261	0.0000	0.8159	0.0001	I(1)
Log_LIP	0.9833	0.0438	0.9728	0.0114	I(1)
Log_NIP	0.7443	0.0001	0.5524	0.0079	I(1)
LGCAP	0.8273	0.0000	0.8226	0.0004	I(1)
LIPC	0.0028	0.0000	0.0000	0.0000	I(0)
LTRD	0.5612	0.0001	0.6651	0.0016	I(1)

We verified stationarity by ADF and PP in Eviews 9.The use of the ADF test shows that the calculated values for each variable is less than the tabulated values at 5%. Therefore, we accept the null hypothesis that indicates an instability of the time series for these variables. We conclude that these variables are stationary at first difference. Similarly, PP test shows the same results, after taking the first difference, all the time series become stationary at 5% level.

We conclude also that all variables are independent at first difference and there is no integrated variable at second difference. Therefore, we can apply the integration methodology using the ARDL model.

4.5. Lag Order Selection Criteria

The Lag Order Selection Criteria test determines the appropriate lag order which provides the lowest value of the two indicators Akaike Information Criterion (Acemoglu) and Schwarz criterion (SC) to the variables. The test results are shown in the following table:

Table 6.Lag Order Selection Criteria

Lag	LR	FPE	AIC	SC	HQ
0	NA	0.211803	15.47496	15.76292	15.56059
1	153.3323*	0.001534*	10.47501	12.49076*	11.07440*
2	39.45658	0.002065	10.32335*	14.06688	11.43650

* indicates lag order selected by the criterion
 LR: sequential modified LR test statistic (each test at 5% level)
 FPE: Final prediction error
 AIC: Akaike information criterion
 SC: Schwarz information criterion
 HQ:Hannan-Quinn information criterion

The optimal lag is selected based on AIC as shown in the above table 6.

Building on (M. H. Pesaran, Shin, Y., & Smith, R. J, 2001) the ARDL model has been formulated as follows:

$$\Delta(GDP)_t = C + \alpha_1(GDP)_{t-1} + \alpha_2(IP)_{t-1} + \alpha_3(GCAP)_{t-1} + \alpha_4(IPC)_{t-1} + \alpha_5(TRD)_{t-1} + \sum_{i=1}^{p-1} \phi_{1i}\Delta(GDP)_{t-i} + \sum_{i=0}^{q_1-1} \phi_{2i}\Delta(IP)_{t-i} + \sum_{i=0}^{q_2-1} \phi_{3i}\Delta(GCAP)_{t-i} + \sum_{i=0}^{q_3-1} \phi_{4i}\Delta(IPC)_{t-i} + \sum_{i=0}^{q_4-1} \phi_{5i}\Delta(TRD)_{t-i} + \varepsilon_t \dots \dots \dots (01)$$

4.6. Bound Test

The ARDL Bounds cointegration test results showed that the computed *F* statistics for all the three models are greater than *I*(1).Thus, the null hypothesis of no level relationship is rejected which implies the existence of a long-run relationship between insurance penetration and economic growth in Algeria. This is in line with the results of Ward (2000), Kugler (2005), Han (2010) and Alhassan (2014) in examining the insurance- growth relationship.

Table 7. Bounds results for level relationship

K=5	F-stat	90%		95%	
		I(0)	I(1)	I(0)	I(1)
F(GDP/IP,GCAP,IPC,TRD)	4.769408	2.26	3.35	2.62	3.79
F(GDP/LIP,GCAP,IPC,TRD)	7.580656				
F(GDP/NIP,GCAP,IPC,TRD)	4.654932				

I(0) and *I*(1) represent lower and upper bounds, respectively. K is the number of regressors.

4.7. Estimating the long-term relationship:

Table 8 shows the following observations: After making sure of the existence of a cointegration relationship between insurance industry and economic growth, we have measured the long-term relationship under the ARDL model to obtain long-term parameters.

Table 08. The results of the long run ARDL estimation

Dependent Variable: D(GDP)			
Series	Long Run Form		
	Model 1	Model 2	Model 3
Log_IP	0.720438*** (0.0001)		
Log_LIP		-0.493603 (0.6283)	
Log_NIP			0.617810*** (0.0002)
LGCAP	0.688479*** (0.0002)	0.837987*** (0.0001)	0.658415*** (0.0001)
LIPC	-0.022221*** (0.0005)	-0.043090** (0.0260)	-0.024123 (0.1398)
LTRD	-0.318699 (0.0921)	0.318699** (0.0200)	-0.079011 (0.6541)
C	1.931940*** (0.0002)	2.979998*** (0.0005)	2.072555*** (0.0003)

ARDL (1, 0, 0, 2, 2) for model (1), ARDL (1, 2, 1, 2, 0) for model (2) and ARDL (1, 0, 0, 2, 2) for Model (3)

*Significance at 10 %,**Significance at 5 %,***Significance at 1 %.

From table 8, we can observe the following points:

Aggregate insurance penetration was found to have significant and positive relationship with economic growth at 1%. The coefficient of 0.7204 implies that the percentage increase in insurance penetration will lead to a 0.7204% growth level in real economy. In addition to the role of insurance in facilitating economic transactions through the conversion and the division of risk, it contributes to promoting economic growth in the long term. The results are in line with Azman-Saini (2011) findings, which have concluded that the insurance sector affects growth mainly by stimulating productivity in developed countries, while it reinforces the accumulation of capital in developing countries.

The total life insurance penetration has a negative impact on economic growth and is not statistically significant in long term.

The total non-life insurance penetration has positive effect on economic growth in long term with a statistical significance at the 1% level (0.6178). Thus, any increase in premiums by 1% will lead to an increase of economic growth by 0.6178%.

The existence of negative effect of the fixed capital formation variable (total domestic investment) on economic growth in the three models. This reflects, on the one hand, the nature of the economic system in Algeria which depends heavily on oil revenues as a financial resource. On the other hand, it confirms that the oil sector is very attractive to domestic and foreign investors.

The inflation rate measured by the general level of prices has a negative impact on economic growth, which is one of the obstacles that affect the insurance activity. When inflation increases, the value of compensation increases too, which is seen as a burden on insurance companies. On the other hand, inflation may reduce purchasing power and lead to lower insurance demand of individuals.

A negative impact of international exchange as an indicator of trade opening on economic growth. This result may be justified by the low oil prices in international markets during the period of the study. One can argue the absence of the productivity of all sectors in Algeria except only its heavy dependence on oil exports.

4. 8. The short-term balance

For the purpose of measuring the short-term relationship, the error correction model was used.

Table 09.Short-run error correction models

Dependent variable : D(GDP)			
Series	Model 1	Model 2	Model 3
Δ(Log_IP)	0.720438* (0.0000)		
Δ(Log_LIP)		-0.034180 (0.6283)	
Δ(Log_NIP)			0.617810 (0.0002)
Δ(LGCAP)	0.688478*** (0.0000)	0.837987*** (0.0000)	0.658415 *** (0.0000)
Δ(LIPC)	-0.022221 (0.1320)	-0.043090** (0.0260)	-0.024123 (0.1398)
Δ(LTRD)	-0.111878 (0.4848)	0.318699** (0.0200)	-0.079011 (0.6541)
CoinEq(-1)	-0.902426*** (0.0000)	-0.848114*** (0.0002)	-0.885410*** (0.0000)
F-Stat	514.6603 (0.00000)	234.1228 (0.00000)	418.1568 (0.00000)
R- Squared	0.996343	0.993212	0.995503
Adj. R- Squared	0.994407	0.988970	0.993122
DW stat	1.530063	1.986861	1.490008

*Significance at 10 %,**Significance at 5 %,***Significance at 1 %.

Table 9 expresses the error correction model and the elasticity between the variables of the studied models. We can observe that some variables are statistically significant between 1%, 5% and 10% and the effects are divided between what is negative and what is positive.

For example, gross premiums to GDP positively affect short-term economic growth and are statistically significant at 1% (0.0000). An increase in the insurance penetration index will result in a 1% increase in economic growth by 1.72%.

The error correction coefficient of CoinEq (-1), which means the speed of error correction, has a negative signal in the three models. Moreover, it is very significant at 1% (0.0001) for all models.

This result is seen as an evidence for a long-term equilibrium relationship between model variables. This raises the accuracy and correctness of the long-term equilibrium relationship. The error correction mechanism exists in the three models. The parameter measures the speed of return to equilibrium in the long term.

From the foregoing, a number of conclusions can be presented:

As expected, the total premiums have a positive sign but little impact on economic growth both in the short and long term, due to the following reasons:

-The series of economic reforms aimed at liberalizing and opening the Algerian market by abolishing monopoly and allowing foreign insurance companies to compete with national companies

have played an important role in regulating the sector. However, they are not considered sufficient to promote insurance activity and the contribution of the insurance sector to GDP remains weak and does not reflect the available resources.

-The low impact of insurance sector on economic growth is due to the inadequate capacity to raise funds and gain new customers. Insurance companies avoid subscribing in certain types of insurance. They prefer to keep the insurance types that they have experience in and could master their risks.

The positive impact of insurance on economic growth is due to the significant increase in total premiums for damage, the reasons are:

Property insurance is the most demanding insurance contrary to life insurance which knows weak demand. The reason for the increase in insurance premiums on property and casualty is the size of the vehicle fleet in Algeria which is one of the compulsory insurance, as well as the evolution of the sale of cars in installments. In addition, the beginning of compulsory natural disaster insurance in 2003 following the Boumerdes earthquake, besides the imposition of travel insurance for passengers traveling to an EU country.

A significant negative impact of the rate of penetration of life insurance on economic growth in Algeria may be due to the following reasons:

The Algerian society's view of life insurance is not seen in accordance with Islamic law. Besides, the low of income average of Algerian individuals does not encourage optional insurance. Also, the financial government intervention in every natural disaster reduces the voluntary subscription to life insurance.

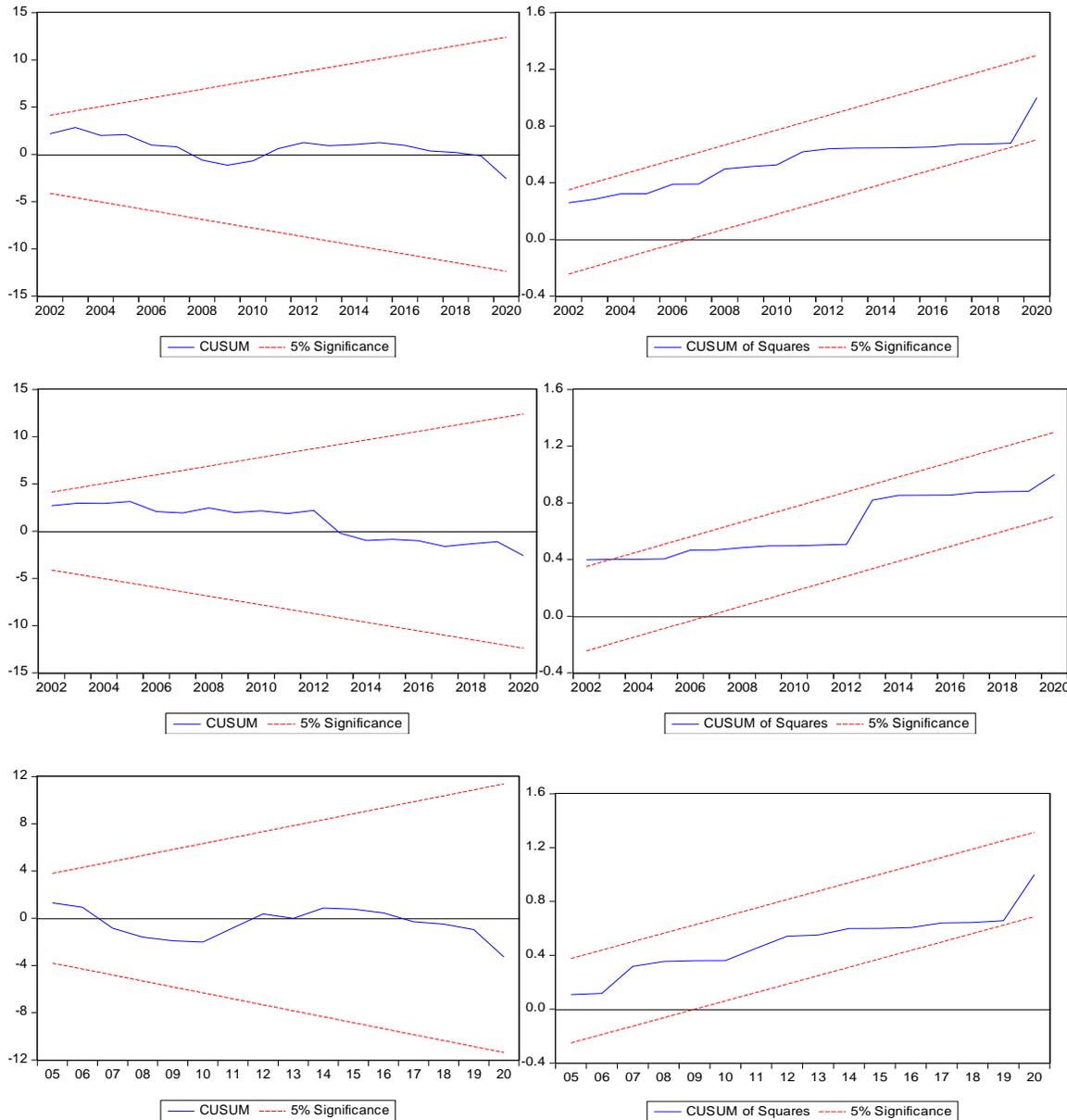
The effect of Law n°375-09 of November 16, 2009, stipulating the increase of the capital of life insurance companies from 200 million dinars to 1 billion dinars has contributed to hinder the activity development due to the limited financial capabilities of the companies as well as the weakness of the Algerian financial market as a source of fund raising.

5. Stability Test

In order to make sure that data in this study is free of any structural changes, one of the appropriate tests to carry out is the cumulative sum of recursive residuals (CUSUM), or the cumulative sum of squares of recursive residuals (CUSUM of Squares). The two tests are the most important in the field as they show two essential aspects: the existence of a structural fluctuation in data as well as the stability and coherence of long-term parameters with short-term ones.

The coefficients stability of the error correction formula for the ARDL model is achieved if the CUSUM and CUSUM of Squares tests are included within the critical limits at 5%.

Figure 2. CUSUM and CUSUM of Squares Tests



From figure 2, we find that the *CUSUM* test for the three models expresses a median line within the boundaries of the critical area, indicating a stability of the models at a significant limit of 5%. The *CUSUM* of Squares also crosses the median line within the limits of the critical area. It is clear from these two tests that there is a stability and consistency in the three models regarding the long- and short-term results.

5. Conclusion

The aim of this study was to measure the impact of the insurance industry on short- and long-term economic growth in the Algerian economy during the period 1992-2020, based on the Autoregressive Distributed Lag (ARDL) approach. Cointegration tests revealed the presence of a long-run equilibrium relationship between the insurance activity and economic growth.

In this regard, the insurance activity development on damages and casualties enhances to some extent economic growth in Algeria, while life insurance has not yet reached the required level of development to contribute to support economic growth, and this may be the result of several reasons:

- The absence of insurance culture among the Algerian people. In this respect, we need new insurance marketing plan to raise individual awareness about the variety of insurance products.
- The current developed social protection system in Algeria plays an alternative role for life insurance system and constraints therefore its development.

The very slow process of insurance compensation led by the company created a kind of frustration Acaravci (2017) and lack of interest among people in the insurance activities.

The products offered are not keeping up with to the needs and beliefs of the majority of people.

6. References

- Acaravci, A., & Erdogan, S. (2017). *The Relationship between institutional structure and economic growth: A comparative analysis for selected countries.* . *International Journal of Economics and Financial* (7(6)), 141-146.
- Acemoglu, D., Johnson, S., Robinson, J., & Thaicharoen, Y. (2003). *Institutional causes, macroeconomic symptoms: volatility, crises and growth.* *monetary economics*(50(1)), 49-123.
- Alhassan, A. L., & Fiador, V. . (2014). *Insurance-growth nexus in Ghana: An autoregressive distributed lag bounds cointegration approach.* *Review of Development Finance*, 4(2), 83-96.
- Arena, M. (2008). *Does insurance market activity promote economic growth? A cross-country study for industrialized and developing countries.* *Journal of risk and Insurance*, 75(4), 921-946.
- Azman-Saini, W. N. W., & Smith, P. (2011). *Finance and growth: new evidence on the role of insurance.* *South African Journal of Economics*, 79(2), 111-127.
- Beenstock, M., Dickinson, G. and S. Khajuria. (1988). *The Relationship Between Property-Liability Insurance Premiums and Income : an International Analysis.* *Journal of Risk and Insurance*, 55, 259-272.
- Ching, K. S., Kogid, M., & Furuoka, F. (2010). *Causal relation between life insurance funds and economic growth: evidence from Malaysia.* *ASEAN Economic Bulletin*, 27(2), 185-199.
- Dolar, V., & Meh, C. A. (2002). *Financial structure and economic growth: a non-technical survey.* *Bank of Canada.*
- Engle, R. F., & Granger, C. W. (1987). *Co-integration and error correction: representation, estimation, and testing.* *Econometrica. journal of the Econometric Society*, 251-276.
- Han, L., Li, D., Moshirian, F., & Tian, Y. (2010). *Insurance Development and Economic Growth.* *The Geneva Papers on Risk and Insurance-Issues and Practice*, 35(2), 183-199.
- Johansen, S., Juselius, K. (1990). *Maximum likelihood estimation and inference on cointegration with applications to the demand for money.* *Oxf. Bull. Econ.Stat*, 52, 169–210.
- Khadka Arjun Bikram (2020), *Relation between Insurance and Economic Growth in Nepal*, *Rupantaran : A Multidisciplinary Journal*, Vol. IV : pp 11-19
- Kugler, M., & Ofoghi, R. (2005). *Does insurance promote economic growth? Evidence from the UK.* *Money Macro and Finance (MMF) Research Group Conference* 8.
- Lee, C. C. (2011). *Does insurance matter for growth: Empirical evidence from OECD countries.* *The BE Journal of Macroeconomics*, 11 (1).
- Levine, R. (2005). *Finance and growth: theory and evidence.* *Handbook of economic growth*. 1, 865-934.
- Liu, G. C., Lee, C. C., & Lee, C. C. (2015). *The nexus between insurance activity and economic growth: A bootstrap rolling window approach.* *International Review of Economics & Finance*.
- Outreville, J. F. (1990). *The economic significance of insurance markets in developing countries.* *Journal of Risk and Insurance*, 487-498.
- Merghoum, K. Hassani, H. Himrane, M (2018), *The Partnership Between Banks and insurance companies to develop life Insurance in Algeria*, *Revue des reformes economiques et intégration dans l'économie mondiale*, Volume 12, Numéro 26, Pages 116-126
- Peleckienė Valentina, Kęstutis Peleckis, Gitana Dudzevičiūtė & Kęstutis K. Peleckis (2019), *The relationship between insurance and economic growth: evidence from the European Union countries*, *Economic Research-Ekonomska Istraživanja*, 32:1, 1138-1151.
- Pesaran, M. H., Shin, Y., & Smith, R. J. (2001). *Bounds testing approaches to the analysis of level relationships.* *Journal of applied econometrics*, 16 (3), 289-326.
- Pesaran, M. H., Shin, Y., Smith, R.J. (1996). *Testing for the 'Existence of a Long-Run Relationship.* *Department of Applied Economics Working Paper.*
- Phillips, P. C. B., Perron, P. (1988). *Testing for a unit root in time series regression.* *Biometrika*, 75, 335–346.
- Pradhan, R. P., Arvin, B. M., Norman, N. R., Nair, M., & Hall, J. H. (2016). *Insurance penetration and economic growth nexus: Cross-country evidence from ASEAN.* *Research in International Business and Finance*, 36, 447-458.
- Rule, D. (2001). *Risk Transfer between Banks, Insurance Companies and Capital Markets.* *Financial Stability Review* 11, 127-159.
- Ward, D., & Zurbrugg, R. (2000). *Does insurance promote economic growth? Evidence from OECD countries.* *Journal of Risk and Insurance*, 67, 489-506.

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